S O I L S U R V E Y

BLUE RIM AREA

Sublette County, Wyoming

UNITED STATES DEPARTMENT OF AGRICULTURE

Soil Conservation Service

In cooperation with

UNITED STATES DEPARTMENT OF INTERIOR

Bureau of Land Management

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Major field work for this soil survey was done in the period June through October 1972. Soil names and descriptions were approved in 1972. Unless otherwise indicated, statements in the publication refer to conditions in the area in 1972. This survey was made cooperatively by the Soil Conservation Service and the Bureau of Land Management.

HOW TO USE THIS SOIL SURVEY

This soil survey contains information that can be applied in managing rangelands; in selecting sites for roads, ponds, buildings, and other structures; and in judging the suitability of tracts of land for farming, industry, and recreation.

Locating Soils

All the soils of the Blue Rim Area are shown on the soil survey field sheets for this soil survey. The field sheets are aerial photographs, and the number on each sheet corresponds with a number on the Index to Field Sheets.

On each field sheet soil areas are outlined and are identified by symbols. All areas marked with the same symbol contain the same kinds of soils as defined under "Description of Soils." The soil symbol is inside the area if there is enough room; otherwise, it is outside and a pointer shows where the symbol belongs.

Finding and Using Information

The "Guide to Mapping Units" can be used to find information. This guide lists all the mapping units of the survey area by map symbol and gives the capability classification of each. It also shows the page where each soil is described and the range site in which the soil has been placed.

Individual colored maps showing the relative suitability or degree of limitation of soils for many specific purposes can be developed by using the soil map and the information in the text. Translucent material can be used as an overlay over the soil map and colored to show soils that have the same limitation or suitability. For example, soils that have a slight limitation for a given use can be colored green, those with a moderate limitation can be colored yellow, and those with a severe limitation can be colored red.

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SOIL SURVEY OF SUBLETTE COUNTY, WYOMING
BLUE RIM AREA

By James R. Stephens, Jr., Soil Conservation Service[1/]

The Blue Rim Area consists of privately-owned, Federally-owned, and State-owned land located in Sublette County, Wyoming. The northern part of the survey area is about 5 miles south of Boulder, Wyoming, on the south side of the New Fork River.

The area covers about 56,000 acres. The principal use of the lands within the area is rangeland. Other uses include wildlife habitat.

Elevations range from about 6,800 feet along the New Fork River on the western edge of the area to a little over 7,300 feet along the east side of the area. The area is bounded along the north side by Sand Springs Draw and the New Fork River. The east boundary is Highway 187 and the Blue Rim drift fence. The drift fence forms the south boundary and west boundary running up to the Big Piney Highway. In the central part of the west side the soil survey was extended west of the drift fence to the New Fork River. The soil survey was extended beyond the prescribed boundaries in other areas also to map soils and landscapes adjacent to the Blue Rim Area.

The Blue Rim Area is divided into two precipitation zones. These are 7 to 9 inch and 10 to 14 inch precipitation zones. The Blue Rim topographic break forms the boundary between these zones with the 7 to 9 inch area lying north and west of the Rim and the 10 to 14 inch zone lying south and east of the Rim. From the northern end of the Blue Rim break the 10 to 14 inch precipitation zone was extended north and west along Alkali Creek and Sand Springs Draw. The 7 to 9 inch precipitation zone is generally below 7,000 feet elevation, and the 10 to 14 inch zone is above 7,000 feet.

The area above the Blue Rim break is drained by North Alkali Draw leading to the southwest. The drainage in the very southeast corner runs to the southeast. The north part of the area above the Rim is drained by Alkali Creek and Sand Springs Draw running north and west to the New Fork River. The area below the Blue Rim break is drained by numerous intermittent streams and draws to the New Fork River. The New Fork River runs along part of the north and west sides of the Blue Rim Area.

How This Survey Was Made

Soil scientists made this survey to learn what kinds of soil are in the Blue Rim Area, where they are located, and how they can be used. The soil scientists went into the area knowing they likely would find many soils they had already seen and perhaps some they had not. They observed the steepness, length, and shape of slopes, the size and speed of streams, the kinds of native plants, the kinds of rock, and many facts about the soils. They dug many holes to expose soil profiles. A profile is the sequence of natural layers or horizons in a soil; it extends from the surface down into the parent material that has not been changed much by leaching or by the action of plant roots.

1/Halvor B. Ravenholt assisted in the field work. Clarence J. Fowkes and William R. Glenn assisted in the field correlation. All are soil scientists with the Soil Conservation Service.

The soil scientists made comparisons among the profiles they studied, and they compared these profiles with those in counties nearby and in places more distant. They classified and named the soils according to nationwide uniform procedures. The soil series and the soil phase are the categories of soil classification most used in a local survey.

Soils that have profiles almost alike make up a soil series. Except for different texture in the surface layer, all the soils of one series have major horizons that are similar in thickness, arrangement, and other important characteristics. Each soil series is named for a town, geographic feature, or other feature near the place where a soil of that series was first observed and mapped. Bluerim and Vible, for example, are the names of two soil series whose type locations are in the Blue Rim Area. All the soils in the United States having the same series name are essentially alike in those characteristics that affect their behavior in the undisturbed landscape.

Soils of one series can differ in texture of the surface layer and in slope, stoniness, or some other characteristic that affects use of the soils by man. On the basis of such differences a soil series is divided into phases. The name of a soil phase indicates a feature that affects management. For example, the mapping unit Glendive-Havre complex, saline, is composed of saline phases of the Glendive and the Havre series.

After a guide for classifying and naming the soils had been worked out, the soil scientists drew the boundaries of the individual soils, soil associations, complexes, and undifferentiated groups on aerial photographs. These photographs show woodland, drainages, landscape features, and other details that help in drawing boundaries accurately.

The areas shown on the field sheets are called mapping units. In some areas a mapping unit is nearly equivalent because it is not practical to show on such a map all the small, scattered bits of soil of some kind that have been seen within an area that is dominantly of a recognized soil phase. An example is Vible sandy loam.

Most mapping units of this survey area are made up of soils of different series or of different phases within one series. Three such kinds of mapping units are shown on the soil map of the Blue Rim Area--soil complexes, soil associations, and undifferentiated groups.

A soil complex consists of areas of two or more soils so intricately mixed or so small in size that they cannot be shown separately on the soil map. Each area of a complex contains some of each of the two or more dominant soils, and the pattern and relative proportions are about the same in all areas. Generally, the name of a soil complex consists of the names of the dominant soils joined by a hyphen. Laney-Glenderson complex is an example.

A soil association is made up of adjacent soils that occur as areas large enough to be shown individually on the soil map but are shown as one unit because the time and effort of delineating them separately cannot be justified. There is a considerable degree of uniformity in pattern and relative extent of the dominant soils joined by a hyphen. Bluerim-Tigon association is an example.

An undifferentiated group is made up of two or more soils that could be delineated individually but are shown as one unit because, for the purpose of the soil survey, there is little value in separating them. The pattern and proportion of soils are not uniform. An area shown on the map may be made up of only one of the dominant soils or of two or more. If there are two or more dominant series represented in the group, the name of the group ordinarily consists of the names of the dominant soils joined by "and." Bluerim, Abston, and Milren soils, 3 to 15 percent slopes, is an example.

In most areas surveyed there are places where the soil material is so rocky, so shallow, so severely eroded, or so variable that it has not been classified by soil series. These places are shown on the soil map and are described in the survey, but they are called land types and are given descriptive names such as Shale rock land.

While a soil survey is in progress, soil scientists take soil samples needed for laboratory measurements and for engineering tests. Laboratory data from the same kind of soil in other places are also assembled.

Soil scientists observe how soils behave when used as a growing place for native and cultivated plants and as material for structures, foundations for structures, or covering for structures. They relate this behavior to properties of the soils. For example, they observe that filter fields for onsite disposal of sewage fail on a given kind of soil, and they relate this to the slow permeability of the soil or its high water table. They see that streets, road pavements, and foundations for houses are cracked on a named kind of soil; and they relate this failure to the high shrink-swell potential of the soil material. Thus, they use observation and knowledge of soil properties, together with available research data, to predict limitations or suitability of soils for present and potential uses.

After data have been collected and tested for the key, or benchmark, soils in a survey area, the soil scientists set up trial groups of soils. They test these groups by further study and by consultation with agronomists, range conservationists, engineers, and others. They then adjust the groups according to the results of their studies and consultation. Thus, the groups that are finally evolved reflect up-to-date knowledge of the soils and their behavior under current methods of use and management.

DESCRIPTIONS OF THE SOILS

This section describes the soil series and mapping units in the Blue Rim Area. Each soil series is described in detail and then, briefly, each mapping unit in that series. Unless it is specifically mentioned otherwise, it is to be assumed that what is stated about the soil series holds true for the mapping units in that series. Thus, to get full information about any one mapping unit it is necessary to read both the description of the mapping unit and the description of the soil series to which it belongs.

An important part of the description of each soil series is the soil profile; that is, the sequence of layers from the surface downward to rock or other underlying material. Each series contains two descriptions of this profile.

The first is brief and in terms familiar to the layman. The second is much more detailed and is for those who need to make thorough and precise studies of soils. Color terms are for dry soil unless otherwise stated. The profile described in the series is representative for mapping units in that series. If the profile of a given mapping unit is different from the one described for the series, these differences are stated in describing the mapping unit or they are differences that are apparent in the name of the mapping unit.

As mentioned in the section, "How This Survey Was Made," not all mapping units are members of a soil series. Shale rock land, for example, does not belong to a soil series but, nevertheless, is listed in alphabetical order along with the soil series.

Following the name of each mapping unit is a symbol in parentheses. This symbol identifies the mapping unit on the soil map. Listed at the end of each description of a mapping unit is the range site in which the mapping unit has been placed. The page for the description of the mapping unit, the range site, or other interpretative group can be found by referring to the "Guide to Mapping Units" at the back of this survey.

The acreage and proportionate extent of each mapping unit are shown in Table 1. Many of the terms used in describing soils can be found in the Glossary at the end of this survey, and more detailed information about the terminology and methods of soil mapping can be obtained from the Soil Survey Manual (2)[1/].

1/Numbers in parentheses refer to Literature Cited, p.

TABLE I

Approximate Acreage and Proportionate Extent of Mapping Units

Mapping Unit	Soil Name	Acreage	Percent of Area
102	Shale rock land	2,228	3.9
110	Natrargids	616	1.1
112	Rock land-Natrargids complex	816	1.4
113	Salorthids-Natrargids complex	652	1.2
250	Glendive-Havre complex, saline	444	0.8
251	Bluerim-Tigon association	6,700	12.0
252	Tigon-Bluerim association	8,704	14.5
253	Rallod-Onason-Rock outcrop complex, 10 to 30 percent slopes	1,628	2.9
254	Combined with 256	334	0.6
256	Bluerim-Abston and Milren soils, 3 to 15 percent slopes	2,368	3.1
257	Bluerim-Cotha association	3,340	6.0
258	Forelle-Havre association	1,160	2.0
259	Ryark-Relsob complex, 3 to 10 percent slopes	1,208	2.1
260	Ryark-Cothran association	2,716	4.8
261	Coalmont-Bluerim complex, 3 to 15 percent slopes	1,348	2.4
262	Cotha-Ryark complex, 3 to 15 percent slopes	872	1.5
263	Vible sandy loam	504	0.9
264	Fluvents	836	1.4
351	Laney-Glenderson complex	5,856	13.0
352	Fraddle-Ouard complex	952	1.6
354	Fraddle-Littsan association	1,860	3.3
355	Combined with 365	1,228	2.2
356	Koonich-Laney complex	764	1.2
357	Rock land, Huguston, and Youjay soils, 10 to 30 percent slopes	2,928	5.2
359	Rock land-Hatermus complex, 10 to 30 percent slopes	1,000	1.9
360	DeBone-Tresano complex, 6 to 10 percent slopes	1,024	1.9
361	Fraddle-Haterton association	1,900	3.4
365	Littsan-Bodorumpe association	1,876	3.3
	Water	236	.4
Total		56,098	100.0

ABSTON SERIES

The Abston series are well drained soils. They formed in residuum from alkaline shales on hillsides. Slopes are 6 to 15 percent. Elevation is 7,000 to 7,300 feet. Vegetation is big sagebrush, low sagebrush, thickspike wheatgrass, and Sandberg bluegrass. Precipitation is 10 to 12 inches, mean annual air temperature is about 36°F., and the frost-free season is 80 to 90 days.

In a representative profile the surface layer is yellowish brown, neutral sandy loam about 1 inch thick. The subsurface layer is light gray, neutral sandy loam about 2 inches thick. The upper part of the subsoil is brown, mildly alkaline clay about 2 inches thick. The lower part of the subsoil is grayish brown, strongly alkaline to very strongly alkaline clay to sandy clay loam about 12 inches thick. The substratum is brown to light brownish gray, very strongly alkaline sandy clay loam about 17 inches thick. Soft, alkaline, calcareous shale occurs at 34 inches.

The soil is slowly permeable. Available water capacity for the profile is 1.4 to 3.4 inches. Effective rooting depth is 20 to 40 inches. Typically, the soils have many fine, very fine, and medium roots to 5 inches; few fine and medium roots to 10 inches; and very few fine roots to 14 inches.

The Abston soils are used for rangeland and wildlife habitat.

The representative profile is located in the SW¼, SW¼, Sec. 19, T. 30 N., R. 108 W.

A1	0-1 inch	Yellowish brown (10YR 5/4) sandy loam, dark yellowish brown (10YR 4/4) moist; weak fine crumb structure; soft, loose, nonsticky, nonplastic; many micro, very fine, fine, and medium roots; neutral, pH 6.8; abrupt smooth boundary.
A2	1-3 inches	Light gray (10YR 7/1) sandy loam, dark grayish brown (10YR 4/2) moist; vesicular crust; soft, very friable, slightly sticky, slightly plastic; many micro, very fine, fine, and medium roots; neutral, pH 7.0; abrupt smooth boundary.
B21t	3-5 inches	Brown (10YR 5/3) clay, dark brown (10YR 4/3) moist; strong fine columnar parting to strong fine angular blocky structure; hard, firm, sticky, plastic; many very fine, fine, and medium roots; thick continuous waxy coatings on all ped faces; mildly alkaline, pH 7.4; clear wavy boundary.
B22t	5-10 inches	Grayish brown (10YR 5/2) clay, dark grayish brown (10YR 4/2) moist; strong fine prismatic parting to strong fine angular blocky structure; hard, firm, sticky, plastic; few fine and medium roots; thick continuous waxy coatings on all ped faces; strongly alkaline, pH 9.0; clear wavy boundary.

B3	10-17 inches	Grayish brown (10YR 5/2) sandy clay loam, dark grayish brown (10YR 4/2) moist; moderate fine angular blocky structure; hard, firm, sticky, plastic; very few fine roots; thin discontinuous waxy coatings on ped faces; slightly effervescent; very strongly alkaline, pH 9.2; clear wavy boundary.
C1ca	17-28 inches	Brown (10YR 5/3) sandy clay loam, dark grayish brown (10YR 4/2) moist; massive; hard, firm, slightly sticky, slightly plastic; strongly effervescent; many fine seams of secondary lime; very strongly alkaline, pH 9.4; gradual wavy boundary.
C2ca	28-34 inches	Light brownish gray (10YR 6/2) sandy clay loam, dark grayish brown (10YR 4/2) moist; massive; hard, firm, slightly sticky, slightly plastic; strongly effervescent; many medium seams of secondary lime; very strongly alkaline, pH 9.4; gradual wavy boundary.
C3	34 inches	Soft, alkaline, calcareous shale.

Range of Characteristics: Depth to bedrock ranges from 20 to 40 inches and usually occurs at depths of 26 to 36 inches. Depth to carbonates ranges from 10 to 20 inches. Thickness of solum ranges from 15 to 24 inches. Content of gravel ranges from 0 to 5 percent.

The hue of the A horizon is 2.5Y or 10YR. The value is 4 to 7 dry and 3 to 5 moist. The chroma is 1 to 4 dry and moist. The texture is typically sandy loam but may be fine sandy loam or very fine sandy loam. Reaction is neutral or mildly alkaline.

The hue of the B21t and B22t horizons is 2.5Y or 10YR. The value is 5 or 6 dry and 4 or 5 moist. The chroma is 2 or 3 dry and moist.

The hue of the B3 horizon is 2.5Y or 10YR. The value is 4 or 5 dry and 3 or 4 moist. The chroma is 2 or 3 dry and moist. The texture ranges from sandy clay loam to sandy clay. Reaction ranges from strongly alkaline to very strongly alkaline.

The hue of the Cca horizons is 5Y to 10YR. The texture is typically sandy clay loam but may range from very fine sandy loam to sandy clay loam.

The Abston soils are mapped with the Bluerim and Milren soils.

BLUERIM SERIES

The Bluerim series are well drained soils. They formed in residuum from calcareous sandy shale interbedded with arkosic sandstone on hillsides. Slopes are 3 to 20 percent. Elevation is 7,000 to 7,300 feet. Vegetation is big sagebrush thickspike wheatgrass, Sandberg bluegrass, and needleandthread. Precipitation is 10 to 12 inches, and the mean annual air temperature is about 36°F. The growing season is about 80 to 90 days, but frost may occur in any month.

In a representative profile the surface layer is brown, mildly alkaline sandy loam about 3 inches thick. The upper part of the subsoil is brown, mildly alkaline sandy clay loam about 15 inches thick. The lower part of the subsoil is grayish brown, mildly alkaline sandy loam about 6 inches thick. The substratum is light olive brown, moderately alkaline sandy loam about 5 inches thick. Soft, calcareous sandy shale occurs at 29 inches.

The soil is moderately permeable. Available water capacity for the profile is 2.5 to 5.75 inches. Effective rooting depth is 20 to 40 inches. Typically, the soil has many very fine, fine, and medium roots to 3 inches; many fine and medium roots to 12 inches; few medium roots to 18 inches; and very few medium roots to 24 inches.

The Bluerim soils are used for rangeland and wildlife habitat.

The representative profile is located in the NW$\frac{1}{4}$, SE$\frac{1}{4}$, Sec. 3, T. 30 N., R. 108 W.

A1	0-3 inches	Brown (10YR 5/3) sandy loam, dark brown (10YR 3/3) moist; moderate medium and fine crumb structure; soft, very friable, slightly sticky, slightly plastic; many very fine, fine, and medium roots; paving on surface of 15 percent very fine gravel; mildly alkaline, pH 7.4; clear smooth boundary.
B21t	3-12 inches	Brown (10YR 5/3) sandy clay loam, dark brown (10YR 4/3) moist; weak medium prismatic parting to moderate medium angular blocky structure; hard, friable, sticky, plastic; many fine and medium roots; thin nearly continuous waxy coatings on most ped faces; 10 percent very fine gravel; mildly alkaline, pH 7.6; clear smooth boundary.
B22t	12-18 inches	Brown (10YR 5/3) sandy clay loam, dark brown (10YR 4/3) moist; moderate medium angular blocky structure; slightly hard, very friable, slightly sticky, slightly plastic; few medium roots; thin nearly continuous waxy coatings on most ped faces; 10 percent very fine gravel; mildly alkaline, pH 7.6; abrupt smooth boundary.
B3	18-24 inches	Grayish brown (10YR 5/2) sandy loam, dark grayish brown (10YR 4/2) moist; weak medium angular blocky structure; slightly hard, very friable, slightly sticky, nonplastic; very few medium roots; thin patchy waxy coatings on some ped faces; 10 percent very fine gravel; mildly alkaline, pH 7.8; clear smooth boundary.
C1	24-29 inches	Light olive brown (2.5Y 5/4) sandy loam, olive brown (2.5Y 4/4) moist; massive; soft, very friable, slightly sticky, nonplastic; 10 percent very fine gravel; slightly effervescent in spots and seams; moderately alkaline, pH 8.4; gradual wavy boundary.
C2	29 inches	Soft, olive, calcareous sandy shale with seams and nests of secondary lime.

Range of Characteristics: Depth to bedrock ranges from 20 to 40 inches. Depth to calcareous materials ranges from 20 to 30 inches. Thickness of solum ranges from 15 to 28 inches. Content of coarse fragments ranges from 5 to 15 percent and consists of very fine gravel.

The hue of the A1 horizon is 2.5Y or 10YR. The value is 4 or 5 dry and 3 or 4 moist. The chroma is 2 to 4 dry and moist. The texture is typically sandy loam but is fine sandy loam in some pedons. Reaction is neutral or mildly alkaline.

The hue of the B2t horizon is 2.5Y or 10YR. The value is 5 or 6 dry and 4 or 5 moist. The chroma is 3 or 4 dry and moist. The texture is sandy clay loam with 20 to 28 percent clay and more than 35 percent of the sand is fine sand or coarser. Reaction is neutral or mildly alkaline.

The hue of the B3 horizon is 2.5Y or 10YR. The value is 4 to 6 dry and 4 or 5 moist. The chroma is 2 or 3 dry and moist. The texture is sandy loam with the clay content ranging from 12 to about 18 percent. Reaction is mildly alkaline or moderately alkaline.

The hue of the C1 horizon ranges from 5Y to 10YR. The texture ranges from sandy loam to sandy clay loam. Reaction is moderately or strongly alkaline. Very strongly alkaline reactions may occur in the soft shale of the C2 horizons at some locations.

Bluerim-Cotha association (257) - This association consists of about 50 percent Bluerim sandy loam, 6 to 15 percent slopes, and about 25 percent Cotha sandy loam, 6 to 15 percent slopes. The profile of the Bluerim soils is similar to the profile described as representative of the series. The profile of the Cotha soils is the same as the profile described as representative of the series. This unit occupies landscapes consisting of rolling and hilly uplands and a few narrow, rolling ridges. The Bluerim soils occur on concave surfaces and uniform, sloping areas. The Cotha soils occur on rounded or convex surfaces. This mapping unit occurs above the Blue Rim topographic break. Included are about 15 percent Tigon soils, 5 percent Onason soils, and about 5 percent Milren soils.

Runoff is medium to rapid, and erosion hazard is moderate to severe. Wind erosion hazard is severe

This association is used for rangeland and wildlife habitat. Bluerim soils--Loamy, 10 to 14 inch precipitation zone, range site; Cotha soils--Sandy, 10 to 14 inch precipitation zone, range site.

Bluerim-Tigon association (251) - This association consists of about 50 percent Bluerim sandy loam, 6 to 20 percent slopes, and about 30 percent Tigon sandy loam, 6 to 30 percent slopes. The profile of the Bluerim soils is the same as the profile described as representative of the series. The profile of the Tigon soils is similar to the profile described under the series headings. The soils of the association occupy ridges and hillsides. The landscapes are incised by many drainages. The Bluerim soils occur on the hillsides below the ridges. The Tigon soils occupy the ridges and upper sidehills above the Bluerim soils. This mapping unit occurs above the Blue Rim topographic break. Included are about 5 percent soils similar to Bluerim soils but reddish colored; about 5

percent soils similar to Bluerim soils but very strongly alkaline; about 5 percent Abston soils, and about 5 percent Cotha soils.

Runoff is medium to rapid and erosion hazard is moderate to severe. Wind erosion hazard is severe.

This association is used for rangeland and wildlife habitat. Bluerim soils--Loamy, 10 to 14 inch precipitation zone, range site. Tigon soils--Shallow Loamy, 10 to 14 inch precipitation zone, range site.

Bluerim, Abston, and Milren soils, 3 to 15 percent slopes (256) - This undifferentiated unit consists of about 30 percent Bluerim sandy loam, 6 to 15 percent slopes; 25 percent Abston sandy loam, 6 to 15 percent slopes; and about 25 percent Milren sandy loam, 3 to 10 percent slopes. There is considerable variation in composition of the individual areas, and all of the soils may or may not occur in each area. The profile of the Bluerim soils is similar to the profile described under the series headings. The profiles of the Abston and Milren soils are the same as the profiles described as representative for the respective series. The soils of this unit occupy undulating to hilly uplands and sloping alluvial fans. The Bluerim and Abston soils are usually intermingled on the hillsides on the upper portions of the landscapes. The Milren soils usually occur below these soils on alluvial fans. This mapping unit occurs above the Blue Rim topographic break. Included are about 10 percent soils similar to Abston soils with shale at 10 to 20 inches, about 5 percent soils similar to the Bluerim soils with very strongly alkaline reaction in the underlying sandy shale; and about 5 percent soils similar to the Milren soils but lacking very strongly alkaline materials below the subsoil.

Runoff is medium to rapid for Bluerim and Abston soils, and erosion hazard is moderate to severe. Runoff is slow to medium for Milren soils, and erosion hazard is slight to moderate. Wind erosion hazard is severe.

This association is used for rangeland and wildlife habitat. Bluerim soils--Loamy, 10 to 14 inch precipitation zone, range site. Abston soils--Clayey, 10 to 14 inch precipitation zone, range site. Milren soils--Clayey, 10 to 14 inch precipitation zone, range site.

BODORUMPE SERIES

The Bodorumpe series are well drained soils. They formed in wind-deposited sand undulating to hilly uplands. Slopes are 3 to 15 percent. Elevation is 6,700 to 7,000 feet. Vegetation is needleleaf sedge, needleandthread, rubber rabbitbrush, and thickspike wheatgrass. Precipitation is 7 to 9 inches, and the mean annual air temperature is about 36°F. The growing season is about 80 to 90 days, but frost may occur in any month.

In a representative profile the surface layer is pale brown, neutral fine sand about 3 inches thick. The upper part of the underlying layer is pale brown mildly alkaline loamy fine sand about 22 inches thick. The lower part of the underlying layer is grayish brown mildly alkaline fine sand about 11 inches thick. Soft, calcareous, platy shale occurs at 36 inches.

The soil is rapidly permeable. Available water capacity for the profile is 1.2 to 4.0 inches. Effective rooting depth is 20 to 40 inches. Typically, the soil has many very fine and fine roots to 7 inches and a few very fine roots to 36 inches.

The Bodorumpe soils are used for rangeland and wildlife habitat.

Representative profile is located in the NE$\frac{1}{4}$, NE$\frac{1}{4}$, Sec. 2, T. 30 N., R. 109 W.

A1	0-3 inches	Pale brown (10YR 6/3) fine sand, dark grayish brown (10YR 4/2) moist; single grain; loose, nonsticky, nonplastic; neutral, pH 7.2; gradual wavy boundary.
C1	3-25 inches	Pale brown (10YR 6/3) loamy fine sand, dark brown (10YR 4/3) moist; single grain; loose, nonsticky, nonplastic; mildly alkaline, pH 7.4; clear smooth boundary.
C2	25-36 inches	Grayish brown (10YR 5/2) fine sand, dark grayish brown (10YR 4/2) moist; single grain; loose, nonsticky, nonplastic; mildly alkaline, pH 7.6; gradual wavy boundary.
IIC3	36 inches	Soft, calcareous, platy shale; strongly effervescent, pH 8.8

Range of Characteristics: Depth to bedrock ranges from 20 to 40 inches. These soils are usually noncalcareous but some pedons may have carbonates immediately above the underlying shale.

The hue of the A1 horizon is 2.5Y or 10YR. The value is 5 or 6 dry and 4 or 5 moist. The chroma is 2 or 3 dry and moist. The texture ranges from fine sand to loamy fine sand and is typically fine sand. Reaction is neutral or mildly alkaline.

The hue of the C horizon is 2.5Y or 10YR. The value is 4 to 6 dry and 3 or 4 moist. The chroma is 2 or 3 dry and moist. The texture ranges from fine sand to loamy fine sand and is usually a loamy fine sand in the upper part of the C horizon and a fine sand in the lower part of the C horizon. Reaction is neutral or mildly alkaline.

The Bodorumpe soils are mapped in association with the Littsan soils.

COALMONT SERIES

The Coalmont series are well drained soils. They formed in residuum from soft shale on undulating to hilly uplands. Slopes are 3 to 15 percent. Elevation is 7,000 to 7,300 feet. Vegetation is low sagebrush, thickspike wheatgrass, and Sandberg bluegrass. Precipitation is 10 to 12 inches, and the mean annual air temperature is about 36°F. The growing season is about 80 to 90 days, but frost may occur in any month.

In the representative profile the surface layer is brown, neutral fine sandy loam about 2 inches thick. The subsurface layer is light brownish gray, neutral

sandy loam about 2 inches thick. The subsoil is about 20 inches thick. In sequence from the top the upper 5 inches is brown, neutral silty clay; the next 5 inches is brown, mildly alkaline clay loam; the next 7 inches is pinkish gray, strongly alkaline clay loam; and the lower 3 inches is brown, strongly alkaline clay loam. It is underlain by soft, calcareous shale at a depth of 24 inches.

Permeability is slow. Available water capacity for the profile is 3.5 to 8.25 inches. Effective rooting depth is 20 to 40 inches. Typically, the soil has abundant fine and very fine roots to 4 inches, plentiful fine and very fine roots to 9 inches, and few fine and very fine roots to 21 inches. Few coarse roots extend to depths of 24 inches.

The Coalmont soils are used for rangeland and wildlife habitat.

The representative profile is located in the SE$\frac{1}{4}$, NW$\frac{1}{4}$, Sec. 24, T. 31 N., R. 109 W.

A1	0-2 inches	Brown (10YR 5/3) fine sandy loam, dark brown (10YR 4/3) moist; weak fine crumb structure; soft, very friable, nonsticky, nonplastic; many fine and very fine roots; neutral, pH 7.2; clear smooth boundary.
A2	2-4 inches	Light brownish gray (10YR 6/2) sandy loam, dark grayish brown (10YR 4/2) moist; weak fine subangular blocky structure; soft, very friable, nonsticky, nonplastic; many fine and very fine roots; neutral, pH 6.8; abrupt smooth boundary.
B21t	4-9 inches	Brown (7.5YR 5/2) silty clay, dark brown (7.5YR 4/2) moist; strong fine columnar parting to strong fine angular blocky structure; extremely hard, extremely firm, very sticky, plastic; many very fine and fine roots; thick continuous waxy coatings on all ped faces; neutral, pH 7.2; clear smooth boundary.
B22t	9-14 inches	Brown (7.5YR 5/2) clay loam, dark brown (2.5YR 4/2) moist; strong fine prismatic parting to strong fine angular blocky structure; extremely hard, very firm, sticky, plastic; few very fine, fine, and coarse roots; thick continuous waxy coatings on all ped faces; mildly alkaline, pH 7.6; clear smooth boundary.
B23tca	14-21 inches	Pinkish gray (7.5YR 6/2) clay loam, brown (7.5YR 5/2) moist; moderate fine prismatic parting to strong fine angular blocky structure; hard, firm, sticky, plastic; few very fine, fine, and coarse roots; thick nearly continuous waxy coatings on all ped faces; effervescent, many seams and nests of secondary lime; strongly alkaline, pH 8.6; clear smooth boundary.
B3ca	21-24 inches	Brown (7.5YR 5/2) and pockets of grayish brown (2.5Y 5/2) clay loam, dark brown (10YR 4/3) moist; moderate fine

angular blocky structure; slightly hard, firm, sticky, plastic; few coarse roots; effervescent, many seams and soft masses of secondary lime; strongly alkaline, pH 9.0; gradual wavy boundary.

C 24 inches Olive, calcareous, soft shale.

Range of Characteristics: Depth to bedrock ranges from 20 to 40 inches. Depth to calcareous materials ranges from 12 to 24 inches. Thickness of the solum ranges from 18 to 24 inches. Content of coarse fragments is 0 to 5 percent and consists of small shale fragments.

The hue of the A1 horizon is 2.5Y or 10YR. The value is 4 or 5 dry and 3 or 4 moist. The chroma is 2 or 3 dry and moist. Texture is typically fine sandy loam but may be very fine sandy loam. Reaction is neutral to mildly alkaline.

The hue of the B2t horizons ranges from 2.5Y to 7.5YR. The value is 4 or 5 dry and 4 or 5 moist. The chroma is 2 or 3 dry and moist. The texture ranges from clay loam to silty clay with about 38 to 45 percent clay content. Reaction is neutral to mildly alkaline.

The B23tca horizon and the B3ca horizon range in hue from 2.5Y to 7.5YR. The texture is typically clay loam with the clay content ranging from 30 to about 35 percent. Reaction is mildly alkaline to strongly alkaline.

Coalmont-Bluerim complex, 3 to 15 percent slopes (261) - This complex consists of about 40 percent Coalmont fine sandy loam, 3 to 15 percent slopes, and about 30 percent Bluerim sandy loam, 3 to 15 percent slopes. The profile of the Coalmont soils is the same as the profile described as representative of the series. The profile of the Bluerim soils is similar to the profile described under the series headings. The soils of this complex developed on rounded ridges and smooth hillsides in areas where the bedrocks are quite complex. The bedrocks usually are shale or sandy shale. The Coalmont and Bluerim soils occur in a complex pattern throughout the landscapes. The Coalmont soils occur where the bedrocks are clay shales. The Bluerim soils occur over sandstone or sandy shale bedrocks. This mapping unit occurs above the Blue Rim topographic break. Included are about 15 percent Abston soils, about 10 percent thin alkaline soils, and about 5 percent Tigon soils.

Runoff is medium to rapid and erosion hazard is moderate to severe. Wind erosion hazard is severe.

This complex is used for rangeland and wildlife habitat. Coalmont soils--Clayey, 10 to 14 inch precipitation zone, range site. Bluerim soils--Loamy, 10 to 14 inch precipitation zone, range site.

COTHA SERIES

The Cotha series are well drained soils. They formed in residuum from sandstone undulating to hilly uplands. Slopes are 3 to 15 percent. Elevation is 7,000 to 7,300 feet. Vegetation is needleandthread, big sagebrush, and thickspike wheatgrass. Precipitation is 10 to 12 inches, and the mean annual air temperature is

about 36°F. The growing season is about 80 to 90 days, but frost may occur in any month.

In the representative profile the surface layer is pale brown, neutral sandy loam about 4 inches thick. The upper part of the subsoil is brown to yellowish brown neutral sandy loam about 24 inches thick. The substratum is light yellowish brown neutral sandy loam about 6 inches thick. Soft, noncalcareous sandstone occurs at 34 inches.

Permeability is moderately rapid. Available water capacity for the profile is 2.25 to 5.25 inches. Effective rooting depth is 20 to 40 inches. Typically, the soil has many fine, very fine, and medium roots to 11 inches; few fine roots to 18 inches; and few very fine roots to 28 inches.

The Cotha soils are used for rangeland and wildlife habitat.

The representative profile is located near the center of Sec. 23, T. 31 N., R. 109 W.

A1	0-4 inches	Pale brown (10YR 6/3) sandy loam, dark brown (10YR 4/3) moist; weak fine crumb structure; loose, very friable, nonsticky, nonplastic; many very fine, fine, and medium roots; neutral, pH 6.8; clear smooth boundary.
B21t	4-11 inches	Brown (10YR 5/3) sandy loam, dark brown (10YR 4/3) moist; weak medium prismatic parting to weak medium angular blocky structure; slightly hard, friable, slightly sticky, slightly plastic; many very fine, fine, and medium roots; thin discontinuous waxy coatings on some ped faces; neutral, pH 6.8; clear smooth boundary.
B22t	11-18 inches	Brown (10YR 5/3) sandy loam, dark brown (10YR 4/3) moist; weak medium prismatic parting to moderate medium angular blocky structure; slightly hard, friable, slightly sticky, slightly plastic; few fine roots; thin discontinuous waxy coatings on some ped faces and clay bridging between sand grains; neutral, pH 7.0; clear smooth boundary.
B3	18-28 inches	Yellowish brown (10YR 5/4) sandy loam, dark yellowish brown (10YR 4/4) moist; weak medium angular blocky structure; soft, friable, slightly sticky, slightly plastic; very few fine roots; thin discontinuous waxy coatings in root channels and some clay bridging between sand grains; neutral, pH 7.0; gradual wavy boundary.
C1	28-34 inches	Light yellowish brown (10YR 6/4) sandy loam, yellowish brown (10YR 5/4) moist; massive; soft, very friable, nonsticky, nonplastic; neutral, pH 7.2; gradual wavy boundary.
C2	34 inches	Light yellowish brown, soft, noncalcareous, fine grained sandstone; few seams of calcium carbonate.

Range in Characteristics: Depth to bedrock ranges from 20 to 40 inches. The soils are noncalcareous throughout, although there may be a few seams of calcium carbonate in the underlying sandstone. Thickness of solum ranges from 16 to 30 inches. Content of coarse fragments ranges from 5 to 15 percent and is usually about 10 percent, consisting of one-fourth to one-half inch sandstone fragments.

The hue of the A1 horizon is 2.5Y or 10YR. The value is 5 or 6 dry and 3 or 4 moist. The chroma is 2 or 3 dry and moist. The texture is typically sandy loam but may be fine sandy loam in some pedons. Reaction is neutral or mildly alkaline.

The hue of the B2t horizon is 2.5Y or 10YR. The value is 5 or 6 dry and 4 or 5 moist. The chroma is 2 or 3 dry and moist. The texture is sandy loam ranging in clay content from 10 to about 16 percent. Reaction is neutral or mildly alkaline.

The hue of the B3 horizon is 2.5Y or 10YR. The value is 4 or 5 dry and 3 or 4 moist. The chroma is 3 or 4 dry and moist. The texture is usually a sandy loam but may be fine sandy loam in some pedons. Reaction is neutral or mildly alkaline.

The hue of the C1 horizon is 2.5Y or 10YR. Reaction ranges from neutral to mildly alkaline.

Cotha-Ryark complex, 3 to 15 percent slopes (262) - This complex consists of about 40 percent Cotha sandy loam, 3 to 15 percent slopes; about 25 percent Ryark loamy sand, 3 to 6 percent slopes; and about 20 percent Bluerim sandy loam, 3 to 15 percent slopes. The profiles of the Ryark soils and the Bluerim soils are similar to the profiles described under the respective series headings. These soils are intermingled in the landscapes. The underlying bedrock from which the soils are formed does not occur at uniform depths and evidently undulates. The undulating characteristic of the bedrock allows for the development of moderately deep and deep soils in the same landscape configuration. This mapping unit occurs above the topographic break of the Blue Rim but extends to the northwest toward the Newfork River from the northern end of the Blue Rim. Included are about 10 percent Relsob and about 5 percent Tigon soils. In some areas there are small areas of alkaline soils and small areas of reddish colored soils.

Runoff is slow to rapid and erosion hazard is moderate to severe. Wind erosion hazard is severe.

This complex is used for rangeland and wildlife habitat. Cotha and Ryark soils--Sandy, 10 to 14 inch precipitation zone, range site. Bluerim soils--Loamy, 10 to 14 inch precipitation zone, range site.

COTHRAN SERIES

The Cothran series are well drained soils. They formed in wind-deposited sands on uplands. Slopes are 3 to 6 percent. Elevation is 7,000 to 7,300 feet. Vegetation is low rabbitbrush, needleandthread, and thickspike wheatgrass. Precipitation is 10 to 12 inches, and the mean annual air temperature is about 36°F. The growing season is about 80 to 90 days, and frost may occur in any month.

In a representative profile the surface layer is pale brown, neutral fine sand about two inches thick. The underlying layer is grayish brown to brown, neutral loamy fine sand to neutral fine sand to 60 inches or more.

The soil is rapidly permeable. Available water capacity for the profile is 3.0 to 5.0 inches. Effective rooting depth is 60 inches or more. Typically, the soil has many fine and very fine and few coarse roots to 4 inches, few fine and very fine roots to 12 inches, and very few very fine roots to 28 inches.

The Cothran soils are used for rangeland and wildlife habitat.

The representative profile is located in the southeast quarter of the NE$\frac{1}{4}$ of Sec. 28, T. 31 N., R. 108 W.

A1	0-2 inches	Pale brown (10YR 6/3) fine sand, dark brown (10YR 4/3) moist; single grain; loose, nonsticky, nonplastic; many very fine and fine and few coarse roots; neutral, pH 6.6; clear smooth boundary.
C1	2-28 inches	Grayish brown (10YR 5/2) loamy fine sand, dark grayish brown (10YR 4/2) moist; single grain; loose, nonsticky, nonplastic; many very fine and fine and few coarse roots to four inches, few very fine and fine roots to twelve inches, very few very fine roots to 28 inches; neutral, pH 6.8; gradual wavy boundary.
C2	28-60 inches	Brown (10YR 5/3) fine sand, dark brown (10YR 4/3) moist; single grain; loose, nonsticky, nonplastic; neutral, pH 6.8.

Range in Characteristics: These soils are usually noncalcareous throughout but may in some areas have weakly calcareous materials below depths of 48 to 50 inches. Content of coarse fragments ranges from 0 to 10 percent and consists of one-half inch sandstone fragments.

The hue of the A1 horizon is 2.5Y or 10YR. The value is 5 or 6 dry and 4 or 5 moist. The chroma is 3 or 4 dry and moist. The texture is typically a fine sand but may range to loamy fine sand. Reaction is slightly acid to neutral.

The C horizons range in hue from 2.5Y to 7.5YR. The value is 4 to 6 dry and 4 or 5 moist. The chroma is 2 or 3 dry and moist. These horizons may be thickly stratified fine sand to loamy fine sand. Reaction is neutral or mildly alkaline.

The Cothran soils are mapped with the Ryark soils.

DEBONE SERIES

The DeBone series are well drained soils. They formed in alluvium from alkaline shales on alluvial fans. Slopes are 6 to 10 percent. Elevation is 6,800 to 7,000 feet. Vegetation is big sagebrush, thickspike wheatgrass, Sandberg

bluegrass, and low rabbitbrush. Precipitation is 7 to 9 inches, and the mean annual air temperature is about 36°F. The growing season is about 80 to 90 days, but frost may occur in any month.

In a representative profile the surface layer is brown, mildly alkaline sandy loam to fine sandy loam about 8 inches thick. The subsurface layer is pinkish gray, neutral sandy loam about 2 inches thick. The upper part of the subsoil is brown, strongly alkaline sandy clay about 6 inches thick. The lower part of the subsoil is brown, very strongly alkaline sandy clay loam about 8 inches thick. The substratum is light brownish gray, very strongly alkaline sandy clay loam to 60 inches or more.

The soil is moderately slow to slowly permeable. Available water capacity for the profile is 3.5 to 6.5 inches. Effective rooting depth is 40 to 60 inches or more. Typically, the soil has many fine and medium and a few coarse roots to 8 inches, few fine, medium, and coarse roots to 16 inches, and very few medium roots to 24 inches.

The DeBone soils are used for rangeland and wildlife habitat.

The representative profile is located in the SE¼, SW¼, Sec. 24, T. 30 N., R. 109 W.

A11	0-2 inches	Brown (10YR 5/3) sandy loam, dark grayish brown (10YR 4/2) moist; weak medium crumb structure; soft, very friable, slightly sticky, slightly plastic; many fine and medium and few coarse roots; mildly alkaline, pH 7.4; clear smooth boundary.
A12	2-8 inches	Brown (10YR 5/3) fine sandy loam, dark brown (10YR 4/3) moist; weak coarse crumb structure; soft, very friable, slightly sticky, slightly plastic; many fine and medium and few coarse roots; mildly alkaline, pH 7.6; clear smooth boundary.
A2	8-10 inches	Pinkish gray (7.5YR 6/2) sandy loam, dark brown (7.5YR 4/2) moist; massive; slightly hard, very friable, slightly sticky, slightly plastic; few fine medium and coarse roots; neutral, pH 7.2; abrupt smooth boundary.
B21t	10-16 inches	Brown (7.5YR 5/2) sandy clay, dark brown (7.5YR 4/2) moist; moderate medium columnar parting to moderate medium angular blocky structure; very hard, firm, sticky, plastic; few fine medium and coarse roots; thick continuous waxy coatings on all ped faces; strongly alkaline, pH 9.0; clear smooth boundary.
B22t	16-24 inches	Brown (10YR 5/3) sandy clay loam, dark brown (10YR 4/3) moist; moderate medium prismatic parting to moderate medium angular blocky structure; very hard, firm, sticky, plastic; very few medium roots; thick nearly continuous waxy coatings on all ped faces; slightly effervescent in seams; very strongly alkaline, pH 9.4; clear smooth boundary.

C1ca 24-60 inches Light brownish gray (10YR 6/2) sandy clay loam, dark grayish brown (10YR 4/2) moist; massive; hard, firm, sticky, plastic; violently effervescent, many fine threads of secondary lime; very strongly alkaline, pH 9.4.

Range in Characteristics: Depth to calcareous materials usually ranges from 8 to 20 inches, but some profiles may be calcareous to the surface. The thickness of solum ranges from 16 to 30 inches. Content of gravel is 0 to 5 percent. Exchangeable sodium percentage exceeds 15 percent in part of or all of the B2t horizons and the Cca horizons.

The hue of the A horizon is 2.5Y or 10YR. The value is 4 to 6 dry and 4 or 5 moist. The chroma is 2 or 3 dry and moist. The texture is typically a sandy loam but may be fine sandy loam. Reaction is neutral or mildly alkaline.

The hue of the B2t horizons is 2.5Y to 7.5YR. The value is 4 or 5 dry and 4 or 5 moist. The chroma is 2 or 3 dry and moist. The texture ranges from sandy clay loam to sandy clay. The clay content of the upper part of the B2t horizon generally exceeds 40 percent. The clay content of the lower part of the B2t horizon usually ranges from 32 to 36 percent. Reaction is strongly alkaline or very strongly alkaline and usually increases with depth.

The hue of the C horizon is 2.5Y to 10YR. The texture is fine sandy loam to sandy clay loam. Reaction is strongly alkaline or very strongly alkaline.

DeBone-Tresano complex, 6 to 10 percent slopes (360) - This complex consists of about 45 percent DeBone sandy loam, 6 to 10 percent slopes, and about 25 percent Tresano sandy loam, 6 to 10 percent slopes. The profiles of these soils are the same as the profiles described under the respective series headings. This complex occupies rolling alluvial fans, usually between ridges adjacent to foothills. The DeBone and Tresano soils are intermingled in the landscape. This mapping unit occurs below the Blue Rim topographic break. Included are about 10 percent Laney soils, about 10 percent Fraddle soils, about 5 percent Youjay soils, and about 5 percent barren alkali areas.

Runoff is medium to rapid and the erosion hazard is moderate to severe. Wind erosion hazard is severe.

This complex is used for rangeland and wildlife habitat. DeBone soils--Loamy (7 to 9 inch precipitation zone), rangesite. Tresano soils--Loamy (7 to 9 inch precipitation zone), rangesite.

Fluvents (264) - This mapping unit consists of about 60 percent moderately well drained loamy sand and sandy loam alluvial soils and about 25 percent poorly drained silt loam and sandy loam alluvial soils. These soils occur on the floodplain of the Newfork River. The moderately well drained soils occupy the higher areas of the floodplain and have water tables at depths of 3 to 5 feet. The vegetation is western wheatgrass and big sagebrush. The poorly drained soils occupy the low bottoms, oxbows, and old stream meanders. The vegetation is sedges, redtop, and trees. Included is a total of about 15 percent riverwash and stream channels.

Runoff is slow and erosion hazard is slight.

This unit is used for rangeland, wildlife habitat, and recreation. Due to the complexity of the unit, no rangesite is assigned.

FORELLE SERIES

The Forelle series are well drained soils. They formed in alluvium and slope wash on alluvial fans. Slopes are 0 to 3 percent. Elevation is 7,000 to 7,300 feet. Vegetation is big sagebrush, thickspike wheatgrass, and Canby bluegrass. The precipitation is 10 to 12 inches, and the mean annual air temperature is about 36°F. The growing season is about 80 to 90 days, but frost may occur in any month.

In a representative profile the surface layer is grayish brown to brown, neutral to mildly alkaline clay loam about 4 inches thick. The upper part of the subsoil is brown, mildly alkaline sandy clay loam about 22 inches thick. The lower part of the subsoil is brown, strongly alkaline sandy clay loam about 6 inches thick. The substratum is brown, strongly alkaline clay loam to 60 inches or more.

The soil is moderately permeable. Available water capacity for the profile is 9.75 to 11.0 inches. Effective rooting depth is 60 inches or more. Typically, the soil has many fine and medium roots to 4 inches, many fine and medium roots and few coarse roots to 16 inches, and a few coarse roots to 26 inches.

The Forelle soils are used for rangeland and wildlife habitat.

The representative profile is located in SE¼, SW¼, Sec. 29, T. 30 N., R. 108 W.

A11	0-2 inches	Grayish brown (10YR 5/2) clay loam, dark brown (7.5YR 4/2) moist; weak medium crumb structure; slightly hard, firm, sticky, plastic; many medium and fine roots; neutral, pH 7.2; clear smooth boundary.
A12	2-4 inches	Brown (10YR 5/3) clay loam, dark brown (7.5YR 4/2) moist; massive; slightly hard, firm, sticky, plastic; many fine and medium roots; mildly alkaline, pH 7.2; clear smooth boundary.
B21t	4-16 inches	Brown (7.5YR 5/2) sandy clay loam, dark brown (7.5YR 4/2) moist; moderate medium prismatic parting to strong medium angular blocky structure; very hard, very firm, very sticky, plastic; many fine and medium and few coarse roots; thick continuous waxy coatings on all ped faces; mildly alkaline, pH 7.4; clear smooth boundary.
B22t	16-26 inches	Brown (7.5YR 5/2) sandy clay loam, dark brown (7.5YR 4/2) moist; moderate fine prismatic parting to strong fine angular blocky structure; very hard, very firm, very sticky, plastic; few coarse roots; mildly alkaline, pH 7.6; clear smooth boundary.
B3ca	26-32 inches	Brown (7.5YR 5/2) sandy clay loam, dark brown (7.5YR 4/2) moist; moderate medium angular blocky structure; hard, firm, sticky, plastic; thin discontinuous waxy coatings on vertical ped faces; slightly effervescent, few fine nests and seams

of calcium carbonate; strongly alkaline, pH 8.6; gradual wavy boundary.

Cca	32-60 inches	Brown (7.5YR 5/2) clay loam, dark brown (7.5YR 4/2) moist; massive; hard, firm, sticky, plastic; violently effervescent, many fine and medium seams and soft masses of calcium carbonate; strongly alkaline, pH 8.6.

Range in Characteristics: Depth to calcareous materials ranges from 16 to 30 inches. Content of gravel is 0 to 5 percent. Thickness of solum ranges from 16 to 36 inches.

The hue of the A horizon is 2.5Y or 10YR. The value is 4 or 5 dry and 3 or 4 moist. The chroma is 2 or 3 dry and moist. The texture is typically a clay loam but may range from silt loam to silty clay loam. Reaction is neutral or mildly alkaline.

The hue of the B2t horizons is 10YR or 7.5YR. The value is 4 or 5 dry and 4 or 5 moist. The chroma is 2 or 3 dry and moist. The texture is a sandy clay loam with a clay content of from about 28 to 34 percent. Reaction is neutral or mildly alkaline.

The hue of the B3ca horizon is 10YR or 7.5YR. The value is 5 or 6 dry and 4 or 5 moist. The chroma is 2 to 4 dry and moist. The texture is a sandy clay loam of about 30 percent clay. Reaction is moderately alkaline or strongly alkaline and few to many seams of secondary calcium carbonate are evident.

The hue of the Cca horizon is 2.5Y to 7.5YR. The texture ranges from fine sandy loam to clay loam. Reaction is moderately alkaline or strongly alkaline.

Forelle-Havre association (258) - This association consists of about 50 percent Forelle clay loam, 0 to 3 percent slopes, and about 30 percent Havre loam, 0 to 3 percent slopes. The profile of the Forelle soils is the same as the profile described as representative for the series. The profile of the Havre soils is similar to the profile described under the respective series headings. This association occupies nearly level floodplains and alluvial fans. The landscapes occur as narrow, meandering areas several miles long and from 100 feet to 1/8 of a mile wide. The Forelle soils occur on the alluvial fans positions adjacent to the uplands. The Havre soils occur on the narrow floodplains adjacent to intermittent stream channels. The principal area of this mapping unit is located along North Alkali Draw above the Blue Rim topographic break. Included are about 10 percent Glendive soils, about 5 percent Bluerim soils, and about 5 percent soils similar to the Forelle soils but having fine textured subsoils. In some areas the Bluerim soils make up 10 to 20 percent of the unit.

Runoff is slow and erosion hazard is slight.

This association is used for rangeland and wildlife habitat. Forelle soils--Loamy (10 to 14 inch precipitation zone) rangesite; Havre soils--Overflow (10 to 14 inch precipitation zone) rangesite.

FRADDLE SERIES

The Fraddle series are well drained soils. They formed in residuum from soft sandstone on uplands. Slopes are 3 to 20 percent. Elevation is 6,800 to 7,000 feet. Vegetation is big sagebrush, thickspike wheatgrass, and needleandthread. Precipitation is 7 to 9 inches, and the mean annual air temperature is about 36°F. The growing season is about 80 to 90 days, but frost may occur in any month.

In the representative profile the surface layer is pale brown, neutral sandy loam about 4 inches thick. The upper part of the subsoil is light yellowish brown, mildly alkaline sandy clay loam about 8 inches thick. The lower part of the subsoil is light olive brown, mildly alkaline sandy clay loam about 10 inches thick. The substratum is light yellowish brown, mildly alkaline sandy loam about 11 inches thick. Soft sandstone occurs at 33 inches.

The soil is moderately permeable. Available water capacity for the profile is 2.25 to 6.0 inches. Effective rooting depth is 20 to 40 inches. Typically, the soil has few very fine roots to 4 inches, many very fine roots to 12 inches, and few very fine roots to 22 inches.

The Fraddle soils are used for rangeland and wildlife habitat.

Representative profile is located in the SW¼, SW¼, Sec. 29, T. 31 N., R. 108 W.

A11	0-1 inch	Pale brown (10YR 6/3) sandy loam, dark brown (10YR 4/3) moist; vesicular crust; soft, very friable, slightly sticky, slightly plastic; few very fine roots; neutral, pH 6.8; abrupt wavy boundary.
A12	1-4 inches	Pale brown (10YR 6/3) sandy loam, dark brown (10YR 4/3) moist; weak medium subangular blocky structure; soft, very friable, slightly sticky, slightly plastic; many very fine roots; neutral, pH 6.8; clear wavy boundary.
B2t	4-12 inches	Light yellowish brown (10YR 6/4) sandy clay loam, dark yellowish brown (10YR 4/4) moist; moderate coarse prismatic parting to moderate medium subangular blocky structure; slightly hard, friable, sticky, slightly plastic; many very fine and fine roots; mildly alkaline, pH 7.6; clear wavy boundary.
B3	12-22 inches	Light olive brown (2.5Y 5/4) sandy clay loam, olive brown (2.5Y 4/4) moist; weak coarse prismatic parting to weak medium subangular blocky structure; slightly hard, friable, sticky, slightly plastic; few very fine and fine roots; mildly alkaline, pH 7.6; gradual wavy boundary.
C1	22-33 inches	Light yellowish brown (2.5Y 6/4) sandy loam, olive brown (2.5Y 4/4) moist; massive; soft, very friable, slightly sticky, slightly plastic; mildly alkaline, pH 7.6; gradual wavy boundary.
C2	33 inches	Soft sandstone with some thin seams of lime.

Range in Characteristics: Depth to bedrock ranges from 20 to 40 inches. These soils are usually noncalcareous throughout but a few pedons are weakly calcareous in the lower part of the C horizon or have thin seams of lime in the underlying sandstone. Thickness of solum ranges from 16 to 28 inches. The content of coarse fragments ranges from 0 to 5 percent and consists of one-half inch angular sandstone fragments.

The hue of the A1 horizons is 2.5Y or 10YR. The value is 5 or 6 dry and 3 or 4 moist. The chroma is 2 or 3 dry and moist. The texture is typically a sandy loam but may be fine sandy loam. Reaction is neutral or mildly alkaline.

The hue of the B2t horizon is 2.5Y or 10YR. The value is 5 or 6 dry and 4 or 5 moist. The chroma is 3 or 4 dry and moist. The texture is a sandy clay loam of 20 to 28 percent clay, and more than 35 percent of the sand is fine sand or coarser. Reaction is neutral or mildly alkaline.

The hue of the B3 horizon is 2.5Y or 10YR. The value is 4 to 6 dry and 4 or 5 moist. The chroma is 3 or 4 dry and moist. The texture is typically sandy clay loam but may range from sandy clay loam to sandy loam. Reaction is neutral or mildly alkaline.

The hue of the C horizon is 5Y to 10YR. The texture is sandy loam to sandy clay loam. The reaction is mildly alkaline or moderately alkaline. In some profiles the lower part of the C horizon is calcareous.

Fraddle-Haterton association (361) - This association consists of about 40 percent Fraddle sandy loam, 3 to 20 percent slopes, about 25 percent Haterton fine sandy loam, 10 to 30 percent slopes, and about 20 percent Hatermus loam, 10 to 30 percent slopes. The profile of the Fraddle soils is similar to the profile described under the series headings. The profiles of the Haterton and Hatermus soils are the same as the profiles described as representative of the series. The landscapes consist of narrow, winding ridges and sidehills. The Fraddle soils occur on lower sidehills. The Haterton and Hatermus soils are intermingled on ridges and upper slopes of hillsides. This association occurs below the Blue Rim topographic break, primarily in the north central part of the area. Included are a total of about 10 percent Ouard and Youjay soils and about 5 percent Littsan soils. In section 29 of T. 31 N., R. 108 W., there are areas of this association with as much as 15 percent inclusion of a moderately deep loam soil with a weakly defined subsoil. Runoff is moderate to rapid for Fraddle soils, and erosion hazard is moderate to severe.

Runoff is rapid on Haterton and Hatermus soils, and erosion hazard is severe. Wind erosion hazard is severe on the Fraddle soils and Haterton soils.

This association is used for rangeland and wildlife habitat.

Fraddle soils--Loamy (7 to 9 inch precipitation zone) rangesite; Haterton and Hatermus soils--Shallow Loamy (7 to 9 inch precipitation zone) rangesite.

Fraddle-Littsan association (354) - This association consists of about 50 percent Fraddle sandy loam, 3 to 10 percent slopes, and about 25 percent Littsan fine sandy loam, 3 to 10 percent slopes. The profiles of these soils are similar to the profiles described under the respective series headings. The

landscapes consist of a series of low ridges and undulating to rolling sidehills. The Fraddle soils occur on the lower sidehills. The Littsan soils occur on low ridges and upper sidehills. This association occurs below the Blue Rim topographic break along the Big Piney highway. Included are about 15 percent Bodorumpe soils, about 5 percent Haterton soils, and a total of about 5 percent Ouard and Youjay soils.

Runoff is slow to medium, and erosion hazard is slight to moderate. Wind erosion hazard is severe.

This association is used for rangeland and wildlife habitat. Fraddle soils--Loamy (7 to 9 inch precipitation zone) rangesite; Littsan soils--Sandy (7 to 9 inch precipitation zone) rangesite.

Fraddle-Ouard complex (352) - This complex consists of about 40 percent Fraddle sandy loam, 3 to 10 percent slopes, about 20 percent Ouard sandy loam, 3 to 10 percent slopes, and about 20 percent Youjay sandy loam, 3 to 10 percent slopes. The profiles of these soils are the same as the profiles described under the respective series headings. This complex occupies undulating to rolling uplands consisting of low ridges and sidehills, and the soils occur in a highly intermingled pattern. This mapping unit occurs below the Blue Rim topographic break, primarily north of the Big Piney highway. Included are about 10 percent Hatermus soils, about 5 percent Haterton soils, and about 5 percent barren alkali spots.

Runoff is slow to medium. Erosion hazard is slight to moderate. Wind erosion hazard is severe.

This complex is used for rangeland and wildlife habitat. Fraddle soils--Loamy (7 to 9 inch precipitation zone) rangesite. Ouard soils--Shallow Loamy (7 to 9 inch precipitation zone) rangesite. Youjay soils--Shallow Clayey (7 to 9 inch precipitation zone) rangesite.

GLENDERSON SERIES

The Glenderson series are well drained soils. They formed in alluvium derived locally from very strongly alkaline, interbedded sandstone, and shale on alluvial fans. Slopes are 0 to 3 percent. Elevation is 6,800 to 7,000 feet. Vegetation is big sagebrush, Gardner saltbush, needleleaf sedge, and thickspike wheatgrass. Precipitation is 7 to 9 inches, and the mean annual air temperature is about 36°F. The growing season is about 80 to 90 days, but frost may occur in any month.

In the representative profile the surface layer is light brownish gray, moderately alkaline sandy loam about 6 inches thick. The upper part of the underlying layer is light olive gray to light olive brown, very strongly alkaline sandy loam stratified with thin lenses of loam underlain by very strongly alkaline, very fine sandy loam or loam to 60 inches or more.

The soil is moderately permeable. Available water capacity for the profile is 3.5 to 5.0 inches. Effective rooting depth is 60 inches or more. Typically, the soil has many fine, medium, and coarse roots to 6 inches, few fine and medium roots to 12 inches, and very few roots below 12 inches.

The Glenderson soils are used for rangeland and wildlife habitat.

The representative profile is located in the NE¼, SW¼, Sec. 33, T. 31 N., R. 108 W.

A1	0-6 inches	Light brownish gray (2.5Y 6/2) sandy loam, grayish brown (2.5Y 5/2) moist; weak coarse crumb structure; soft, very friable, slightly sticky, slightly plastic; many fine and medium coarse roots; slightly effervescent; moderately alkaline, pH 8.4; clear smooth boundary.
C1	6-12 inches	Light olive gray (5Y 6/2) sandy loam, olive gray (5Y 4/2) moist; massive; soft, very friable, slightly sticky, slightly plastic; few fine and medium roots; slightly effervescent; very strongly alkaline, pH 9.4; clear smooth boundary.
C2	12-38 inches	Light olive brown (2.5Y 5/4) sandy loam stratified with thin lenses of loam, olive brown (2.5Y 4/3) moist; massive; soft, very friable, slightly sticky, slightly plastic; very few roots; slightly effervescent; very strongly alkaline, pH 9.6; clear smooth boundary.
C3	38-48 inches	Light olive gray (5Y 6/2) very fine sandy loam, olive gray (5Y 4/2) moist; massive; soft, very friable, slightly sticky, slightly plastic; slightly effervescent; very strongly alkaline, pH 9.6; clear smooth boundary.
C4	48-60 inches	Light olive gray (5Y 6/2) loam, olive gray (5Y 4/2) moist; massive; slightly hard, firm, sticky, plastic; violently effervescent; very strongly alkaline, pH 9.6.

Range in Characteristics: These soils are usually calcareous throughout but some pedons may be noncalcareous in the upper one or two inches. Content of coarse fragments ranges from 0 to 5 percent and consists primarily of one-quarter to one-half inch angular sandstone fragments.

The hue of the A horizon is 5Y to 10YR. The value is 5 or 6 dry and 4 or 5 moist. The chroma is 2 or 3 dry and moist. The texture is typically a sandy loam but may range from sandy loam to very fine sandy loam. Reaction ranges from mildly alkaline to strongly alkaline.

The hue of the C horizon ranges from 5Y to 10YR. The value is 5 or 6 dry and 4 or 5 moist. The chroma ranges from 2 to 4 dry and is 2 or 3 moist. The texture is usually sandy loam to depths of 38 to 40 inches. Thick stratifications of very fine sandy loam are common below depths of 38 to 40 inches.

The Glenderson soils are mapped in complex with the Laney soils.

GLENDIVE SERIES

The Glendive series are well drained soils. They formed in sandy alluvium on floodplains. Slopes are 0 to 3 percent. Elevation is 7,000 to 7,200 feet.

Vegetation is big sagebrush, low rabbitbrush, and thickspike wheatgrass. Precipitation is 10 to 12 inches, and the mean annual air temperature is about 36°F. The growing season is about 80 to 90 days, but frost may occur in any month.

A representative profile is brown or grayish brown sandy loam stratified with thin lenses of loam and very fine sandy loam. The soil is mildly to strongly alkaline.

Permeability is moderately rapid. Available water capacity for the profile is 7.75 to 9.0 inches. Effective rooting depth is 60 inches or more. Typically, the soil has many fine, medium, and coarse roots to 16 inches and very few medium and coarse roots to 23 inches.

The Glendive soils are used for rangeland and wildlife habitat.

Representative profile is located in the SE¼, SE¼, Sec. 25, T. 31 N., R. 108 W.

A1 0-3 inches Brown (10YR 5/3) sandy loam, dark grayish brown (10YR 4/2) moist; weak fine crumb; soft, very friable, slightly sticky, slightly plastic; many fine medium and coarse roots; slightly effervescent; mildly alkaline, pH 7.8; clear smooth boundary.

C1 3-8 inches Brown (10YR 5/3) sandy loam, dark brown (10YR 4/3) moist; massive; soft, very friable, slightly sticky, slightly plastic; many fine medium and coarse roots; slightly effervescent; moderately alkaline, pH 8.4; clear smooth boundary.

C2 8-40 inches Grayish brown (10YR 5/2) sandy loam stratified with thin lenses of loam and very fine sandy loam, dark grayish brown (10YR 4/2) moist; massive; soft, very friable, nonsticky, nonplastic; many fine medium and coarse roots to 16 inches, very few medium and coarse roots to 23 inches; slightly effervescent in seams and spots; moderately alkaline, pH 8.4; gradual wavy boundary.

C3 40-60 inches Brown (10YR 5/3) sandy loam stratified with thin lenses of loam and very fine sandy loam, dark brown (10YR 4/3) moist; massive; slightly hard, very friable, slightly sticky, slightly plastic; slightly effervescent; strongly alkaline, pH 8.6.

Range in Characteristics: These soils are usually calcareous to the surface but may be noncalcareous in the upper two or three inches in some pedons. The content of gravel ranges from 0 to 5 percent.

The hue of the A1 horizon is 2.5Y or 10YR. The value is 4 or 5 dry and 4 or 5 moist. The chroma is 2 or 3 dry and moist. The texture ranges from sandy loam to very fine sandy loam. Reaction is mildly alkaline or moderately alkaline.

The hue of the C horizons range from 5Y to 10YR. The value ranges from 4 to 6 dry and is 4 or 5 moist. The chroma is 2 or 3 dry and moist. The texture is usually sandy loam stratified with thin lenses of loam, very fine sandy loam, and in some locations silt loam. The reaction is usually moderately alkaline but may be strongly alkaline in some horizons of some profiles.

Glendive-Havre complex, saline (250) - This complex consists of about 20 percent Glendive sandy loam, saline, 0 to 3 percent slopes; about 20 percent Havre loam, saline, 0 to 3 percent slopes; about 20 percent Glendive sandy loam, 0 to 3 percent slopes; and about 20 percent Havre loam, 0 to 3 percent slopes. The Glendive sandy loam and Haverson loam have the profiles described as representative for the respective series. The profile of the Glendive sandy loam, saline, is similar to the profile described as representative of the series except that it has a moderate to high accumulation of soluble salts, a fluctuating water table at 1.5 to 3 feet, and an available water capacity for the profile of 3.5 to 4.25 inches. The profile of the Havre loam, saline, is similar to the profile described as representative of the series except that it has a moderate to high accumulation of soluble salts, a fluctuating water table at 1.5 to 3 feet, and an available water capacity for the profile of 4.75 to 5.5 inches. The vegetation for the saline phases is inland saltgrass, greasewood, and alkali bluegrass. The soils occur in a highly intermingled pattern on nearly level floodplains along intermittent streams, primarily Sand Springs Draw and Alkali Creek. Included are about 10 percent wet soils, about 5 percent barren saline areas, and about 5 percent of ponded areas and stream channels.

Runoff for the soils in this complex is slow and the erosion hazard is slight.

This complex is used for rangeland and wildlife habitat. Glendive sandy loam, saline, and Havre loam, saline--Saline Subirrigated (10 to 14 inch precipitation zone) rangesite; Glendive sandy loam and Havre loam--Overflow (10 to 14 inch precipitation zone) rangesite.

HATERMUS SERIES

The Hatermus series are well drained soils. They formed in residuum from very strongly alkaline shale on ridges and upper hillsides. Slopes are 10 to 30 percent. Elevation is 6,800 to 7,000 feet. Vegetation is thickspike wheatgrass, Sandberg bluegrass, and Hood's phlox. Precipitation is 7 to 9 inches, and the mean annual air temperature is about 36°F. The growing season is about 80 to 90 days, but frost may occur in any month.

In a representative profile the surface layer is light gray, strongly alkaline loam about 1 inch thick. The underlying layer is light brownish gray strongly alkaline clay loam to light olive gray very strongly alkaline loam about 17 inches thick. Soft, very strongly alkaline, calcareous shale occurs at 18 inches.

The soil is moderately permeable. Available water capacity for the profile is 0.75 to 2.0 inches. Effective rooting depth is 10 to 20 inches. Typically, the soils have few fine and very fine roots to 6 inches and very few fine roots to 10 inches. An occasional root may occur below 10 inches.

The Hatermus soils are used for rangeland and wildlife habitat.

Representative profile is located near the center of Sec. 29, T. 31 N., R. 108 W.

A1	0-1 inch	Light gray (2.5Y 7/2) loam, grayish brown (2.5Y 5/2) moist; weak thin platy structure; soft, friable, slightly sticky, slightly plastic; few very fine and fine roots; effervescent; strongly alkaline, pH 8.6; clear smooth boundary.
C1	1-10 inches	Light brownish gray (2.5Y 6/2) clay loam, olive brown (2.5Y 4/3) moist; massive; slightly hard, friable, sticky, plastic; very few fine roots; violently effervescent; strongly alkaline, pH 9.0; gradual wavy boundary.
C2ca	10-18 inches	Light olive gray (5Y 6/2) loam, olive gray (5Y 4/2) moist; massive; slightly hard, friable, sticky, plastic; violently effervescent, many fine and medium threads, seams, and nests of secondary lime; very strongly alkaline, pH 9.4; clear smooth boundary.
C3	18 inches	Soft, light gray, very strongly alkaline, calcareous, platy shale.

Range in Characteristics: Depth to bedrock ranges from 10 to 20 inches. Content of coarse fragments ranges from 0 to 5 percent and consists of one-quarter to one-half inch shale fragments.

The hue of the profile ranges from 5Y to 10YR. The value is 5 to 7 dry and 4 to 6 moist. The chroma is 2 or 3 dry and moist. The texture ranges from very fine fandy loam to clay loam. Reaction is strongly alkaline to very strongly alkaline.

Hatermus soils are mapped in association or complex with the Fraddle soils, Haterton soils, and with Rock land.

HATERTON SERIES

The Haterton series are well drained soils. They formed in residuum from siltstone or shale on ridges and upper sidehills. Slopes are 10 to 30 percent. Elevation is 6,800 to 7,000 feet. Vegetation is thickspike wheatgrass, Hood's phlox, and Indian ricegrass. Precipitation is 7 to 9 inches, and the mean annual air temperature is about 36°F. The growing season is about 80 to 90 days, but frost may occur in any month.

In the representative profile the surface layer is light brownish gray, strongly alkaline fine sandy loam about 2 inches thick. The underlying layer is pale brown, strongly alkaline loam about 16 inches thick. Soft, platy shale occurs at 18 inches.

The soil is moderately permeable. Available water capacity for the profile is 1.5 to 3.75 inches. Effective rooting depth is 10 to 20 inches. Typically, the soil has few fine, medium, and coarse roots to 4 inches, few coarse roots to 10 inches, and very few coarse roots to 16 inches.

The Haterton soils are used for rangeland and wildlife habitat.

The representative profile is located in the NE$\frac{1}{4}$, SE$\frac{1}{4}$, Sec. 35, T. 31 N., R. 109 W.

A1	0-2 inches	Light brownish gray (10YR 6/2) fine sandy loam, dark grayish brown (10YR 4/2) moist; weak fine crumb structure; soft, very friable, nonsticky, nonplastic; few fine, medium, and coarse roots; 10 percent fine shale chips; violently effervescent; strongly alkaline, pH 8.6; clear smooth boundary.
C1	2-18 inches	Pale brown (10YR 6/3) loam, dark brown (10YR 4/3) moist; massive; soft, very friable, slightly sticky, slightly plastic; few coarse roots; 15 percent fine shale chips; violently effervescent; strongly alkaline, pH 8.6; gradual wavy boundary.
C2	18 inches	Soft, calcareous, olive, platy shale.

Range in Characteristics: Depth to bedrock ranges from 10 to 20 inches. Content of coarse fragments ranges from 5 to 15 percent and consists of one-quarter to one-half inch flat shale chips.

The hue of the soil ranges from 5Y to 10YR. The value is 5 or 6 dry and 4 or 5 moist. The chroma ranges from 2 to 4 dry and moist. The texture ranges from very fine sandy loam to clay loam,but in the surface one or two inches it ranges from sandy loam to loam. The reaction is usually strongly alkaline but may range from moderately alkaline to strongly alkaline.

The Haterton soils are mapped in association with Fraddle and Hatermus soils.

HAVRE SERIES

The Havre series are well drained soils. They formed in alluvium on nearly level floodplains. Slopes are 0 to 3 percent. Elevation is 7,000 to 7,300 feet. Vegetation is big sagebrush and thickspike wheatgrass. Precipitation is 10 to 12 inches, and the mean annual air temperature is about 36°F. The growing season is 80 to 90 days but frost may occur in any month.

In the representative profile the surface layer is brown, moderately alkaline loam about 4 inches thick. The underlying layer is grayish brown to brown, strongly alkaline, stratified loam to clay loam to 60 inches or more.

The soil is moderately permeable. Available water capacity for the profile is 9.5 to 11.0 inches. Effective rooting depth is 60 inches or more. Typically, the soil has many very fine, fine, medium, and coarse roots to 4 inches; few fine, medium, and coarse roots to 12 inches; and few coarse roots to 8 inches. There are very few coarse roots to 26 inches in some profiles.

The Havre soils are used for rangeland and wildlife habitat.

The representative profile is located in the SE$\frac{1}{4}$, SE$\frac{1}{4}$, Sec. 25, T. 31 N., R. 108 W.

A1	0-4 inches	Brown (10YR 5/3) loam, dark brown (10YR 4/3) moist; weak medium crumb structure; slightly hard, friable, slightly sticky, slightly plastic; many very fine, fine, medium, and coarse roots; slightly effervescent; moderately alkaline, pH 8.2; clear smooth boundary.
C1	4-12 inches	Grayish brown (10YR 5/2) loam, dark grayish brown (10YR 4/2) moist; massive; slightly hard, friable, sticky, plastic; few fine, medium, and coarse roots; effervescent; strongly alkaline, pH 8.5; clear smooth boundary.
C2	12-40 inches	Grayish brown (10YR 5/2) clay loam stratified with lenses of sandy loam and loam, dark grayish brown (10YR 4/2) moist; massive; slightly hard, firm, sticky, plastic; few coarse roots to 18 inches, very few coarse roots to 26 inches; thin lenses of visible salt accumulation; effervescent; strongly alkaline, pH 8.5; clear smooth boundary.
C3	40-60 inches	Brown (10YR 5/3) loam stratified with lenses of clay loam, sandy loam, and very fine sandy loam, dark brown (10YR 4/3) moist; massive; slightly hard, firm, slightly sticky, slightly plastic; thin bands of visible soluble salt accumulation; effervescent; strongly alkaline, pH 8.5.

Range in Characteristics: These soils are usually calcareous to the surface but may be noncalcareous in the upper one to three inches in some pedons. Content of coarse fragments ranges from 0 to 5 percent and consists of very fine gravel.

The hue of the A1 horizon is 2.5Y or 10YR. The value is 4 or 5 dry and 4 or 5 moist. The chroma is 3 or 4 dry and 2 or 3 moist. The texture is usually a loam but may range from very fine sandy loam to clay loam. Reaction is mildly alkaline to moderately alkaline.

The hue of the C horizon is 2.5Y to 10YR. The value is 4 or 5 dry and 4 or 5 moist. The chroma is 2 to 4 dry and 2 or 3 moist. The C horizon is stratified clay loam, loam, and sandy loams with a weighted clay percentage of 20 to 30 percent. Reaction is moderately alkaline to strongly alkaline, and thin lenses of soluble salt may occur in the lower part of the soil.

The Havre soils are mapped with the Glendive and Forelle soils.

HUGUSTON SERIES

The Huguston series are well drained soils. They formed in residuum from sandstone on ridges and upper hillsides. Slopes are 10 to 30 percent. Elevation is 6,800 to 7,000 feet. Vegetation is needleandthread, big sagebrush, and Letterman's needlegrass. Precipitation is 7 to 9 inches, and mean annual air temperature is about 36°F. The growing season is about 80 to 90 days, but frost may occur in any month.

In a representative profile the surface layer is grayish brown, moderately alkaline sandy loam about 2 inches thick. The underlying layer is light olive brown, strongly alkaline sandy loam about 12 inches thick. Soft sandstone occurs at 14 inches.

The soil has moderately rapid permeability. Available water capacity for the profile is 1.0 to 2.75 inches. Effective rooting depth is 10 to 20 inches. Typically, the soil has many fine and medium roots to 6 inches, few fine roots to 10 inches, and very few fine roots to 14 inches.

The Huguston soils are used for rangeland and wildlife habitat.

The representative profile is located near the center of Sec. 16, T. 30 N., R. 108 W.

A1	0-2 inches	Grayish brown (2.5Y 5/2) sandy loam, dark grayish brown (2.5Y 4/2) moist; weak fine crumb structure; soft, friable, slightly sticky, slightly plastic; many fine and medium roots; slightly effervescent; moderately alkaline, pH 8.4; clear smooth boundary.
C1	2-6 inches	Light olive brown (2.5Y 5/4) sandy loam, olive brown (2.5Y 4/4) moist; massive; soft, friable, slightly sticky, slightly plastic; many fine and medium roots; effervescent; strongly alkaline, pH 8.6; clear smooth boundary.
C2	6-14 inches	Light olive brown (2.5Y 5/4) sandy loam, olive brown (2.5Y 4/4) moist; massive; soft, friable, slightly sticky, slightly plastic; few fine roots; 25 percent fine sandstone fragments; effervescent; strongly alkaline, pH 8.6; gradual wavy boundary.
C3	14 inches	Soft, slightly calcareous sandstone.

Range in Characteristics: Depth to bedrock ranges from 10 to 20 inches. These soils are usually calcareous throughout but may be noncalcareous in the upper one or two inches in some pedons. Content of coarse fragments ranges from 15 to 25 percent, consisting of one-quarter to one-half inch angular sandstone fragments.

The hue of the A1 horizon is 5Y to 10YR. The value is 5 or 6 dry and 4 or 5 moist. The chroma is 2 or 3 dry and moist. The texture is typically a sandy loam but may range to very fine sandy loam. Reaction is moderately alkaline to strongly alkaline.

The hue of the C horizon ranges from 5Y to 10YR. The value ranges from 4 to 6 dry and is 4 or 5 moist. The chroma is 4 to 6 dry and 4 or 5 moist. The texture is typically a sandy loam but may range from coarse sandy loam to fine sandy loam with a clay content of about 10 to 16 percent. Reaction is moderately alkaline to strongly alkaline.

The Huguston soils are mapped with the Youjay soils and Rock land.

KOONICH SERIES

The Koonich series are well drained soils. They formed in alluvium on alluvial fans. Slopes are 0 to 3 percent. Elevation is 6,800 to 7,000 feet. Vegetation is needleandthread and big sagebrush. Precipitation is 7 to 9 inches, and the mean annual air temperature is about 36°F. The growing season is about 80 to 90 days, but frost may occur in any month.

In a representative profile the surface layer is grayish brown, neutral sandy loam about 3 inches thick. The underlying layer is grayish brown to brown, neutral sandy loam about 20 inches thick. The substratum is light brownish gray, neutral fine sand to pale brown, neutral sand to 60 inches or more.

The soil has moderately rapid permeability. Available water capacity for the profile is 4.25 to 5.75 inches. Effective rooting depth is 60 inches or more. Typically, the soil has many fine and very fine roots to 13 inches and few fine roots to 23 inches.

The Koonich soils are used for rangeland and wildlife habitat.

The representative profile is located in the NE¼, NW¼, Sec. 8, T. 30 N., R. 108 W.

A1	0-3 inches	Grayish brown (10YR 5/2) sandy loam, dark grayish brown (10YR 4/2) moist; weak fine crumb structure; soft, very friable, nonsticky, nonplastic; many very fine and fine roots; neutral, pH 6.8; clear smooth boundary.
C1	3-13 inches	Grayish brown (10YR 5/2) sandy loam, dark grayish brown (10YR 4/2) moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky, slightly plastic; many very fine and fine roots; neutral, pH 6.8; clear smooth boundary.
C2	13-23 inches	Brown (10YR 5/3) sandy loam, brown (10YR 4/3) moist; weak coarse subangular blocky structure; slightly hard, friable, slightly sticky, slightly plastic; few fine roots; neutral, pH 6.8; clear smooth boundary.
IIC3	23-40 inches	Light brownish gray (10YR 6/2) fine sand, grayish brown (10YR 5/2) moist; single grain; loose, nonsticky, nonplastic; neutral, pH 7.0; gradual wavy boundary.
IIC4	40-60 inches	Pale brown (10YR 6/3) sand, brown (10YR 4/3) moist; single grain; loose, nonsticky, nonplastic; neutral, pH 7.0.

Range in Characteristics: These soils are usually noncalcareous throughout, but some pedons may have thin bands or lenses of weakly calcareous materials usually below depths of 40 inches. Content of coarse fragments ranges from 5 to 10 percent and consists of one-quarter to one-half inch angular sandstone fragments.

The hue of the A1 horizon is 2.5Y or 10YR. The value is 5 or 6 dry and 4 or 5 moist. The chroma is 2 or 3 dry and moist. The texture is typically sandy

loam but may range from a coarse sandy loam to very fine sandy loam. Reaction is neutral to mildly alkaline.

The hue of the C1 and C2 horizons is 2.5Y or 10YR. The value is 5 or 6 dry and 4 or 5 moist. The chroma is 2 or 3 dry and moist. The texture is usually sandy loam with a clay content of 10 to 16 percent. Reaction is typically neutral but may range to mildly alkaline.

Koonich-Laney complex (356) - This complex consists of about 45 percent Koonich sandy loam, 0 to 3 percent slopes, and about 25 percent Laney loam, 0 to 3 percent slopes. The profile of the Koonich soils is the same as the profile described as representative of the series. The profile of the Laney soils is similar to the profile described under the series headings. This complex occupies nearly level alluvial fans dissected by numerous drainages, and the Koonich and Laney soils are highly intermingled in the landscape. This complex occurs below the Blue Rim topographic break and in some areas extends from the base of the Blue Rim into the lower-lying areas. Included are about 20 percent sandy loam soils stratified with lenses of fine sand, about 5 percent Glenderson soils, and about 5 percent soils similar to the Laney soils but lacking very strongly alkaline reactions.
Runoff is slow and erosion hazard is slight. Wind erosion hazard is severe for the Koonich soils.

This complex is used for rangeland and wildlife habitat. Koonich soils--Sandy (7 to 9 inch precipitation zone) rangesite. Laney soils--Saline Upland (7 to 9 inch precipitation zone) rangesite.

LANEY SERIES

The Laney series are well drained soils. They formed in alluvium from alkaline sandy shale on alluvial fans. Slopes are 0 to 3 percent. Elevation is 6,800 to 7,000 feet. Vegetation is thickspike wheatgrass, needleleaf sedge, Gardner saltbush, and Sandberg bluegrass. Precipitation is 7 to 9 inches, and the mean annual air temperature is about 36°F. The growing season is about 80 to 90 days, but frost may occur in any month.

In a representative profile the surface layer is light brownish gray, strongly alkaline loam about 3 inches thick. The underlying layer is light olive gray to olive gray, very strongly alkaline loam about 33 inches thick. The substratum is olive, strongly alkaline, stratified clay loam to olive, very strongly alkaline, stratified very fine sandy loam to 60 inches or more.

The soil has moderately slow permeability. Available water capacity is 5.0 to 5.75 inches. Effective rooting depth is 60 inches or more. Typically, the soil has many fine and medium roots to 3 inches, few fine and medium roots to 12 inches, and very few fine roots below 12 inches.

The Laney soils are used for rangeland and wildlife habitat.

The representative profile is located one-quarter mile SE of the west quarter corner of Sec. 23, T. 31 N., R. 108 W.

A1	0-3 inches	Light brownish gray (2.5Y 6/2) loam, dark grayish brown (2.5Y 4/2) moist; weak coarse crumb structure; soft, very friable, slightly sticky, slightly plastic; many fine and medium roots; slightly effervescent; strongly alkaline, pH 8.6; abrupt smooth boundary.
C1	3-12 inches	Light olive gray (5Y 6/2) loam, olive gray (5Y 4/2) moist; weak coarse subangular blocky structure; slightly hard, very friable, slightly sticky, slightly plastic; few fine and medium roots; effervescent; very strongly alkaline, pH 9.2; clear smooth boundary.
C2	12-36 inches	Olive gray (5Y 5/2) loam, olive gray (5Y 4/2) moist; weak coarse subangular blocky structure; hard, friable, sticky, plastic; very few roots; effervescent; very strongly alkaline, pH 9.4; clear smooth boundary.
C3ca	36-47 inches	Olive (5Y 5/3) clay loam stratified with thin lenses of fine sandy loam, loam, very fine sandy loam, olive (5Y 4/3) moist; massive; hard, firm, sticky, plastic; effervescent with a few fine threads of calcium carbonate; strongly alkaline, pH 9.0; gradual wavy boundary.
C4ca	47-60 inches	Olive (5Y 5/3) very fine sandy loam stratified with thin lenses of fine sandy loam and loam, olive (5Y 4/3) moist; massive; slightly hard, friable, slightly sticky, slightly plastic; effervescent with a few fine threads of calcium carbonate; very strongly alkaline, pH 9.2.

Range in Characteristics: The content of gravel ranges from 0 to 5 percent.

The hue of the A1 horizon ranges from 5Y to 10YR. The value is 5 or 6 dry and 4 or 5 moist. The chroma is 2 or 3 dry and moist. The texture is typically a loam but may range from sandy loam to clay loam.

The hue of the C horizons is 5Y to 10YR. The value ranges from 4 to 6 dry and 4 or 5 moist. The chroma is 2 or 3 dry and moist. The texture ranges from very fine sandy loam to clay loam, and the lower C horizons are stratified with thin lenses of sandy loam, loam, and very fine sandy loam. The reaction is typically very strongly alkaline to depths of 36 inches and may be very strongly alkaline to 60 inches in many profiles.

Laney-Glenderson complex (351) - This complex consists of about 50 percent Laney loam, 0 to 3 percent slopes, and about 20 percent Glenderson sandy loam, 0 to 3 percent slopes. The profiles of these soils are the same as the profiles described under the respective series headings. This complex occupies nearly level alluvial fans, and the soils occur in a highly intermingled pattern in the landscapes. In most areas the landscapes extend from the base of the Blue Rim northeastward on long, broad alluvial fans which are dissected by numerous drainages. Included are about 20 percent DeBone soils, about 5 percent barren alkaline areas, and about 5 percent soils similar to the Laney soils except that they are fine textured.

Runoff is slow to medium and erosion hazard is moderate to severe.

This complex is used for rangeland and wildlife habitat. Laney soils--Saline Upland (7 to 9 inch precipitation zone) rangesite. Glenderson soils--Loamy (7 to 9 inch precipitation zone) rangesite.

LITTSAN SERIES

The Littsan series are well drained soils. They formed in sandy wind-born deposits on undulating to rolling uplands. Slopes are 3 to 10 percent. Elevation is 6,800 to 7,000 feet. Vegetation is big sagebrush, needleandthread, Indian ricegrass, and thickspike wheatgrass. Precipitation is 7 to 9 inches, and the mean annual air temperature is about 36°F. The growing season is about 80 to 90 days, but frost may occur in any month.

In a representative profile the surface layer is light brownish gray, neutral fine sandy loam about 2 inches thick. The subsoil is pale brown, mildly alkaline sandy loam about 12 inches thick. The substratum is pale brown, mildly alkaline sandy loam about 10 inches thick. Calcareous, soft shale occurs at 24 inches.

The soil has moderately rapid permeability. Available water capacity for the profile is 2.25 to 5.25 inches. Effective rooting depth is 20 to 40 inches. Typically, the soil has many fine and very fine roots to 10 inches, few fine roots to 16 inches, and very few fine roots to 22 inches.

The Littsan soils are used for rangeland and wildlife habitat.

The representative profile is located in the $SW\frac{1}{4}$, $SW\frac{1}{4}$, Sec. 36, T. 31 N., R. 109 W.

A1	0-2 inches	Light brownish gray (10YR 6/2) fine sandy loam, dark grayish brown (10YR 4/2) moist; weak fine crumb structure; soft, very friable, nonsticky, nonplastic; many very fine and fine roots; neutral, pH 7.2; clear smooth boundary.
B21T	2-10 inches	Pale brown (10YR 6/3) sandy loam, dark brown (10YR 4/3) moist; weak medium angular blocky structure; slightly hard, very friable, slightly sticky, slightly plastic; many very fine and fine roots; patches of thin waxy coatings on some ped faces, bridges between sand grains; mildly alkaline, pH 7.4; clear smooth boundary.
B22t	10-14 inches	Pale brown (10YR 6/3) sandy loam, dark brown (10YR 4/3) moist; weak medium angular blocky structure; soft, very friable, slightly sticky, slightly plastic; few fine roots; waxy coatings on sand grains and clay bridges between sand grains; mildly alkaline, pH 7.4; clear smooth boundary.
C1	14-24 inches	Pale brown (10YR 6/3) sandy loam, brown (10YR 5/3) moist; weak medium angular blocky structure; soft, very friable, nonsticky, nonplastic; very few fine roots; mildly alkaline, pH 7.6; clear smooth boundary.

IIC2 24 inches Gray, calcareous, soft shale.

Range in Characteristics: Depth to bedrock ranges from 20 to 40 inches. These soils are usually noncalcareous throughout, but some pedons are weakly calcareous in the lower part of the C horizon. Thickness of solum ranges from 10 to 15 inches.

The hue of the A horizon is 2.5Y or 10YR. The value is 4 to 6 dry and 4 or 5 moist. The chroma is 2 or 3 dry and moist. The texture is fine sandy loam or very fine sandy loam. The reaction is neutral or mildly alkaline.

The hue of the B2t horizons is 2.5Y or 10YR. The value is 5 to 6 dry and 4 or 5 moist. The chroma is 3 or 4 dry and 2 or 3 moist. The texture is a sandy loam with a 10 to 16 percent clay content. Reaction is neutral or mildly alkaline.

The hue of the C horizon is 5Y to 10YR. The texture ranges from sandy loam to loamy fine sand. The reaction is mildly alkaline or moderately alkaline.

Littsan-Bodorumpe association (365) - This association consists of about 45 percent Littsan sandy loam, 3 to 10 percent slopes, and about 30 percent Bodorumpe fine sand, 3 to 15 percent slopes. The profiles of these soils are the same as the profiles described under the respective series headings. This association occupies gently sloping to moderately steep uplands. The Littsan soils occur on the lower sidehill slopes and uniform sloping areas. The Bodorumpe soils normally occur on the upper sidehill slopes, on the rounded ridges, and in some areas on northeast slopes. This association occurs below the Blue Rim topographic break, primarily along the Big Piney highway. Included are about 10 percent Bodorumpe-like soils with bedrock below 40 inches, about 5 percent Haterton soils, about 5 percent Huguston soils, and a total of about 5 percent Youjay and Ouard soils.

Runoff is medium to rapid, and erosion hazard is moderate to severe. Wind erosion hazard is severe.

This association is used for rangeland and wildlife. Littsan soils--Sandy (7 to 9 inch precipitation zone) rangesite. Bodorumpe soils--Sands (7 to 9 inch precipitation zone) rangesite.

MILREN SERIES

The Milren series are well drained soils. They formed in alluvium on alluvial fans. Slopes are 3 to 10 percent. Elevation is 7,000 to 7,300 feet. Vegetation is big sagebrush, Sandberg bluegrass, and thickspike wheatgrass. Precipitation is 10 to 12 inches, and the mean annual air temperature is about 36°F. The growing season is about 80 to 90 days, but frost may occur in any month.

In a representative profile the surface layer is brown, mildly alkaline sandy loam about 2 inches thick. The subsurface layer is light brownish gray, neutral sandy loam about 1 inch thick. The upper part of the subsoil is brown, mildly alkaline clay about 13 inches thick. The lower part of the subsoil is brown, moderately alkaline sandy clay loam about 8 inches thick. The substratum is light brownish gray, very strongly alkaline sandy clay loam to 60 inches or more.

The soil has moderately slow permeability. Available water capacity for the profile is 5.25 to 6.75 inches. Effective rooting depth is 60 inches or more. Typically, the soil has many fine, very fine, and medium roots to 3 inches and few fine and medium roots to 10 inches, and very few, very fine roots to 16 inches.

The Milren soils are used for rangeland and wildlife habitat.

The representative profile is located in the NE$\frac{1}{4}$, SE$\frac{1}{4}$, Sec. 21, T. 30 N., R. 108 W.

A1	0-2 inches	Brown (10YR 5/3) sandy loam, very dark brown (10YR 3/3) moist; weak fine crumb structure; soft, very friable, nonsticky, nonplastic; many very fine, fine, and medium roots; mildly alkaline, pH 7.4; clear smooth boundary.
A2	2-3 inches	Light brownish gray (10YR 6/2) sandy loam, dark grayish brown (10YR 4/2) moist; weak thin platy structure; soft, very friable, nonsticky, nonplastic; many very fine, fine, and medium roots; neutral, pH 7.2; abrupt smooth boundary.
B21t	3-10 inches	Brown (7.5YR 5/2) clay, dark brown (7.5YR 4/2) moist; moderate fine columnar parting to strong fine angular blocky structure; extremely hard, very firm, sticky, plastic; few fine and medium roots; thick continuous waxy coatings on all ped faces; mildly alkaline, pH 7.6; clear smooth boundary.
B22t	10-16 inches	Brown (7.5YR 5/2) clay, dark brown (7.5YR 4/2) moist; strong fine prismatic parting to strong fine angular blocky structure; extremely hard, firm, sticky, plastic; very few fine roots; thick continuous waxy coatings on all ped faces; mildly alkaline, pH 7.6; clear smooth boundary.
B3	16-24 inches	Brown (7.5YR 5/2) sandy clay loam, dark brown (7.5YR 4/2) moist; moderate fine and medium angular blocky structure; hard, friable, slightly sticky, slightly plastic; thin discontinuous waxy coatings on most ped faces; moderately alkaline, pH 8.4; clear smooth boundary.
Cca	24-60 inches	Light brownish gray (10YR 6/2) sandy clay loam, dark grayish brown (10YR 4/2) moist; massive; hard, firm, sticky, plastic; violently effervescent, many fine and medium seams of secondary lime; very strongly alkaline, pH 9.2.

Range in Characteristics: Depth to continuous secondary calcium carbonate accumulation is 18 to 30 inches. Thickness of solum ranges from 18 to 30 inches.

The hue of the A1 horizon is 2.5Y or 10YR. The value is 4 or 5 dry and 3 or 4 moist. The chroma is 2 or 3 dry and moist. The texture is typically a sandy loam but may range to very fine sandy loam. Reaction is neutral or mildly alkaline.

The hue of the B2t horizon is 10YR or 7.5YR. The value is 5 or 6 dry and 4 or 5 moist. The chroma is 2 or 3 dry and moist. The texture is clay or sandy clay with a clay content ranging from 36 to about 44 percent. Reaction is neutral or mildly alkaline.

The hue of the B3 horizon is 10YR or 7.5YR. The value is 5 or 6 dry and 4 or 5 moist. The chroma is 2 or 3 dry and moist. Reaction is moderately alkaline or strongly alkaline.

The hue of the Cca horizon is 2.5Y or 10YR. The value is 5 or 6 dry and 4 or 5 moist. The chroma is 2 or 3 dry and moist.

The Milren soils are mapped with the Bluerim and Abston soils.

NATRARGIDS

Natrargids are well drained soils. They formed in residuum from alkaline shale on hillsides and alluvial fans. Slopes are 3 to 15 percent. Elevation is 6,800 to 7,300 feet. Vegetation is low sagebrush, thickspike wheatgrass, and big sagebrush. Precipitation is 7 to 12 inches, and the mean annual air temperature is about 36°F. The growing season is about 80 to 90 days, but frost may occur in any month.

These are very strongly alkaline soils which vary considerably in depth and degree of development.

Natrargids (110) - This mapping unit consists of fine textured, very strongly alkaline soils of varying depth. The soils occur in a very complex pattern on sidehill slopes and alluvial fans. Included are very strongly alkaline, barren areas. Runoff is medium to rapid, and erosion hazard is moderate to severe. The soils of this unit are used for rangeland and wildlife habitat, and are in the Dense Clay (10 to 14 inch precipitation zone) rangesite.

ONASON SERIES

The Onason series are somewhat excessively drained soils. They formed in residuum from sandstone on ridges and upper hillsides. Slopes are 10 to 30 percent. Elevation is 7,000 to 7,300 feet. Vegetation is big sagebrush, Letterman's needlegrass, and nailwort. Precipitation is 10 to 12 inches, and the mean annual air temperature is about 36°F. The growing season is about 80 to 90 days, but frost may occur in any month.

In a representative profile the surface layer is grayish brown, neutral sandy loam about 3 inches thick. The underlying layer is grayish brown, neutral gravelly sandy loam about 8 inches thick. Soft, arkosic sandstone occurs at 11 inches.

The soil has moderately rapid permeability. Available water capacity for the profile is 0.75 to 2.0 inches. Effective rooting depth is 10 to 20 inches. Typically, the soil has many fine and very fine roots to 3 inches and few fine roots to 11 inches.

The Onason soils are used for rangeland and wildlife habitat.

The representative profile is located in the SE¼, NE¼, Sec. 25, T. 30 N., R. 108 W.

A1	0-3 inches	Grayish brown (10YR 5/2) sandy loam, dark grayish brown (10YR 4/2) moist; weak fine crumb structure; soft, very friable, slightly sticky, slightly plastic; many very fine and fine roots; neutral, pH 7.0; clear smooth boundary.
C1	3-11 inches	Grayish brown (10YR 5/2) gravelly sandy loam, dark grayish brown (10YR 4/2) moist; massive; slightly hard, loose, non-sticky, nonplastic; few fine roots; 20 percent very fine gravel; neutral, pH 7.2; gradual wavy boundary.
C2	11 inches	Soft, noncalcareous, coarse grained, arkosic sandstone.

Range in Characteristics: Depth to bedrock ranges from 10 to 20 inches. Content of coarse fragments ranges from 15 to 25 percent and consists of very fine gravel.

The hue of A and C horizons is 2.5Y or 10YR. The value is 4 to 6 dry and 4 or 5 moist. The chroma is 2 or 3 dry and moist. Reaction is neutral or mildly alkaline.

The Onason soils are mapped with the Rallod soils and with Rock outcrop.

OUARD SERIES

The Ouard series are well drained soils. They formed in residuum from shale on undulating to rolling ridges. Slopes are 3 to 10 percent. Elevation is 6,800 to 7,000 feet. Vegetation is big sagebrush, thickspike wheatgrass, Sandberg bluegrass, and needleandthread. Precipitation is 7 to 9 inches, and the mean annual air temperature is about 36°F. The growing season is about 80 to 90 days, but frost may occur in any month.

In a representative profile the surface layer is brown, neutral sandy loam about 2 inches thick. The upper part of the subsoil is yellowish brown to brown, mildly alkaline sandy clay loam about 9 inches thick. The lower part of the subsoil is light brownish gray, strongly alkaline sandy clay loam about 5 inches thick. Soft, olive colored shale occurs at 16 inches.

The soil is moderately permeable. Available water capacity for the profile is 1.25 to 3.25 inches. Effective rooting depth is 10 to 20 inches. Typically, the soil has many fine and very fine roots to 7 inches, few fine and very fine roots to 11 inches, and very few roots below 11 inches.

The Ouard soils are used for rangeland and wildlife habitat.

The representative profile is located in the SW¼, SW¼, Sec. 29, T. 31 N., R. 108 W.

A1	0-2 inches	Brown (10YR 5/3) sandy loam, very dark brown (10YR 3/3) moist; weak fine crumb structure; soft, very friable, non-sticky, nonplastic; many very fine and fine roots; neutral, pH 7.2; clear smooth boundary.
B21t	2-7 inches	Yellowish brown (10YR 5/4) sandy clay loam, dark brown (10YR 4/3) moist; moderate medium prismatic parting to moderate fine angular blocky structure; slightly hard, friable, slightly sticky, slightly plastic; many fine and very fine roots; thin nearly continuous waxy coatings on all ped faces; mildly alkaline, pH 7.4; clear smooth boundary.
B22t	7-11 inches	Brown (10YR 5/3) sandy clay loam, dark brown (10YR 4/3) moist; moderate medium angular blocky structure; slightly hard, friable, slightly sticky, slightly plastic; few very fine and fine roots; thin nearly continuous waxy coatings on all ped faces; mildly alkaline, pH 7.6; clear smooth boundary.
B3ca	11-16 inches	Light brownish gray (10YR 6/2) sandy clay loam, grayish brown (10YR 5/2) moist; weak coarse angular blocky structure; slightly hard, friable, slightly sticky, slightly plastic; very few roots; thin discontinuous waxy coatings on some ped faces; effervescent, many coarse threads, seams, and soft masses of secondary lime; strongly alkaline, pH 8.8; gradual wavy boundary.
C	16 inches	Soft, calcareous, olive shale.

Range in Characteristics: Depth to bedrock ranges from 10 to 20 inches. Depth to calcareous materials ranges from 7 to 14 inches. Thickness of solum ranges from 10 to 20 inches. The content of gravel is 0 to 5 percent.

The hue of the A1 horizon is 2.5Y or 10YR. The value is 5 or 6 dry and 4 or 5 moist. The chroma is 2 or 3 dry and moist. The texture is typically a sandy loam but may range from a coarse sandy loam to very fine sandy loam. Reaction is neutral or mildly alkaline.

The hue of the B2t horizon is 2.5Y or 10YR. The value is 5 or 6 dry and 4 or 5 moist. The chroma is 3 to 5 dry and 3 or 4 moist. The texture is typically a sandy clay loam with a clay content ranging from 20 to about 28 percent. More than 35 percent of the sand is fine sand or coarser. Reaction is neutral or mildly alkaline.

The hue of the B3ca horizon is 5Y to 10YR. The value is 5 to 7 dry and 5 or 6 moist. The chroma is 2 or 3 dry and moist. The texture is typically a sandy clay loam but may range from a fine sandy loam to sandy clay loam. Reaction is moderately alkaline or strongly alkaline.

The Ouard soils are mapped with the Fraddle and Youjay soils.

RALLOD SERIES

The Rallod series are well drained soils. They formed in residuum from alkaline shale on ridges and upper hillsides. Slopes are 10 to 30 percent. Elevation is 7,000 to 7,300 feet. Vegetation is thickspike wheatgrass, Canby bluegrass, Hoods phlox, and low sage. Precipitation is 10 to 12 inches. and the mean annual air temperature is about 36°F. The growing season is about 80 to 90 days, but frost may occur in any month.

In a representative profile the surface layer is brown, mildly alkaline sandy loam about 3 inches thick. The upper part of the subsoil is brown, strongly alkaline sandy clay about 6 inches thick. The lower part of the subsoil is brown, very strongly alkaline sandy clay about 3 inches thick. Soft, variegated alkaline shale occurs at 12 inches.

The soil is slowly permeable. Available water capacity for the profile is 0.70 to 3.25 inches. Effective rooting depth is 10 to 20 inches. Typically, the soil has many fine medium and very fine roots to 3 inches, few fine and very fine roots to 9 inches.

The Rallod soils are used for rangeland and wildlife habitat.

The representative profile is located in SE¼, NE¼, Sec. 29, T. 30 N., R. 109 W.

A1	0-3 inches	Brown (10YR 5/3) sandy loam, dark grayish brown (10YR 4/2) moist; weak fine crumb structure; loose, very friable, slightly sticky, slightly plastic; many very fine, fine, and medium roots; mildly alkaline, pH 7.6; clear smooth boundary.
B2t	3-9 inches	Brown (7.5YR 5/2) sandy clay, dark brown (7.5YR 4/2) moist; strong fine columnar parting to strong fine angular blocky structure; extremely hard, very firm, very sticky, plastic; few very fine and fine roots; thick continuous waxy coatings on all ped faces; strongly alkaline, pH 9.0; clear smooth boundary.
B3ca	9-12 inches	Brown (7.5YR 5/2) sandy clay, dark grayish brown (10YR 4/2) moist; strong fine angular blocky structure; extremely hard, very firm, very sticky, plastic; thick discontinuous waxy coatings on some ped faces; effervescent; very strongly alkaline, pH 9.2; gradual wavy boundary.
C1	12 inches	Soft, variegated colored, alkaline shale.

Range in Characteristics: Depth to bedrock ranges from 10 to 20 inches. These soils are usually noncalcareous in the A1 and B2t horizons or depths of from 6 to 10 inches. Thickness of solum ranges from 10 to 15 inches.

The hue of the A1 horizon is 2.5Y or 10YR. The value is 4 or 5 dry and 3 or 4 moist. The chroma is 2 or 3 dry and moist. The texture ranges from coarse sandy loam to very fine sandy loam.

The hue of the B2t horizon is 10YR or 7.5YR. The value is 4 or 5 dry and 4 or 5 moist. The chroma is 2 or 3 dry and moist. The texture is sandy clay or clay with 38 to 44 percent clay. Reaction ranges from strongly alkaline to very strongly alkaline. Exchangeable sodium is more than 15 percent.

The hue of the B3ca horizon is 10YR or 7.5YR. The value is 4 to 6 dry and 4 or 5 moist. The chroma is 2 or 3 dry and moist. The texture is sandy clay or clay with a clay content of 35 to 45 percent. Reaction is very strongly alkaline. Exchangeable sodium is more than 15 percent.

Rallod-Onason-Rock outcrop complex, 10 to 30 percent slopes (253) - This complex consists of about 35 percent Rallod sandy loam, 10 to 30 percent slopes, about 25 percent Onason sandy loam, 10 to 30 percent slopes, and about 20 percent Rock outcrop. The profiles of these soils are the same as the profiles described under the respective series headings. This complex occurs on moderately steep to steep ridges and upper hillsides. In some areas the complex forms the sideslopes of steep drainages. In other areas the landscapes lead from high, rolling uplands to lower soil associations, forming a landscape break. The soils and Rock outcrop are intermingled in the landscapes. This complex occurs above the Blue Rim topographic break. Included are about 10 percent Tigon soils, about 5 percent Bluerim soils, and about 5 percent Coalmont soils.

Runoff is rapid and erosion hazard is severe. Wind erosion hazard is severe.

This complex is used for rangeland and wildlife habitat. Rallod soils--Shallow Clayey (10 to 14 inch precipitation zone) rangesite. Onason soils--Shallow Sandy (10 to 14 inch precipitation zone) rangesite. Rock outcrop--rangesite not assigned.

RELSOB SERIES

The Relsob series are well drained soils. They formed in alluvium on alluvial fans. Slopes are 3 to 10 percent. Elevation is 7,000 to 7,300 feet. Vegetation is needleandthread, big sagebrush, thickspike wheatgrass, and Indian ricegrass. Precipitation is 10 to 12 inches, and the mean annual air temperature is about 36°F. The growing season is about 80 to 90 days, but frost may occur in any month.

In a representative profile the surface layer is pale brown, neutral sandy loam about 2 inches thick. The upper part of the subsoil is pinkish gray, neutral sandy clay loam about 5 inches thick. The lower part of the subsoil is brown, neutral sandy clay loam about 9 inches thick. The upper part of the substratum is yellowish brown, neutral sandy loam about 8 inches thick. The lower part of the substratum is grayish brown, neutral gravelly sand to 60 inches or more.

The soil is moderately permeable. Available water capacity for the profile is 4.5 to 6.0 inches. Effective rooting depth is 60 inches or more. Typically, the soil has many fine and very fine and few coarse roots to 7 inches, few very fine and coarse roots to 16 inches, and few fine roots to 24 inches.

The Relsob soils are used for rangeland and wildlife habitat.

The representative profile is located in NW¼, SW¼, Sec. 26, T. 31 N., R. 108 W.

A1	0-2 inches	Pale brown (10YR 6/3) sandy loam, dark brown (10YR 4/3) moist; weak fine crumb structure; soft, very friable, non-sticky, nonplastic; many very fine and fine and few coarse roots; neutral, pH 6.8; clear smooth boundary.
B21t	2-7 inches	Pinkish gray (7.5YR 6/2) sandy clay loam, dark brown (7.5YR 4/2) moist; weak medium prismatic parting to moderate medium subangular blocky structure; slightly hard, friable, slightly sticky, slightly plastic; many very fine and fine and few coarse roots; thin patchy waxy coatings on ped faces, slight bridges between sand grains; neutral, pH 7.0; clear smooth boundary.
B22t	7-16 inches	Brown (7.5YR 5/4) sandy clay loam, dark brown (7.5YR 4/2) moist; weak medium prismatic parting to moderate medium subangular blocky structure; slightly hard, friable, slightly sticky, slightly plastic; few very fine, fine, and coarse roots; thin patches of waxy coatings on some ped faces, clay bridging between sand grains; neutral, pH 7.2; gradual wavy boundary.
C1	16-24 inches	Yellowish brown (10YR 5/4) sandy loam, dark yellowish brown (10YR 4/4) moist; very weak coarse subangular blocky structure parting to single grained; soft, very friable, non-sticky, nonplastic; very few fine roots; neutral, pH 7.2; gradual wavy boundary.
C2	24-60 inches	Grayish brown (10YR 5/2) gravelly sand, dark grayish brown (10YR 4/2) moist; single grained; loose, nonsticky, non-plastic; neutral, pH 7.2.

Range in Characteristics: These soils are usually noncalcareous throughout, but thin lenses of calcareous materials may occur in the lower C horizons in some pedons.

The hue of the A1 horizon is 10YR or 7.5YR. The value is 5 or 6 dry and 4 or 5 moist. The chroma is 2 or 3 dry and moist. The texture is typically a sandy loam but ranges from a coarse sandy loam to fine sandy loam.

The hue of the B2t horizon is 10YR or 7.5YR. The value is 5 or 6 dry and 4 or 5 moist. The chroma is 3 or 4 dry and 2 or 3 moist. The texture is typically a sandy clay loam with 20 to 26 percent clay. More than 35 percent of the sand fraction is fine sand or coarser. The content of very fine gravel is 5 to 10 percent. Reaction is neutral or mildly alkaline.

The hue of the C1 horizon is 2.5Y to 7.5YR. The texture is coarse sandy loam or fine sandy loam. The content of very fine gravel is 5 to 10 percent. Reaction is neutral or mildly alkaline.

The hue of the C2 horizon is 2.5Y to 7.5YR. The content of very fine gravel ranges from 35 to 50 percent. Reaction is neutral to mildly alkaline.

The Relsob soils are mapped with the Ryark soils.

Rock land-Hatermus complex, 10 to 30 percent slopes (359) - This complex consists of about 30 percent Rock land; about 25 percent Hatermus loam, 10 to 30 percent slopes; and about 20 percent Youjay sandy loam, 10 to 30 percent slopes. The Rock land consists of about 60 percent barren, red and variegated, very strongly alkaline shale and about 40 percent very shallow soils. The profiles of the Hatermus and Youjay soils are similar to the profiles described under their respective series headings. This complex occupies ridges and sidehill slopes. These landscapes usually extend from the base of the Blue Rim out into the lower-lying areas. They generally run in a north and south direction and are long and narrow. The Rock land and soils are intermingled in the landscapes. In some areas the west slopes of the landscapes are dissected leaving sizeable areas of nearly barren shale. Included are about 10 percent Huguston soils; about 10 percent moderately deep sandy soils on lee hillsides; and about 5 percent nearly barren, alkali soils in the form of slick spots.

Runoff is rapid and erosion hazard is severe. Wind erosion hazard on Youjay soils is severe.

This complex is used for rangeland and wildlife habitat. Rock land--Shale (7 to 9 inch precipitation zone) rangesite. Hatermus soils--Shallow Loamy (7 to 9 inch precipitation zone) rangesite. Youjay soils--Shallow Clayey (7 to 9 inch precipitation zone) rangesite.

Rock land, Huguston, and Youjay soils, 10 to 30 percent slopes (357) - This undifferentiated unit consists of about 30 percent Rock land; about 25 percent Huguston sandy loam, 10 to 30 percent slopes; and about 20 percent Youjay sandy loam, 10 to 30 percent slopes. There is considerable variation in composition of the individual areas, and all of the soils may not occur in each area. The Rock land consists of about 60 percent barren, red and variegated, very strongly alkaline shale and about 40 percent very shallow soils. The profiles of the Huguston and Youjay soils are similar to the profiles described under their respective series headings. This mapping unit occupies very strongly sloping ridges and sidehill slopes incised by many gullies and drainages and occurs primarily on the face of the Blue Rim topographic break. The Rock land and soils are highly intermingled in the landscapes. The inclusions in the mapping unit are many and varied. They consist of a total of about 25 percent thin fine textured soils, moderately deep sandy soils, gullied land, Laney soils, DeBone soils, and Fraddle soils.

Runoff is rapid and erosion hazard is severe. Wind erosion hazard on Huguston and Youjay soils is severe.

This unit is used for rangeland and wildlife habitat. Rock land--Shale (7 to 9 inch precipitation zone) rangesite. Huguston soils--Shallow Sandy (7 to 9 inch precipitation zone) rangesite. Youjay soils--Shallow Clayey (7 to 9 inch precipitation zone) rangesite.

Rock land-Natrargids complex (112) - This complex consists of about 50 percent Rock land and about 30 percent Natrargids. The Rock land consists of about 60 percent barren red shale and about 40 percent very shallow soils. The Natrargids are shallow to moderately deep, very strongly alkaline, fine textured red soils. The landscapes occur below the Blue Rim and consist of ridges and sidehill slopes

of 6 to 20 percent gradient. The Rock land and the Natrargids occur in an intermingled pattern. Included are about 20 percent "slick spots" consisting of nearly barren alkali soils.

Runoff is rapid and erosion hazard is severe.

This complex is used for rangeland and wildlife habitat. Rock land--Shale (7 to 9 inch precipitation zone) rangesite. Natrargids--Dense Clay (7 to 9 inch precipitation zone) rangesite.

RYARK SERIES

The Ryark series are well drained soils. They formed in sandy alluvium on undulating to rolling alluvial fans. Slopes are 3 to 10 percent. Elevation is 7,000 to 7,300 feet. Vegetation is big sagebrush, needleandthread, and thickspike wheatgrass. Precipitation is 10 to 12 inches, and the mean annual air temperature is about 36°F. The growing season is about 80 to 90 days, but frost may occur in any month.

In a representative profile the surface layer is brown, neutral loamy sand about 2 inches thick. The subsoil is brown, neutral sandy loam about 16 inches thick. The upper part of the substratum is grayish brown, neutral loamy sand about 12 inches thick. The lower part of the substratum is light brownish gray, neutral gravelly sand to 60 inches or more.

The soil has moderately rapid permeability. Available water capacity for the profile is 3.75 to 5.25 inches. Effective rooting depth is 60 inches or more. Typically, the soil has many fine and very fine roots to 10 inches, few fine and very fine roots to 18 inches, and very few fine roots to 30 inches.

The Ryark soils are used for rangeland and wildlife habitat.

The representative profile is located in SW¼, NE¼, Sec. 26, T. 31 N., R. 108 W.

A1	0-2 inches	Brown (10YR 5/3) loamy sand, dark brown (10YR 4/3) moist; weak fine subangular structure; loose, nonsticky, nonplastic; many very fine and fine roots; neutral, pH 7.0; clear smooth boundary.
B21t	2-10 inches	Brown (10YR 5/3) sandy loam, dark brown (10YR 4/3) moist; weak medium subangular blocky structure; soft, very friable, slightly sticky, slightly plastic; many very fine and fine roots; thin patchy waxy coatings on ped faces, clay bridges between sand grains; 4 percent very fine gravel; neutral, pH 7.2; clear smooth boundary.
B22t	10-18 inches	Brown (7.5YR 5/4) sandy loam, dark brown (7.5YR 4/4) moist; weak medium subangular blocky structure; soft, very friable, slightly sticky, slightly plastic; few very fine and fine roots; thin waxy coatings on ped faces, clay bridges between sand grains; 4 percent very fine gravel; neutral, pH 7.2; clear smooth boundary.

C1	18-30 inches	Grayish brown (10YR 5/2) loamy sand, dark grayish brown (10YR 4/2) moist; weak coarse subangular blocky structure; soft, loose, nonsticky, nonplastic; very few fine roots; 15 percent very fine gravel; neutral, pH 7.2; clear smooth boundary.
C2	30-60 inches	Light brownish gray (10YR 6/2) gravelly sand, dark grayish brown (10YR 4/2) moist; single grained; loose, nonsticky, nonplastic; neutral, pH 7.0.

Range in Characteristics: Thickness of solum ranges from 14 to 20 inches.

The hue of the A1 horizon is 2.5Y or 10YR. The value is 4 or 5 dry and 3 or 4 moist. The chroma is 2 or 3 dry and moist. The texture ranges from fine sand to loamy sand. Reaction is neutral or mildly alkaline.

The hue of the B2t horizon is 2.5Y to 7.5YR. The value is 5 or 6 dry and 4 or 5 moist. The chroma is 3 or 4 dry and 2 or 3 moist. The texture is sandy loam or fine sandy loam. The clay content is about 10 to 16 percent. Content of very fine gravel is 0 to 10 percent. Reaction is neutral or mildly alkaline.

The hue of the C horizon ranges from 2.5Y to 7.5YR. The texture ranges from loamy sand to gravelly sand. Content of very fine gravel in the upper part of the C horizon is 10 to 15 percent, and in the lower part of the C it is 25 to 35 percent. Reaction is neutral or mildly alkaline.

Ryark-Cothran association (260) - This association consists of about 55 percent Ryark loamy sand, 3 to 6 percent slopes, and about 25 percent Cothran fine sand, 3 to 6 percent slopes. The profiles of these soils are similar to the profiles described under the respective series headings. This association occupies undulating alluvial fans and uplands. The Ryark series occurs on smoothly sloping areas and concave surfaces. The Cothran soils occur in the rounded portions of the landscapes. Included are about 10 percent Relsob soils and about 10 percent soils similar to the Ryark soils but with bedrock at depths of 36 to 40 inches.

Runoff is slow to moderate and erosion hazard is moderate to severe. Wind erosion hazard is severe.

This association is used for rangeland and wildlife habitat. Ryark soils--Sandy (10 to 14 inch precipitation zone) rangesite. Cothran soils--Sands (10 to 14 inch precipitation zone) rangesite.

Ryark-Relsob complex, 3 to 10 percent slopes (259) - This complex consists of about 45 percent Ryark loamy sand, 3 to 10 percent slopes, and about 35 percent Relsob sandy loam, 3 to 10 percent slopes. The profiles of these soils are the same as the profiles described under the respective series headings. This complex occupies gently sloping to sloping alluvial fans that occur at the base of rolling uplands and the soils are intermingled in the landscapes. Included are about 10 percent soils similar to the Cothran soils but with bedrock at depths of 40 to 60 inches, about 5 percent Tigon soils, and about 5 percent Bluerim soils. This complex occurs primarily in the Alkali Creek-Sand Springs Draw area.

Runoff is slow to medium and erosion hazard is moderate to severe. Wind erosion hazard is severe.

This complex is used for rangeland and wildlife habitat. Ryark soils--Sandy (10 to 14 inch precipitation zone) rangesite. Relsob soils--Loamy (10 to 14 inch precipitation zone) rangesite.

SALORTHIDS

These soils have high to very high accumulations of soluble salts. They formed in residuum or alluvium from saline materials on alluvial fans and footslopes. In many places the soils have been affected by fluctuating water tables. Slopes are 3 to 10 percent. Elevation is 6,800 to 7,000 feet. Vegetation is greasewood, Gardners saltbush, alkali grass, and scattered clumps of thickspike wheatgrass. Precipitation is 7 to 9 inches, and the mean annual air temperature is about 36°F. The growing season is about 80 to 90 days, and frost may occur in any month.

Salorthids-Natrargids complex (113) - This complex consists of soils with high to very high accumulations of soluble salts and very strongly alkaline soils and occurs on gently sloping alluvial fans and sloping footslopes. In most areas the landscapes occur adjacent to drainageways. The saline and alkaline soils form in a very complex, intermingled pattern in the landscapes displaying varying degrees of salinity and alkalinity. The principal areas of this unit are in the Alkali Creek area. Included in the complex are Youjay soils and DeBone soils. Sizeable areas in each landscape are barren.

Runoff is medium to rapid and erosion hazard is severe.

This complex is used for rangeland and wildlife habitat and is in Saline Lowland (7 to 9 inch precipitation zone) rangesite.

Shale Rock land (102) - This land type consists of about 85 percent barren shale and about 15 percent very shallow soils. It occurs primarily along the face of the Blue Rim and on ridges above the Blue Rim. A few areas occur at the base of the Blue Rim. Included are some sandy shales and thin strata of sandstone.

Runoff is rapid and erosion hazard is severe. These areas are high sediment producers.

This land type is used primarily for wildlife habitat. Rangesite not assigned.

TIGON SERIES

The Tigon series are well drained soils. They formed in residuum from cemented, arkosic sand and very fine gravel on ridges and upper sidehills. Slopes are 6 to 30 percent. Elevation is 7,000 to 7,300 feet. Vegetation is Indian ricegrass, Canby bluegrass, thickspike wheatgrass, and big sagebrush. Precipitation is 10 to 12 inches, and the mean annual air temperature is about 36°F. The growing season is about 80 to 90 days, but frost may occur in any month.

In a representative profile the surface layer is brown, neutral sandy loam about 2 inches thick. The subsoil is brown, neutral sandy clay loam about 13 inches thick. Cemented, noncalcareous, arkosic sand and very fine gravel occur at 15 inches.

The soil is moderately permeable. Available water capacity for the profile is 1.25 to 3.25 inches. Effective rooting depth is 10 to 20 inches. Typically, the soil has many very fine, fine, and medium roots to 2 inches; many very fine, fine, and medium roots to 8 inches; and a few fine and coarse roots to 15 inches.

The Tigon soils are used for rangeland and wildlife habitat.

The representative profile is located in the NE¼, SW¼, Sec. 33, T. 30 N., R. 108 W.

A1	0-2 inches	Brown (10YR 5/3) sandy loam, very dark brown (10YR 3/3) moist; weak medium crumb structure; soft, very friable, slightly sticky, slightly plastic; many very fine, fine, and medium roots; 15 percent very fine gravel; neutral, pH 6.8; clear smooth boundary.
B21t	2-8 inches	Brown (10YR 5/3) sandy clay loam, dark brown (10YR 4/3) moist; weak medium prismatic parting to moderate medium angular blocky structure; slightly hard, friable, sticky, plastic; many very fine, fine, and medium roots; thin nearly continuous waxy coatings on ped faces; 10 percent very fine gravel; neutral, pH 6.6; clear smooth boundary.
B22t	8-15 inches	Brown (10YR 5/3) sandy clay loam, dark brown (10YR 4/3) moist; weak medium angular blocky structure; slightly hard, friable, slightly sticky, slightly plastic; few fine and coarse roots; thin discontinuous waxy coatings on ped faces; 20 percent very fine gravel; neutral, pH 6.6; gradual wavy boundary.
C	15 inches	Cemented, noncalcareous, arkosic sand and very fine gravel that breaks up fairly easy with a spade.

Range in Characteristics: Depth to cemented very fine gravel and sand ranges from 10 to 20 inches. Thickness of solum ranges from 10 to 20 inches.

The hue of the A1 horizon is 2.5Y or 10YR, value is 5 or 6 dry and 3 or 4 moist; and chroma is 2 or 3 dry and moist. The texture is sandy loam or fine sandy loam. The reaction is slightly acid or neutral.

The hue of the B2t horizon is 10YR or 7.5YR. The value is 5 or 6 dry and 4 or 5 moist. The chroma is 3 or 4 dry and 2 or 3 moist. The texture is sandy clay loam with a clay content of 20 to 26 percent and more than 35 percent fine sand or coarser. Content of very fine gravel is 10 to 20 percent. Reaction is neutral or mildly alkaline.

Tigon-Bluerim association (252) - This association consists of about 50 percent Tigon sandy loam, 6 to 30 percent slopes, and about 25 percent Bluerim sandy loam, 3 to 15 percent slopes. The profile of the Tigon soils is the same as the profile described as representative of the series. The profile of the Bluerim soils is similar to the profile described under the series heading. This association occupies landscapes composed of rolling to hilly ridges and sidehills. The Tigon soils occupy the ridges and upper sidehills, and the Bluerim soils occur on the lower hillsides. This association occurs above the Blue Rim topographic break. Included are about 15 percent Rallod soils, about 5 percent Onason soils, and about 5 percent soils similar to the Bluerim soils but with bedrock at depths below 40 inches. In some areas there are outcrops of alkaline shale and inclusions of reddish colored soils similar to the Bluerim soils.

Runoff is medium to rapid and erosion hazard is moderate to severe. Wind erosion hazard is severe.

This association is used for rangeland and wildlife habitat. Tigon soils--Shallow Loamy (10 to 14 inch precipitation zone) rangesite. Bluerim soils--Loamy (10 to 14 inch precipitation zone) rangesite.

TRESANO SERIES

The Tresano series are well drained soils. They formed in mixed alluvium on alluvial fans. Slopes are 6 to 10 percent. Elevation is 6,800 to 7,000 feet. Vegetation is big sagebrush, thickspike wheatgrass, Indian ricegrass, and needleandthread. Precipitation is 7 to 9 inches, and the mean annual air temperature is about 36°F. The growing season is about 80 to 90 days, but frost may occur in any month.

In a representative profile the surface layer is grayish brown, mildly alkaline sandy loam about 7 inches thick. The upper part of the subsoil is brown, mildly alkaline sandy clay loam about 10 inches thick. The lower part of the subsoil is grayish brown, moderately alkaline sandy clay loam about 7 inches thick. The substratum is grayish brown, strongly alkaline sandy clay loam to 60 inches or more.

The soil is moderately permeable. Available water capacity for the profile is 8.0 to 9.5 inches. Effective rooting depth is 60 inches or more. Typically, the soil has many fine and very fine roots to 3 inches; many very fine, fine, and medium roots to 7 inches; few fine and medium roots to 12 inches; and very few fine roots to 17 inches.

The Tresano soils are used for rangeland and wildlife habitat.

The representative profile is located in the NE$\frac{1}{4}$, SW$\frac{1}{4}$, Sec. 24, T. 30 N., R. 109 W.

A11	0-3 inches	Grayish brown (10YR 5/2) sandy loam, dark grayish brown (10YR 4/2) moist; moderate fine crumb structure; soft, very friable, slightly sticky, slightly plastic; many very fine and fine roots; mildly alkaline, pH 7.4; clear smooth boundary.
A12	3-7 inches	Grayish brown (10YR 5/2) sandy loam, dark grayish brown (10YR 4/2) moist; strong coarse crumb structure; soft, very friable, slightly sticky, slightly plastic; many very fine, fine, and medium roots; mildly alkaline, pH 7.4; clear smooth boundary.
B21t	7-12 inches	Brown (7.5YR 5/2) sandy clay loam, dark brown (7.5YR 4/2) moist; moderate medium prismatic parting to moderate medium angular blocky structure; hard, firm, sticky, plastic; few fine and medium roots; thin nearly continuous waxy coatings on ped faces; mildly alkaline, pH 7.6; abrupt smooth boundary.

B22t 12-17 inches Brown (7.5YR 5/2) sandy clay loam, dark brown (7.5YR 4/2) moist; moderate medium angular blocky structure; hard, firm, sticky, plastic; few fine roots; thin nearly continuous waxy coatings on ped faces; mildly alkaline, pH 7.6; clear smooth boundary.

B3ca 17-24 inches Grayish brown (10YR 5/2) sandy clay loam, dark grayish brown (10YR 4/2) moist; weak medium angular blocky structure; slightly hard, friable, sticky, plastic; thin patchy waxy coatings on some ped faces; effervescent, few fine and medium seams and soft masses of calcium carbonate; moderate alkaline, pH 8.4; gradual wavy boundary.

C1ca 24-60 inches Grayish brown (10YR 5/2) sandy clay loam, dark grayish brown (10YR 4/2) moist; massive; slightly hard, friable, sticky, plastic; violently effervescent, few fine and medium seams and soft masses of calcium carbonate; strongly alkaline, pH 8.6.

Range in Characteristics: Depth to calcareous material usually ranges from 14 to 28 inches. Thickness of solum ranges from 16 to 28 inches. Content of very fine gravel ranges from 5 to 15 percent throughout.

The hue of the A1 horizon is 2.5Y or 10YR. The value is 5 or 6 dry and 4 or 5 moist. The chroma is 2 or 3 dry and moist. The texture is typically a sandy loam but may range from sandy loam to very fine sandy loam. Reaction is neutral or mildly alkaline.

The hue of the B2t horizon is 10YR or 7.5YR. The value is 5 or 6 dry and 4 or 5 moist. The chroma is 2 or 3 dry and moist. The texture is sandy clay loam with clay content of from 28 to 34 percent and less than 35 percent of fine sand or coarser. Reaction is neutral or mildly alkaline.

The hue of the B3ca horizon is 2.5Y or 10YR. The value is 5 or 6 dry and 4 or 5 moist. The chroma is 2 or 3 dry and moist. The texture is sandy clay loam with clay content ranging from 20 to 28 percent. Reaction is moderately alkaline or strongly alkaline.

The hue of the Cca horizon is 2.5Y or 10YR. The texture ranges from sandy loam to sandy clay loam. Reaction is moderately alkaline or strongly alkaline.

The Tresano soils are mapped in complex with the DeBone soils.

VIBLE SERIES

The Vible series are well drained soils. They formed in sandy alluvium on alluvial fans. Slopes are 0 to 3 percent. Elevation is 7,000 to 7,300 feet. Vegetation is big sagebrush, needleandthread, thickspike wheatgrass, and Indian ricegrass. Precipitation is 10 to 12 inches, and the mean annual air temperature is about 36°F. The growing season is about 80 to 90 days, but frost may occur in any month.

In a representative profile the surface layer is pale brown, neutral sandy loam about 3 inches thick. The underlying layer is yellowish brown to brown, neutral sandy loam about 13 inches thick. The substratum is pale brown, neutral to mildly alkaline, coarse sand to 60 inches or more.

The soil is rapidly permeable. Available water capacity for the profile is 3.5 to 4.75 inches. Effective rooting depth is 60 inches or more. Typically, the soil has many very fine and fine roots to 10 inches, few fine roots to 14 inches, and a few very fine roots to 25 inches.

The Vible soils are used for rangeland and wildlife habitat.

The representative profile is located near the center of Sec. 13, T. 31 N., R. 109 W.

A1	0-3 inches	Pale brown (10YR 6/3) sandy loam, dark yellowish brown (10YR 4/4) moist; weak medium crumb structure; soft, very friable, nonsticky, nonplastic; many very fine and fine roots; neutral, pH 6.8; clear smooth boundary.
C1	3-10 inches	Yellowish brown (10YR 5/4) sandy loam, dark yellowish brown (10YR 4/4) moist; weak medium subangular blocky structure; slightly hard, very friable, slightly sticky, slightly plastic; many very fine and fine roots; neutral, pH 7.2; clear smooth boundary.
C2	10-16 inches	Brown (10YR 5/3) sandy loam, dark brown (10YR 4/3) moist; weak medium subangular blocky structure; slightly hard, very friable, nonsticky, nonplastic; few fine roots; 12 percent very fine gravel; neutral, pH 7.2; clear smooth boundary.
C3	16-25 inches	Pale brown (10YR 6/3) coarse sand, dark yellowish brown (10YR 4/4) moist; single grained; loose, nonsticky, nonplastic; very few roots; 12 percent very fine gravel; neutral, pH 7.0; gradual wavy boundary.
C4	25-42 inches	Pale brown (10YR 6/3) coarse sand, dark brown (10YR 4/3) moist; single grained; loose, nonsticky, nonplastic; 12 percent very fine gravel; neutral, pH 7.0; gradual wavy boundary.
C5	42-60 inches	Pale brown (10YR 6/3) coarse sand, dark brown (10YR 4/3) moist; single grained; loose, nonsticky, nonplastic; 15 percent very fine gravel; mildly alkaline, pH 7.4.

Range in Characteristics: These soils are typically noncalcareous throughout, but some pedons have thin lenses of calcareous materials at depths of 50 to 60 inches.

The hue of the A1 horizon is 2.5Y or 10YR. The value is 5 or 6 dry and 4 or 5 moist. The chroma is 3 or 4 dry and moist. The texture is sandy loam or fine sandy loam. Content of very fine gravel is 5 to 15 percent. Reaction is slightly acid or neutral.

The hue of the C horizon is 2.5Y or 10YR. Content of very fine gravel is 10 to 15 percent. Reaction is neutral or mildly alkaline.

Vible sandy loam (263) - This soil occupies broad, nearly level alluvial fans on the benches above the Newfork River. The profile of this soil is the same as the profile described under the respective series heading. Included in mapping are about 20 percent Cothran soils and about 10 percent Ryark soils.

The runoff is slow and erosion hazard is slight to moderate. Wind erosion hazard is severe.

The Vible soils are used for rangeland and wildlife habitat. Sandy (10 to 14 inch precipitation zone) rangesite.

YOUJAY SERIES

The Youjay series are well drained soils. They formed in residuum from strongly alkaline shale on ridges and sidehills. Slopes are 3 to 30 percent. Elevation is 6,800 to 7,000 feet. Vegetation is big sagebrush, needleleaf sedge, and thickspike wheatgrass. Precipitation is 7 to 9 inches, and the mean annual air temperature is about 36°F. The growing season is about 80 to 90 days, but frost may occur in any month.

In a representative profile the surface layer is light gray, mildly alkaline sandy loam about 1 inch. The subsoil is very strongly alkaline clay loam about 13 inches thick. In sequence from the top the upper 4 inches are brown, the next 3 inches are light olive brown, and the lower 6 inches are olive. Soft, strongly alkaline shale occurs at 14 inches.

The soil is slowly permeable. Available water capacity for the profile is 0.75 to 2.25 inches. Effective rooting depth is 10 to 20 inches. Typically, the soil has few fine and very fine roots to 5 inches and very few roots to 8 inches.

The Youjay soils are used for rangeland and wildlife habitat.

The representative profile is located in the SW¼, NE¼, Sec. 32, T. 31 N., R. 108 W.

A2	0-1 inch	Light gray (10YR 7/1) sandy loam, dark grayish brown (10YR 4/2) moist; fine porous crust; slightly hard, very friable, nonsticky, nonplastic; few very fine and fine roots; mildly alkaline, pH 7.8; abrupt smooth boundary.
B21t	1-5 inches	Brown (10YR 5/3) clay loam, dark brown (10YR 4/3) moist; moderate fine columnar parting to strong fine angular blocky structure; hard, firm, sticky, plastic; few very fine and fine roots; thin continuous waxy coatings on all ped faces; very strongly alkaline, pH 9.2; clear smooth boundary.
B22tca	5-8 inches	Light olive brown (2.5Y 5/4) clay loam, olive brown (2.5Y 4/4) moist; moderate fine prismatic parting to moderate fine angular blocky structure; hard, firm, sticky, plastic; very few roots; thin patchy waxy coatings on ped faces;

		effervescent, many fine seams and soft masses of calcium carbonate; very strongly alkaline, pH 9.4; clear smooth boundary.
B3ca	8-14 inches	Olive (5Y 5/3) clay loam, olive (5Y 4/3) moist; weak fine and medium angular blocky structure; slightly hard, firm, sticky, plastic; thin discontinuous waxy coatings on ped faces; violently effervescent, many medium and fine seams and soft masses of calcium carbonate; very strongly alkaline, pH 9.4; gradual wavy boundary.
C	14 inches	Olive, soft, calcareous, strongly alkaline shale.

Range in Characteristics: Depth to bedrock ranges from 10 to 20 inches. Depth to calcareous materials ranges from 3 to 6 inches. Thickness of solum ranges from 8 to 15 inches. Content of gravel is 0 to 5 percent.

The hue of the A2 horizon is 2.5Y or 10YR. The value is 6 or 7 dry and 4 or 5 moist. The chroma is 1 or 2 dry and moist. The texture ranges from sandy loam to very fine sandy loam. Reaction is mildly alkaline or moderately alkaline.

The hue of the B2t horizon is 2.5Y or 10YR. The value is 5 or 6 dry and 4 or 5 moist. The chroma is 2 or 3 dry and moist. The texture is clay loam or silty clay loam with a clay content of 38 to 44 percent. The exchangeable sodium percentage is 15 to 30 percent.

The hue of the B3ca horizon ranges from 5Y to 10YR. The texture is loam or clay loam with a clay content of 24 to 30 percent. The exchangeable sodium percentage is 15 to 30 percent.

The Youjay soils are mapped with the Fraddle, Hatermus, Haterton, and Ouard soils.

USE AND MANAGEMENT OF THE SOILS

This section explains the land capability classification of the Soil Conservation Service and discusses the use and management of the soils of the Blue Rim area for rangeland, engineering uses, and recreation.

Capability Grouping

Capability grouping shows, in a general way, the suitability of soils for most kinds of field crops. The groups are made according to the limitations of the soils when used for field crops, the risk of damage when they are used, and the way they respond to treatment. The grouping does not take into account major and generally expensive landforming that would change slope, depth, or other characteristics of the soils; does not take into consideration possible but unlikely major reclamation projects; and does not apply to crops requiring special management.

Those familiar with the capability classification can infer from it much about the behavior of soils when used for other purposes, but this classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for range, for forest trees, or engineering.

In the capability system all kinds of soils are grouped at three levels--the capability class, subclass, and unit. These are discussed in the following paragraphs.

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 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, require special conservation practices, or both.

Class IV soils have very severe limitations that reduce the choice of plants, 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 largely to pasture, range, woodland, or wildlife.

Class VI soils have severe limitations that make them generally unsuited to cultivation and limit their use largely to pasture or range, woodland, or wildlife.

Class VII soils have very severe limitations that make them unsuited to cultivation and that restrict their use largely to pasture or range, woodland or wildlife.

Class VIII soils and landforms have limitations that preclude their use for commercial plants and restrict their use to recreation, wildlife, water supply, or to esthetic purposes.

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

In class I there are no subclasses because the soils of this class have few limitations. Class V can contain, at the most, only the subclasses indicated by w, s, and c because the soils in class V are subject to little or no erosion though they have other limitations that restrict their use largely to pasture, range, woodland, wildlife, or recreation.

CAPABILITY UNITS are soil groups within the subclasses. The soils in one capability unit are enough alike to be suited to the same crops and pasture plants to require similar management and to have similar productivity and other responses to management. Thus, the capability unit is a convenient grouping for making many statements about management of soils. Capability units are generally designated by adding an Arabic numeral to the subclass symbol; for example, IVe2 or VIe5. Thus, in one symbol the Roman numeral designates the capability class or degree of limitation, the small letter indicates the subclass or kind of limitation as defined in the foregoing paragraph, and the Arabic numeral specifically identifies the capability unit within each subclass.

The land capability classification for each mapping unit is shown in the Guide to Mapping Units and in the appropriate soil survey interpretation sheets. Mapping units designated as complexes are given a single land capability classification, but the land capability classification for components of other multiple soil units is given individually.

Range Sites and Condition Classes[1/]

Different kinds of soil vary in their capacity to produce grass, forbs, and brush. Soils that produce about the same kinds and amounts of herbage within the same precipitation zone make up a range site.

Range sites are kinds of rangeland that differ in their ability to produce vegetation. The soils of any one range site produce about the same kind of climax vegetation. Climax vegetation is the stabilized plant community; it reproduces itself and does not change as long as the environment remains unchanged. Throughout the prairie and the plains the climax vegetation consists of the plants that

1/Perry D. Gruhlkey, Range Conservationist, Soil Conservation Service, assisted with this section and made the range inventory in the field.

were growing there when the region was first settled. If cultivated crops are not grown, the most productive combination of forage plants on a rangesite is generally the climax vegetation.

Decreasers are plants in the climax vegetation that tend to decrease in relative amount under close grazing. They generally are the tallest and most productive perennial grasses and forbs and the most palatable to livestock.

Increasers are plants in the climax vegetation that increase in relative amount as the more desirable decreaser plants are reduced by close grazing. They are commonly shorter than decreasers and are generally less palatable to livestock.

Invaders are plants that cannot compete with plants in the climax plant community for moisture, nutrients, and light. Hence, invaders come in and grow along with increasers after the climax vegetation has been reduced by grazing. Many are annual weeds, some are shrubs that have some grazing value, but others have little value for grazing.

Four range condition classes are used to indicate the degree of departure from the potential, or climax, vegetation brought about by grazing or other uses. The classes show the present condition of the native vegetation on a rangesite in relation to the native vegetation that could grow there.

A range is in excellent condition if 76 to 100 percent of the vegetation is of the same kind as that in the climax stand. It is in good condition if the percentage is 51 to 75, in fair condition if the percentage is 26 to 50, and in poor condition if the percentage is less than 25.

Range condition is judged according to standards that apply to the particular rangesite. It expresses the present kind and amount of vegetation in relation to the climax plant community for that site.

Potential forage production depends on the rangesite. Current forage production depends on the range condition and the moisture available to plants during their growing season.

A primary objective of good range management is to keep rangeland in excellent or good condition. If this is done, water is conserved, yields are improved, and the soils are protected. The problem is recognizing important changes in the kind of cover on a rangesite. These changes take place gradually and can be misinterpreted or overlooked. Growth encouraged by heavy rainfall may lead to the conclusion that the range is in good condition when actually the cover is weedy and the long-term trend is toward lower production. On the other hand, some rangeland that has been closely grazed for short periods under the supervision of a careful manager may have a degraded appearance that temporarily conceals its quality and ability to recover.

Descriptions of Rangesites

In the following pages the soils or range sites of the Blue Rim area are described, and the climax plants and principal invaders on the sites are named. Also given is an estimate of the potential annual yield of air-dry herbage for each site when it is in excellent condition, in years with above average growing conditions, and in years with poor growing conditions. Also included is

a statement about the feasibility of range improvement in each precipitation zone. The soils in each site can be determined by referring to the "Guide to Mapping Units" at the back of this soil survey.

Feasibility of Range Improvements for 10 to 14 Inch Precipitation Zone

Proper grazing use, deferred grazing, and planned grazing systems are feasible on all sites in this precipitation zone. To achieve these practices the following improvements should be considered:

1. Stockwater Development

   Stockwater in this area is limited and needs improvement. There is a potential for numerous ponds to be developed to serve for livestock and wildlife and fish ponds. Ponds are most suited to Clayey, Dense Clay, Loamy, Overflow, and Saline Subirrigated rangesites. There is a potential for wells where ponds are not feasible. Water developed in this area can be piped to areas at lower elevations. Water should be developed so livestock do not travel over one mile to water.

2. Fencing

   Fencing is feasible on all sites for livestock distribution and to permit implementation of planned grazing systems. The movement of antelope in the area should be considered in locating and designing fences.

3. Brush Control

   Brush control is feasible on Sandy, Loamy, Clayey, Shallow Loamy, and Shallow Clayey rangesites where big and low sagebrush are over 30 percent of the total composition. With proper planning and consideration of sage grouse habitat most of the area in the above sites could be sprayed to improve vegetative composition and ground cover without detriment to wildlife habitat.

4. Seeding

   Areas of Loamy and Clayey rangesites could be seeded to tame species for use as specialized pastures. If seeding tame species, crested wheatgrass would be most adapted.

5. Water Spreading

   Where water runoff is plentiful, water spreading systems can be developed on selected areas of Loamy, Clayey, and Dense Clay rangesites.

Clayey (10 to 14 inch precipitation zone) rangesite.

This rangesite consists of well drained soils with thin sandy loam or fine sandy loam surface layers and clay or silty clay subsoils. Slopes are 3 to 15 percent. Precipitation is 10 to 12 inches. The soils are slowly to moderately slowly permeable. Available water capacity is 1.4 to 8.25 inches.

Potential vegetation in excellent condition consists of about 65 percent of the following decreaser species: thickspike wheatgrass, bottlebrush squirreltail, Indian ricegrass, mutton bluegrass, and Letterman needlegrass; and about 35 percent of the following increaser species: prairie junegrass, Sandberg bluegrass, big sagebrush, and low sagebrush. If range condition deteriorates, woody plants and invading species become more dominant. The principal invaders are annuals (bushy birdsbeak).

In excellent condition this site produces about 1,400 pounds of air-dry herbage per acre in years with above average growing conditions and 600 pounds per acre in years with poor growing conditions.

Dense Clay (10 to 14 inch precipitation zone) rangesite.

This rangesite consists of well drained soils that are very strongly alkaline. The soils have thin sandy loam to clay loam surface layers and sandy clay to clay subsoils. Slopes are 3 to 15 percent. Precipitation is 10 to 12 inches. The soils are slowly permeable. Available water capacity is 1.0 to 5.5 inches.

Potential vegetation in excellent condition consists of about 65 percent of the following decreaser species; western wheatgrass, mutton bluegrass, bottlebrush squirreltail, and winterfat; and about 35 percent of the following increaser species; Sandberg bluegrass, phlox, and low sagebrush.

If range condition deteriorates, low sagebrush, rabbitbrush, and increasing forbs become more dominant. The principal invaders are annuals.

In excellent condition this site will produce about 1,000 pounds of air-dry herbage per acre in years with above-average growing conditions, and 450 pounds in years with poor growing condition.

Loamy (10 to 14 inch precipitation zone) rangesite.

This rangesite consists of well drained soils with sandy loam or clay loam surface layers and sandy clay loam or clay loam subsoils. Slopes are 0 to 20 percent. Precipitation is 10 to 12 inches. The soils are moderately permeable. Available water capacity is 2.5 to 11.0 inches.

Potential vegetation in excellent condition consists of about 50 percent of the following decreaser species: needleandthread, bluebunch wheatgrass, Canby bluegrass, Letterman needlegrass, Indian ricegrass, spike fescue, and mutton bluegrass; and about 50 percent of the following increaser species: thickspike wheatgrass, big sagebrush, Hoods phlox, Sandberg bluegrass, prairie junegrass, and low rabbitbrush. If range condition deteriorates, big sagebrush, Sandberg bluegrass, and invading species become more dominant. The principal invaders are annuals and pricklypear cactus.

In excellent condition this site will produce about 1,500 pounds of air-dry herbage per acre in years with above-average growing conditions and 700 pounds per acre in years with poor growing conditions.

Overflow (10 to 14 inch precipitation zone) rangesite.

This rangesite consists of well drained soils that receive additional moisture from stream overflow or from adjacent slopes. The soils have loam or sandy loam surface layers and stratified sandy loam or loam underlying layers. Slopes are 0 to 3 percent. Precipitation is 10 to 12 inches. The soils are moderately rapid to moderately permeable. Available water capacity is 7.75 to 11.0 inches.

Potential vegetation in excellent condition consists of about 45 percent of the following decreaser species: basin wildrye, slender wheatgrass, needleandthread, Letterman needlegrass, and Canby bluegrass; and about 55 percent of the following increaser species: western wheatgrass, big sagebrush, eriogonum, low rabbitbrush, Sandberg bluegrass, and prairie junegrass. If range deteriorates, sagebrush, rabbitbrush, western wheatgrass, and invading species become more dominant. The principal invading plants are annuals and rubber rabbitbrush.

In excellent condition this site will produce about 2,200 pounds of air-dry herbage per acre in years with above-average growing conditions and 1,200 pounds per acre in years with poor growing conditions.

Saline Subirrigated (10 to 14 inch precipitation zone) rangesite.

This rangesite consists of somewhat poorly drained soils that are moderately to strongly saline and have a fluctuating water table in the root zone during most of the growing season. The soils have sandy loam or loam surface layers and stratified sandy loam or loam underlying layers. Slopes are 0 to 3 percent. Precipitation is 10 to 12 inches. Permeability is moderate to moderately rapid. Available water capacity is 3.5 to 5.5 inches. Depth to seasonal water table varies from near the surface to about 40 inches.

Potential vegetation in excellent condition consists of about 60 percent of the following decreaser species: alkali sacaton, basin wildrye, Nuttall alkaligrass, and alkali bluegrass; and about 40 percent of the following increaser species: inland saltgrass, greasewood, and arrowgrass. If range conditions deteriorate, greasewood and inland saltgrass become more dominant. The principal invader is foxtail barley.

In excellent condition this site will produce about 3,400 pounds of air-dry herbage per acre in years with above average growing conditions and 2,500 pounds per acre in years with poor growing conditions.

Sands (10 to 14 inch precipitation zone) rangesite.

This rangesite consists of well drained soils with fine sand surface layers and loamy fine sand underlying layers. Slopes are 3 to 6 percent. Precipitation is 10 to 12 inches. The soils are rapidly permeable. Available water capacity is 2.5 to 5.0 inches.

Potential vegetation in excellent condition consists of about 60 percent of the following decreaser species: needleandthread, thickspike wheatgrass, bottlebrush squirreltail, Indian ricegrass, and bluebunch wheatgrass; and about 40 percent of the following increaser species: threadleaf sedge, big sagebrush, Sandberg bluegrass, prairie junegrass, and phlox. If range condition deteriorates,

woody species and invaders become more dominant. The principal invaders are annuals.

In excellent condition this site will produce about 1,700 pounds of air-dry herbage per acre in years with above-average growing conditions and 900 pounds per acre in years with poor growing conditions.

Sandy (10 to 14 inch precipitation zone) rangesite.

This rangesite consists of well drained soils with sandy loam or loamy sand surface layers and sandy loam subsoils or underlying layers. Slopes are 0 to 15 percent. Precipitation is 10 to 12 inches. The soils are moderately rapid to rapidly permeable. Available water capacity is 2.25 to 5.25 inches.

Potential vegetation in excellent condition consists of about 60 percent of the following decreaser species: needleandthread, bottlebrush squirreltail, Indian ricegrass, Canby bluegrass, and bluebunch wheatgrass; and about 40 percent of the following increaser species: thickspike wheatgrass, big sagebrush, threadleaf sedge, prairie junegrass, and low rabbitbrush. If range condition deteriorates, big sagebrush and invading species become more dominant. The principal invaders are annuals, thistles, and broom snakeweed.

In excellent condition this site will produce about 1,500 pounds of air-dry herbage per acre in years with above-average growing conditions and 700 pounds per acre in years with poor growing conditions.

Shallow Clayey (10 to 14 inch precipitation zone) rangesite.

This rangesite consists of well drained soils that are underlain by bedrock at depths of 10 to 20 inches. The soils have sandy loam surface layers and sandy clay subsoils. Slopes are 10 to 30 percent. Precipitation is 10 to 12 inches. The soil is slowly permeable. Available water capacity is 0.70 to 3.25 inches.

Potential vegetation in excellent condition consists of 65 percent of the following decreaser species: bluebunch wheatgrass, bottlebrush squirreltail, Indian ricegrass, and mutton bluegrass; and about 35 percent of the following increaser species: Sandberg bluegrass, prairie junegrass, winterfat, low sagebrush, and phlox. If range condition deteriorates, increasing forbs (woody aster and goldenweed) and low sagebrush become more dominant. The principal invaders are annuals.

In excellent condition this site will produce 1,000 pounds of air-dry herbage per acre in years with above-average growing conditions and 500 pounds per acre in years with poor growing conditions.

Shallow Loamy (10 to 14 inch precipitation zone) rangesite.

This rangesite consists of well drained soils that are underlain by bedrock at depths of 10 to 20 inches. The soils have thin sandy loam surface layers and sandy clay loam subsoils. Slopes are 6 to 30 percent. Precipitation is 10 to 12 inches. The soils are moderately permeable. Available water capacity is 1.25 to 3.25 inches.

Potential vegetation in excellent condition consists of 65 percent of the following decreaser species: bluebunch wheatgrass, thickspike wheatgrass, Indian ricegrass, Letterman needlegrass, needleandthread, and bottlebrush squirreltail; and about 35 percent of the following increaser species: Sandberg bluegrass, prairie junegrass, big sagebrush, goldenweed, and phlox. If range condition deteriorates, increasing forbs such as goldenweed and phlox become more dominant. The principal invaders are annuals and dandelions.

In excellent condition this site will produce about 1,200 pounds of air-dry herbage per acre in years with above-average growing conditions and 700 pounds per acre in years with poor growing conditions.

Shallow Sandy (10 to 14 inch precipitation zone) rangesite.

This rangesite consists of somewhat excessively drained soils that are underlain by bedrock at depths of 10 to 20 inches. The soils have sandy loam surface layers and gravelly sandy loam underlying layers. Slopes are 10 to 30 percent. Precipitation is 10 to 12 inches. The soils have moderately rapid permeability. Available water capacity is 0.75 to 2.0 inches.

Potential vegetation in excellent condition consists of about 65 percent of the following decreaser species: Indian ricegrass, needleandthread, bluebunch wheatgrass, and thickspike wheatgrass; and about 35 percent of the following increaser species: needleleaf sedge, Sandberg bluegrass, low rabbitbrush, and big sagebrush. If range conditions deteriorate, big sagebrush and increaser forbs become more dominant.

In excellent condition this site will produce about 1,200 pounds of air-dry herbage per acre in years of above-average growing conditions and 700 pounds per acre in years with poor growing conditions.

Feasibility of Range Improvements for 7 to 9 Inch Precipitation Zone

Proper grazing use, deferred grazing, and planned grazing systems are feasible on all sites in this precipitation zone. To achieve these practices the following improvements should be considered:

1. Stockwater Development

   Stockwater at present is extremely limited in this precipitation zone. Since primary grazing use is in the spring, stockwater should be located so livestock do not travel over 1 mile to water.

   Indications from geologic information are that ground water is limited. Where possible, stockwater wells are practical and apply to all rangesites. Distribution of the well water can be made with the use of pipelines. Also, water can be piped into this precipitation zone from higher elevations and precipitation zones.

   Ponds and pits are most practical for spring and early summer grazing use and are feasible on the following rangesites: Loamy, Dense Clay, and Saline Upland.

2. Fencing

Fencing is feasible on all sites for distribution of livestock and to permit implementation of planned grazing systems. Antelope travel patterns should be considered when locating and designing fencing.

3. Brush Control

On sandy and loamy rangesites with 30 percent or more composition of big sagebrush, brush control is feasible. Because of the amount and variety of shrubby species in this zone, the above sites could be sprayed to improve vegetative composition and ground cover without detriment to wildlife habitat.

Dense Clay (7 to 9 inch precipitation zone) rangesite.

This rangesite consists of well drained soils that are very strongly alkaline. The soils have thin sandy loam to clay loam surface layers and sandy clay to clay underlying layers or subsoils. Slopes are 3 to 10 percent. Precipitation is 7 to 9 inches. The soils are slowly to very slowly permeable. Available water capacity is 0.75 to 3.5 inches.

Potential vegetation in excellent condition consists of about 65 percent of the following decreaser species: western wheatgrass, bud sagebrush, Indian ricegrass, and winterfat; and about 35 percent of the following increaser species: Sandberg bluegrass, phlox, and low sagebrush. If range condition deteriorates, low sagebrush and increasing forbs become more dominant. The principal invaders are annuals.

In excellent condition this site produces about 600 pounds of air-dry herbage per acre in years with above-average growing conditions and 250 pounds per acre in years with poor growing conditions.

Loamy (7 to 9 inch precipitation zone) rangesite.

This rangesite consists of well drained soils with sandy loam surface layers and sandy clay loam subsoils. Slopes are 3 to 20 percent. Precipitation is 7 to 9 inches. The soils are moderately to slowly permeable. Available water capacity is 2.25 to 9.5 inches. The Glenderson soils are included in this rangesite.

Potential vegetation in excellent condition consists of about 45 percent of the following decreaser species: bluebunch wheatgrass, needleandthread, prairie junegrass, and winterfat; and about 55 percent of the following increaser species: thickspike wheatgrass, big sagebrush, low rabbitbrush, and Sandberg bluegrass. If range condition deteriorates, big sagebrush and annuals become more dominant. The principal invaders are annuals.

In excellent condition this site produces about 600 pounds of air-dry herbage per acre in years with above-average growing conditions and 300 pounds per acre in years with poor growing conditions.

Saline Lowland (7 to 9 inch precipitation zone) rangesite.

This site consists of well drained soils that are moderately to strongly saline or very strongly alkaline. The surface layers and underlying layers or subsoils are variable in texture. Slopes are 3 to 10 percent. Precipitation is 7 to 9 inches. The soils are moderately to very slowly permeable. Available water capacity is 1.0 to 5.5 inches. Depth to water table is more than 40 inches.

Potential vegetation in excellent condition consists of about 55 percent of the following decreaser species: Gardners saltbush, alkali sacaton, bottlebrush squirreltail, and basin wildrye; and about 45 percent of the following increaser species: Sandberg bluegrass, greasewood, inland saltgrass, and rabbitbrush. If range condition deteriorates, greasewood becomes more dominant. Principal invaders are annuals.

In excellent condition this site produces about 2,000 pounds of air-dry herbage per acre in years with above-average conditions and about 800 pounds in years with poor growing conditions.

Saline Upland (7 to 9 inch precipitation zone) rangesite.

This rangesite consists of well drained soils that are saline and/or alkaline. The soils have loam surface layers and underlying layers. Slopes are 0 to 3 percent. Precipitation is 7 to 9 inches. The soils have moderately slow permeability. Available water capacity is 5.0 to 5.75 inches.

Potential vegetation in excellent condition consists of about 80 percent of the following decreaser species: Gardners saltbush, bud sagebrush, Indian ricegrass, and bottlebrush squirreltail; and about 20 percent of the following increaser species: Sandberg bluegrass, greasewood, and winterfat. If range condition deteriorates, annuals become more dominant and/or ground cover becomes less dense. The principal invaders are annuals.

In excellent condition this site produces about 600 pounds of air-dry herbage per acre in years with above-average growing conditions and 300 pounds per acre in years with poor growing conditions.

Sands (7 to 9 inch precipitation zone) rangesite.

This rangesite consists of well drained soils with fine sand surface layers and loamy fine sand underlying layers. Slopes are 3 to 15 percent. Precipitation is 7 to 9 inches. The soils are rapidly permeable. Available water capacity is 1.2 to 4.0 inches.

Potential vegetation in excellent condition consists of about 50 percent of the following decreaser species: needleandthread, thickspike wheatgrass, Indian ricegrass, and bottlebrush squirreltail; and about 50 percent of the following increaser species: needleleaf sedge, phlox, spiny hopsage, and shadscale. If range conditions deteriorate, the woody species become more dominant. The principal invaders are annuals.

In excellent condition this site produces about 700 pounds of air-dry herbage per acre in years with above-average growing conditions and 350 pounds per acre in years with poor growing conditions.

Sandy (7 to 9 inch precipitation zone) rangesite.

This rangesite consists of well drained soils that have sandy loam or fine sandy loam surface layers and sandy loam subsoils or underlying layers. Slopes are 0 to 10 percent. Precipitation is 7 to 9 inches. The soils have moderately rapid permeability. Available water capacity is 2.25 to 5.75 inches.

Potential vegetation in excellent condition consists of about 55 percent of the following decreaser species: needleandthread, Indian ricegrass, and Canby bluegrass; and about 45 percent of the following increaser species: thickspike wheatgrass, big sagebrush, rabbitbrush, and Sandberg bluegrass. If range condition deteriorates, big sagebrush becomes more dominant. The principal invaders are thistles and other annuals.

In excellent condition this site produces about 600 pounds of air-dry herbage per acre in years with above-average growing conditions and 300 pounds per acre in years with poor growing conditions.

Shale (7 to 9 inch precipitation zone) rangesite.

This site consists of intermingled barren shale and soils that are less than 10 inches deep. The soils are well to somewhat excessively drained and have silty clay to clay surface layers and underlying layers. Slopes are 6 to 30 percent. Precipitation is 7 to 9 inches. Permeability of the soils is slow to very slow. Available water capacity is .25 to 1.5 inches.

Potential vegetation in excellent condition consists of about 80 percent of the following decreaser species: Gardners saltbush, thickspike wheatgrass, bottlebrush squirreltail, Indian ricegrass, and winterfat; and about 20 percent of the following increaser species: birdfoot sagebrush, phlox, and spineless horsebrush. If range condition deteriorates, birdfoot sagebrush, woody aster, and annuals become more dominant. The principal invaders are halogeton and other annuals.

In excellent condition this site produces about 350 pounds of air-dry herbage per acre in years with above-average growing conditions and about 150 pounds per acre in years with poor growing conditions.

Shallow Clayey (7 to 9 inch precipitation zone) rangesite.

This rangesite consists of well drained soils that are underlain by bedrock at depths of 10 to 20 inches. The soils have thin sandy loam surface layers and clay loam subsoils. Slopes are 3 to 30 percent. Precipitation is 7 to 9 inches. The soils are slowly permeable. Available water capacity for the profile is 0.75 to 2.25 inches.

Potential vegetation in excellent condition consists of about 60 percent of the following decreaser species: thickspike wheatgrass, bottlebrush squirreltail, bud sagebrush, Indian ricegrass, and Gardner saltbush; and about 40 percent of

the following increaser species: Sandberg bluegrass, low sagebrush, winterfat, big sagebrush, and forbs. If range condition deteriorates, increasing forbs and low sagebrush become more dominant. The principal invaders are annuals.

In excellent condition this site will produce 450 pounds of air-dry herbage per acre in years with above-average growing conditions and 200 pounds per acre in years with poor growing conditions.

Shallow Loamy (7 to 9 inch precipitation zone) rangesite.

This rangesite consists of well drained soils that are underlain by bedrock at depths of 10 to 20 inches. The soils have loam, thin sandy loam, or thin fine sandy loam surface layers and loam, sandy clay loam, or clay loam subsoils or underlying layers. Slopes are 3 to 30 percent. Precipitation is 7 to 9 inches. The soils are moderately permeable. Available water capacity is 0.75 to 3.75 inches.

Potential vegetation in excellent condition consists of about 60 percent of the following decreaser species: bluebunch wheatgrass, Indian ricegrass, needleandthread, thickspike wheatgrass, and winterfat; and about 40 percent of the following increaser species: Sandberg bluegrass, big sagebrush, goldenweed, and phlox. If range condition deteriorates, increasing forbs become more dominant. The principal invaders are annuals and dandelions.

In excellent condition this site produces about 450 pounds of air-dry herbage per acre in years with above-average growing conditions and 200 pounds per acre in years with poor growing conditions.

Shallow Sandy (7 to 9 inch precipitation zone) rangesite.

This rangesite consists of well drained soils that are underlain by bedrock at depths of 10 to 20 inches. The soils have sandy loam surface layers and underlying layers. Slopes are 10 to 30 percent. Precipitation is 7 to 9 inches. The soils have moderately rapid permeability. Available water capacity is 1.0 to 2.75 inches.

Potential vegetation in excellent condition consists of about 50 percent of the following decreaser species: Indian ricegrass, needleandthread, thickspike wheatgrass, winterfat, and bottlebrush squirreltail; and about 50 percent of the following increaser species: Sandberg bluegrass, threadleaf sedge, rabbitbrush, and phlox. If range condition deteriorates, increasing forbs become more dominant. The principal invaders are thistles and other annuals.

In excellent condition this site produces about 450 pounds of air-dry herbage per acre in years with above-average growing conditions and 200 pounds per acre in years with poor growing conditions. About 75 percent of this production is from plants which furnish forage for cattle, sheep, horses, and wildlife.

RANGE INVENTORY DATA

During the survey, the soils were identified and the mapping units were set up and tested. The soil scientists and range conservationists studied the vegetation, soil properties, and landscape features to assign a range site to each soil.

Most of the individual sites within the mapping units were checked by the range conservationists to determine the percent composition and to estimate the 1972 yield.

The data pertaining to the soils and range sites within a mapping unit are recorded in Table 2.

ENGINEERING USES OF THE SOILS

This section is useful to those who need information about soils used as structural material or as foundation upon which structures are built. Among those who can benefit from this section are planning commissions, town and city managers, land developers, engineers, contractors, and farmers.

Among properties of soils highly important in engineering are permeability, strength, compaction characteristics, soil drainage condition, shrink-swell potential, grain size, plasticity, and soil reaction. Also important are depth to the water table, depth to bedrock, and soil slope. These properties, in various degrees and combinations, affect construction and maintenance of roads, airports, pipelines, foundations for small buildings, irrigation systems, ponds and small dams, and systems for disposal of sewage and refuse.

Information in this section of the soil survey can be helpful to those who--

1. Select potential residential, industrial, commercial, and recreational areas.

2. Evaluate alternate routes for roads, highways, pipelines, and underground cables.

3. Seek sources of gravel, sand, or clay.

4. Plan farm drainage systems, irrigation systems, ponds, terraces, and other structures for controlling water and conserving soil.

5. Correlate performance of structures already built with properties of the kinds of soil on which they are built for the purpose of predicting performance of structures on the same or similar kinds of soil in other locations.

6. Predict the trafficability of soils for cross-country movement of vehicles and construction equipment.

7. Develop preliminary estimates pertinent to construction in a particular area.

Most of the information in this section is presented in Tables 3, 4, and 5 and in the individual soil survey interpretations sheet for each series, which shows several estimated soil properties significant to engineering and/or interpretations for various engineering uses.

This information along with the field sheets and other parts of this publication can be used to make interpretations in addition to those given in Table 5 and in the interpretive sheets and also can be used to make other useful maps.

This information, however, does not eliminate need for further investigations at sites selected for engineering works, especially works that involved heavy loads or that require excavations to depths greater than those shown in the tables, generally depths greater than 6 feet. Also, inspection of sites,

especially the small ones, is needed because many delineated areas of a given soil mapping unit may contain small areas of other kinds of soil that have strongly contrasting properties and different suitabilities or limitations for soil engineering.

Some of the terms used in this soil survey have special meaning to soil scientists that is not known to all engineers. The Glossary defines many of these terms commonly used in soil science.

Engineering Soil Classification Systems

The two systems most commonly used in classifying samples of soils for engineering are the Unified system used by the SCS engineers, Department of Defense, and others and the AASHO system adopted by the American Association of State Highway Officials(1).

In the Unified system soils are classified according to particle size distribution, plasticity, liquid limit, and organic matter. Soils are grouped in 15 classes. There are eight classes of coarse-grained soils identified as GW, GP, GM, GC, SW, SP, SM, and SC; six classes of fine-grained soils identified as ML, CL, OL, MH, CH, and OH; and one class of highly organic soils identified as Pt. Soils on the borderline between two classes are designated by symbols for both classes; for example, ML-CL.

The AASHO system is used to classify soils according to those properties that affect use in highway construction and maintenance. In this system a soil is placed in one of seven basic groups ranging from A-1 through A-7 on the basis of grain-size distribution, liquid limit, and plasticity index. In group A-1 are gravelly soils of high bearing strength or the best soils for subgrade (foundation). At the other extreme, in group A-7 are clay soils that have low strength when wet and that are the poorest soils for subgrade. Where laboratory data are available to justify a further breakdown, the A-1, A-2, and A-7 groups are divided as follows: A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, and A-7-6. As additional refinement, the engineering value of a soil material can be indicated by a group index number. Group indexes range from 0 for the best material to 20 or more for the poorest. The AASHO classification for tested soils with group index numbers in parentheses is shown in Table 3; the estimated classification without group index numbers is given in Table 4 and in the individual soil survey interpretations sheets for all soils mapped in the survey area.

USDA texture is determined by the relative proportions of sand, silt, and clay in soil material that is less than 2.0 millimeters in diameter. "Sand, silt, clay," and some of the other terms used in the USDA textural classification are defined in the Glossary.

Soil Properties Significant to Engineering

Several estimated soil properties significant in engineering(3) are given in Table 4 and in the interpretive sheets. These estimates are made for typical soil profiles by layers sufficiently different to have different significance for soil engineering. The estimates are based on field observations made in the course of mapping, on test data for these and similar soils, and on experience with the same kinds of soil in other counties. Following are explanations of some of the estimated properties:

Depth to bedrock is distance from the surface of the soil to the upper surface of the rock layer.

Depth to seasonal high water table is distance from the surface of the soil to the highest level that ground water reaches in the soil in most years.

Soil texture is described in the standard terms used by the Department of Agriculture. These terms take into account relative percentages of sand, silt, and clay in soil material that is less than 2 millimeters in diameter. "Loam," for example, is soil material that contains 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the soil contains gravel or other particles coarser than sand, an appropriate modifier is added, as for example, "gravelly loamy sand." "Sand, silt, clay," and some of the other terms used in USDA textural classification are defined in the Glossary of this soil survey. Textural classes are abbreviated on the interpretive sheets.

Liquid limit and plasticity index indicate the effect of water on the strength and consistence of soil material. As the moisture content of a clayey soil is increased from a dry state, the material changes from a semisolid to a plastic state. If the moisture content is further increased, the material changes from a plastic to a liquid state. The plastic limit is the moisture content at which the soil material changes from the semisolid to plastic state and the liquid limit from a plastic to a liquid state. The plasticity index is the numerical difference between the liquid limit and the plastic limit. It indicates the range of moisture content within which a soil material is plastic. Liquid limit and plasticity index are estimated in Table 4 and in the interpretive sheets, but in Table 3 the data on liquid limit and plasticity index are based on tests of soil samples.

Permeability is that quality of a soil that enables it to transmit water or air. It is estimated on basis of those soil characteristics observed in the field, particularly structure and texture. The estimates in Table 4 and in the interpretive sheets do not take into account lateral seepage or such transient soil features as plowpans and surface crusts.

Available water capacity is the ability of soils to hold water for use by most plants. It is commonly defined as the difference between the amount of water in the soil at field capacity and the amount at the wilting point of most crop plants.

Reaction is the degree of acidity or alkalinity of a soil expressed in pH values. The pH value and terms used to describe soil reaction are explained in the Glossary.

Salinity refers to the amount of soluble salts in the soil. It is expressed as the electrical conductivity of the saturation extract in mmhos. per centimeter at 25°C. Salinity affects the suitability of a soil for crop production, its stability when used as construction material, and its corrosiveness to metals and concrete.

Shrink-swell potential is the relative change in volume to be expected of soil material with changes in moisture content; that is, the extent to which the soil shrinks as it dries out or swells when it gets wet. Extent of shrinking

and swelling is influenced by the amount and kind of clay in the soil. Shrinking and swelling of soils causes much damage to building foundations, roads, and other structures. A high shrink-swell potential indicates a hazard to maintenance of structures built in, on, or with material having this rating.

Corrosivity, as used in Table 4 and in the interpretive sheets, pertains to potential soil-induced chemical action that dissolves or weakens uncoated steel or concrete. Rate of corrosion of uncoated steel is related to soil properties such as drainage, texture, total acidity, and electrical conductivity of the soil material. Corrosivity for concrete is influenced mainly by the content of sodium or magnesium sulfate but also by soil texture and acidity. Installations of uncoated steel that intersect soil boundaries or soil horizons are more susceptible to corrosion than installations entirely in one kind of soil or in one soil horizon. A corrosivity rating of low means that there is a low probability of soil-induced corrosion damage. A rating of high means that there is a high probability of damage so that protective measures for steel and more resistant concrete should be used to avoid or minimize damage.

Engineering Interpretations of Soils

The estimated interpretations(3) in Table 5 and in the soil survey interpretations sheets are based on the engineering properties of soils shown in Table 4 and in the section, "Estimated Soil Properties Significant to Engineering," of the interpretive sheets, on test data for soils in this survey area and others nearby or adjoining, and on the experience of engineers and soil scientists with the soils of Sublette County. In Table 5 and in the interpretive sheets ratings are used to summarize limitation or suitability of the soils for all listed purposes other than for drainage of cropland and pasture, irrigation, ponds and reservoirs, embankments, and terraces and diversions. For these particular uses the soil features not to be overlooked in planning, installation, and maintenance are listed.

Soil limitations are indicated by the ratings slight, moderate, and severe. Slight means soil properties generally favorable for the rated use, or in other words, limitations that are minor and easily overcome. Moderate means that some soil properties are unfavorable but can be overcome or modified by special planning and design. Severe means soil properties so unfavorable and so difficult to correct or overcome as to require major soil reclamation, special designs, or intensive maintenance.

Soil suitability is rated by the terms good, fair, and poor, which have, respectively, meanings approximately parallel to the terms slight, moderate and severe.

Following are explanations of some of the items included in the soil survey interpretations sheets and in Table 5.

Septic tank absorption fields are subsurface systems of tile or perforated pipe that distribute effluent from a septic tank into natural soil. The soil material from a depth of 18 inches to 6 feet is evaluated. The soil properties considered are those that affect both absorption of effluent and construction and operation of the system. Properties that affect absorption are permeability, depth to water table or rock, and susceptibility to flooding. Slope is a soil

property that affects difficulty of layout and construction and also the risk of soil erosion, lateral seepage, and downslope flow of effluent. Large rocks or boulders increase construction costs.

Sewage lagoons are shallow ponds constructed to hold sewage within a depth of 2 to 5 feet, long enough for bacteria to decompose the solids. A lagoon has a nearly level floor and sides or embankments of compacted soil material. The assumption is made that the embankment is compacted to medium density and the pond is protected from flooding. Properties are considered that affect the pond floor and the embankment. Those that affect the pond floor are permeability, organic matter, and slope; and if the floor needs to be leveled, depth to bedrock becomes important. The soil properties that affect the embankment are the engineering properties of the embankment material as interpreted from the Unified Soil Classification and the amounts of stone, if any, that influence the ease of excavation and compaction of the embankment material.

Shallow excavations are those that require digging or trenching to a depth of less than 6 feet; as for example, excavations for pipelines, sewer lines, phone and power transmission lines, basements, open ditches, and cemeteries. Desirable soil properties are good workability, moderate resistance to sloughing, gentle slopes, absence of rock outcrops or big stones, and freedom from flooding or a high water table.

Dwellings, as rated in the interpretive sheets, are not more than three stories high and are supported by foundation footings placed in undisturbed soil. The features that affect the rating of a soil for dwellings are those that relate to capacity to support load and resist settlement under load and those that relate to ease of excavation. Soil properties that affect capacity to support load are wetness, susceptibility to flooding, density, plasticity, texture, and shrink-swell potential. Those that affect excavation are wetness, slope, depth to bedrock, and content of stones and rocks.

Sanitary landfill is a method of disposing of refuse in dug trenches. The waste is spread in thin layers, compacted, and covered with soil throughout the disposal period. Landfill areas are subject to heavy vehicular traffic. Some soil properties that affect suitability for landfill are ease of excavation, hazard of polluting ground water, and trafficability. The best soils have moderately slow permeability, withstand heavy traffic, and are friable and easy to excavate. Unless otherwise stated the ratings in the interpretive sheets apply only to a depth of about 6 feet; and, therefore, limitation ratings of slight or moderate may not be valid if trenches are to be much deeper than that. For some soils reliable predictions can be made to a depth of 10 or 15 feet; regardless of that, every site should be investigated before it is selected.

Local roads and streets, as rated in Table 5 and in the interpretive sheets, have an all-weather surface expected to carry automobile traffic all year. They have a subgrade of underlying soil material; a base consisting of gravel, crushed rock, or soil material stabilized with lime or cement; and a flexible or rigid surface, commonly asphalt or concrete. These roads are graded to shed water and have ordinary provisions for drainage. They are built mainly from soil at hand, and most cuts and fills are less than 6 feet deep.

Soil properties that most affect design and construction of roads and streets are load supporting capacity and stability of the subgrade and the workability and quantity of cut and fill material available. The AASHO and Unified classifications of the soil material, and also the shrink-swell potential, indicate traffic supporting capacity. Wetness and flooding affect stability of the material. Slope, depth to hard rock, content of stones and rocks, and wetness affect ease of excavation and amount of cut and fill needed to reach an even grade.

Road fill is soil material used in embankments for roads. The suitability ratings reflect (1) the predicted performance of soil after it has been placed in an embankment that has been properly compacted and provided with adequate drainage and (2) the relative ease of excavating the material at borrow areas.

Sand and gravel are used in great quantities in many kinds of construction. The ratings in Table 5 and in the interpretive sheets provide guidance about where to look for probable sources. A soil rated as a good or fair source of sand or gravel generally has a layer at least 3 feet thick, the top of which is within a depth of 6 feet. The ratings do not take into account thickness of overburden, location of the water table, or other factors that affect mining of the materials and neither do they indicate quality of the deposit.

Topsoil is used for topdressing an area where vegetation is to be established and maintained. Suitability is affected mainly by ease of working and spreading the soil material as for preparing a seedbed, natural fertility of the material or its response of plants when fertilizer is applied, and absence of substances toxic to plants. Texture of the soil material and its content of stone fragments are characteristics that affect suitability, but also considered in the ratings is damage that will result at the area from which topsoil is taken.

Pond reservoir areas hold water behind a dam or embankment. Soils suitable for pond reservoir areas have low seepage, which is related to their permeability and depth to fractured or permeable bedrock or other permeable material.

Embankments, dikes, and levees require soil material resistant to seepage and piping and of favorable stability, shrink-swell potential, shear strength, and compactibility. Presence of stones or organic material in a soil are among factors that are unfavorable.

Drainage of cropland and pasture is affected by such soil properties as permeability, texture, and structure; depth to claypan, rock, or other layers that influence rate of water movement; depth to the water table; slope, stability in ditchbanks; susceptibility to stream overflow; salinity or alkalinity; and availability of outlets for drainage.

Irrigation of a soil is affected by such features as slope; susceptibility to stream overflow, water erosion or soil blowing; soil texture; content of stones; accumulations of salts and alkali; depth of root zone; rate of water intake at the surface; permeability of soil layers below the surface layer and in fragipans or other layers that restrict movement of water; amount of water held available to plants; and need for drainage or depth to water table or bedrock.

TABLE 2 - RANGE INVENTORY DATA

Mapping Unit No.	Mapping Unit Name	Total Acres	Soil Name and Percent		Outstanding Characteristic	Range Site Name	Site	Grasses																Forbs							Woody Plants									Annuals		Total
								Alkali bluegrass	Alkali sacaton	Blue grama	Bottlebrush squirreltail	Canby bluegrass	Indian ricegrass	Inland saltgrass	Letterman needlegrass	Mutton bluegrass	Needleandthread	Needleleaf sedge	Nebraska sedge	Plains reedgrass	Sandberg bluegrass	Slender wheatgrass	Thickspike wheatgrass	Tufted hairgrass	Astragalus	Eriogonum	Goldenweed	Hoods phlox	Nailwort	Prickly gilia	Puseytoes	Sandwort	Big sagebrush	Bud sage	Gardner saltbush	Greasewood	Low rabbitbrush	Low sagebrush	Prickly pear cactus	Rubber rabbitbrush	Shadscale	Winterfat	Bushy birdsbeak	Halogeton	
102	Shale Rock land	2,228	Shale Rockland		Shale	No site assigned																																			
110	Natrargids	616	Natrargids	80	Alkaline	Dense clay, 10 to 14" P. Z.							5							10		25			T		10				5		5		T	30			10			100
112	Rock land-Natrargids complex	816	Rock land	50	Shale	Shale, 7 to 9" P. Z.					5											T											70	25							100
			Natrargids	30	Alkaline	Dense clay, 7 to 9" P. Z.																50				15					10	5	10		10							100
113	Salorthids-Natrargids complex	652	Salorthids & Natrargids	80	Saline & alkaline	Saline lowland, 7 to 9" P. Z.					5									5		10									15	10	25	20				5		5	100
250	Glendive-Havre complex, saline	444	Glendive & Havre saline	40	Saline	Saline subirrig., 10 to 14" P. Z.		10	5					30					15			10		5										25							100
			Glendive sandy loam	20	Sandy	Overflow, 10 to 14" P. Z.		Not inventoried																																		
			Havre loam	20	Loamy	Overflow, 10 to 14" P. Z.		Not inventoried																																		
251	Bluerim-Tigon association	6,700	Bluerim sandy loam	50	Moderately deep	Loamy, 10 to 14" P. Z.	1					T	T		15	5				T	5	20			5		10		T		25				T	15						100
							2				T				5	20				10	5	10					5		5		35				T							100
			Tigon sandy loam	30	Shallow	Shallow loamy, 10 to 14" P. Z.	1						5		5					5	10	25				5	10				25					10						100
							2				T	T	T			5					10	30					10		T		45				T							100
252	Tigon-Bluerim association	8,704	Tigon sandy loam	50	Shallow	Shallow loamy, 10 to 14" P. Z.	1						5								15	20			5	10	10		5		15					10			5			100
							2								5	10				5	15	20			T	15	5				15					10						100
			Bluerim sandy loam	25	Moderately deep	Loamy, 10 to 14" P. Z.	1								15	10					5	15			5		10				40											100
							2						5		15	5					5	10					10				40											100
253	Rallod-Onason-Rock outcrop complex, 10 to 30% slopes	1,628	Rallod sandy loam	35	Shallow	Shallow clayey, 10 to 14" P.Z.						20									5	10					20				20				T	20				5		100
			Onason sandy loam	25	Shallow	Shallow sandy, 10 to 14" P. Z.						5			15						5	5			5			10	10	10	35				T							100
			Rock outcrop	20	Shale	No site assigned																																				
254		334	Combined with mapping unit 256																																						
256	Bluerim, Abston, and Milren soils, 3 to 15% slopes	2,368	Bluerim sandy loam	30	Moderately deep	Loamy, 10 to 14" P. Z.											5				5	25					10				50				T		T		5			100
			Abston sandy loam	25	Alkaline	Clayey, 10 to 14" P. Z.							5								10	20			5		10				20					20		T		10		100
			Milren sandy loam	25	Deep	Clayey, 10 to 14" P. Z.		Not inventoried; vegetation similar to Abston sandy loam.																																			
257	Bluerim-Cotha association	3,340	Bluerim sandy loam	50	Moderately deep	Loamy, 10 to 14" P. Z.	1					5	5			5	10				5	20					5	T	5		40				T							100
							2													10	5	30					10				40				5							100
			Cotha sandy loam	25	Moderately deep	Sandy, 10 to 14" P. Z.	1					5					15	5		5		25					10		5	T	30											100
							2						10				20					10					10			5	40				5							100
258	Forelle-Havre association	1,160	Forelle clay loam	50	Deep	Loamy, 10 to 14" P. Z.													5		10	25					10				35		5		5				5			100
			Havre loam	30	Deep	Overflow, 10 to 14" P. Z.																25					10				70										5		100
259	Ryark-Relsob complex, 3 to 10% slopes	1,208	Ryark loamy sand	45	Deep	Sandy, 10 to 14" P. Z.	1						30				30					10					10		5	T	15							T				100
							2						[illegible]				25					10					10		[illegible]		15											100
			Relsob sandy loam	35	Deep	Loamy, 10 to 14" P. Z.	1					3					10			5	10	20					10		5	T	35				10							100
							2						20				10					55		5			5				5				T		T					100
260	Ryark-Cothran association	2,716	Ryark loamy sand	55	Deep	Sandy, 10 to 14" P. Z.	1		T			T					25			5		10					5	10		35					10				T		100
							2										20					30		5			10				15											100
			Cothran fine sand	25	Deep sands	Sands, 10 to 14" P. Z.	1		5								45					15					T								20		T	10			100
							2										50	10		5		10					10		5									10			100
261	Coalmont-Bluerim complex, 3 to 15% slopes	1,348	Coalmont fine sandy loam	40	Moderately deep	Clayey, 10 to 14" P. Z.	1					5									5	40		5							10				5	30						100
							2					10										90																				100
			Bluerim sandy loam	30	Moderately deep	Loamy, 10 to 14" P. Z.						10					5				5	25			15						35								5			100
262	Cotha-Ryark complex, 3 to 15% slopes	872	Cotha sandy loam	40	Moderately deep	Sandy, 10 to 14" P. Z.		Not inventoried; vegetation similar to Cotha sandy loam of mapping unit 257																																			
			Ryark loamy sand	25	Deep	Sandy, 10 to 14" P. Z.						10				20			5		35		5			10		5		5		5											100
			Bluerim sandy loam	20	Moderately deep	Loamy, 10 to 14" P. Z.						5				5					60		5			10		5	5	10						T						100
263	Vible sandy loam	504	Vible sandy loam	70	Deep	Sandy, 10 to 14" P. Z.				T		15				20				5	10			5		10				35				T		T					100
264	Fluvents	836	Fluvents			Not assigned																																			
351	Laney-Glenderson complex	5,856	Laney loam	50	Alkaline	Saline upland, 7 to 9" P. Z.	1					T				5	10				45					15							10	10		5						100
							2					5					15				40					10							10	10					10			100
			Glenderson sandy loam	20	Alkaline	Loamy, 7 to 9" P. Z.	1					5					15			T	15	35					15		T		20		5		T				5			100
							2					5				10	5				10	20					10		5		30				5							100
352	Fraddle-Ouard complex, 3 to 10% slopes	952	Fraddle sandy loam	40	Moderately deep	Loamy, 7 to 9" P. Z.										10					50					10		5		20					5							100
			Ouard sandy loam	20	Shallow	Shallow loamy, 7 to 9" P. Z.										10				5	35					10				35												100
			Youjay sandy loam	20	Shallow	Shallow clayey, 7 to 9" P. Z.								T		5			5		60		T										5		25						100
354	Fraddle-Littsan association	1,860	Fraddle sandy loam	50	Moderately deep	Loamy, 7 to 9" P. Z.	1						5				5				5	25					10				40					10						100
							2						5				5				5	25					10				25					10						100
			Littsan fine sandy loam	25	Moderately deep	Sandy, 7 to 9" P. Z.							15				20				5	10					5		T		30					5						100
355	--	1,228	Combined with mapping unit 365.																																						
356	Koonich-Laney complex	764	Koonich sandy loam	45	Deep	Sandy, 7 to 9" P. Z.							5								10	25					10				40					10		T				100
			Laney loam	25	Alkaline	Saline upland, 7 to 9" P. Z.							5					5			10	25					15				5	10	10						15			100
357	Rock land-Huguston and Youjay soils, 10 to 30% slopes	2,928	Rock land	30	Shale	Shale, 7 to 9" P. Z.							10								5	15		5	5	20	10	15			5					10						100
			Huguston sandy loam	25	Shallow	Shallow sandy, 7 to 9" P. Z.							T		10		20			5	5	5			10		10					25					10						100
			Youjay sandy loam	20	Shallow	Shallow clayey, 7 to 9" P. Z.															10	25			5	5	10		5			20					5	15					100
359	Rock land-Hatermus complex, 10 to 30% slopes	1,000	Rock land	30	Shale	Shale, 7 to 9" P. Z.					5										5																					100
			Hatermus loam	25	Shallow	Shallow loamy, 7 to 9" P. Z.															15	40					30				15				85	5							100
			Youjay sandy loam	20	Shallow	Shallow clayey, 7 to 9" P. Z.															10	25		5	5		10		5		20					5	15					100
360	DeBone-Tresano complex, 6 to 10% slopes	1,024	DeBone sandy loam	45	Alkaline	Loamy, 7 to 9" P. Z.		Not inventoried; vegetation similar to Tresano sandy loam of mapping unit 360.																																			
			Tresano sandy loam	25	Deep	Loamy, 7 to 9" P. Z.						5				5					5	20					10		5	T	40					5				5		100
361	Fraddle-Haterton association	1,900	Fraddle sandy loam	40	Moderately deep	Loamy, 7 to 9" P. Z.					5	T				15			5		20					5		5		35					5		5				100
			Haterton fine sandy loam	25	Shallow	Shallow loamy, 7 to 9" P. Z.				T		10								5	25		10			15			5							10	10			10		100
			Hatermus loam	20	Shallow	Shallow loamy, 7 to 9" P. Z.		Not inventoried; vegetation similar to Haterton fine sandy loam of mapping unit 361.																																			
365	Littsan-Bodorumpe association	1,876	Littsan fine sandy loam	45	Moderately deep	Sandy, 7 to 9" P. Z.	1				5	5			5		T				30					10		5		40					5						100
							2				5				20		5				10		5			15				40				T		T					100
							3					5			25						20					10				35					5						100
			Bodorumpe fine sand	30	Moderately deep	Sands, 7 to 9" P. Z.	1					15			30	10		5								5		5	5		5				10			10			100
							2					5			40						20					10				5							20			100
							3					20			35	T					10					5				25							5			100

Soil Test Data

Table 3 contains engineering test data for some of the major soil series in the Blue Rim area. These tests were made to help evaluate the soils for engineering purposes. The engineering classifications given are based on data obtained by mechanical analyses and by tests to determine liquid limits and plastic limits.

Compaction (or moisture-density) data are important in earthwork. If a soil material is compacted at successively higher moisture content, assuming that the compactive effort remains constant, the density of the compacted material increases until the optimum moisture content is reached. After that, density decreases with increase in moisture content. The highest dry density obtained in the compactive test is termed maximum dry density. As a rule, maximum strength of earthwork is obtained if the soil is compacted to the maximum dry density.

Tests to determine liquid limit and plastic limit measure the effect of water on the consistence of soil material.

TABLE 3

ENGINEERING TEST DATA FOR SOIL SAMPLES TAKEN FROM 10 SOIL PROFILES

Soil name and location	Parent material	Report No.	Depth	Horizon	Moisture-density		Mechanical analysis					Liquid Limit	Plasticity Index	Classification	
							Percentage passing sieve								
					Maximum Dry Density	Optimum Moist.	No. 4 (4.7 mm.)	No. 10 (2.0 mm.)	No. 40 (0.42 mm.)	No. 60 (0.25 mm.)	No. 200 (0.074 mm.)			AASHO	Unified
			Inches		pcf	Pct.									
Bluerim Center Sec. 25, T30N, R108W	Sandy clay loam materials from sandy shale	72-1087	3-10	B21t	119.2	12.5	99	88	64		32.8	25	9	A-2-4(0)	
Coalmont SE¼, NW¼, Sec. 24, T31N, R109W	Clay loam materials from calcareous shale	72-1091	9-14	B22t	104.0	18.8	100	99	91		59.5	40	21	A-6(9)	
Cothran SE¼, NE¼, Sec. 24, T31N, R109W	Wind born fine sands	72-1092	2-28	C1	110.0	12.7	100	100	70		12.0	NV[1]	NP[2]	A-2-4(0)	
Fraddle Center Sec. 29, T31N, R108W	Sandy loam materials from sandy shales	72-1090	22-33	C1	112.2	15.8	100	99	60		25.2	39	13	A-2-6(0)	
Laney ¼ mile SE of W¼ corner, Sec. 33, T31N, R108W	Medium textured, alkaline, alluvial fans	72-1089	12-36	C2	107.0	17.3	100	100	100		72.5	32	16	A-6(10)	
Littsan SW¼, SW¼, Sec. 36, T31N, R109W	Sandy loam materials wind deposition	72-1093	2-14	B2t	112.8	10.3	100	100	85		30.7	19	2	A-2-4(0)	
Relsob NW¼, SW¼, Sec. 26, T31N, R108W	Sandy clay loam materials locally transported	72-1085	2-16	B2t	126.6	9.6	99	92	66		32.5	20	5	A-2-4(0)	
Ryark SW¼, NE¼, Sec. 26, T31N, R108W	Sandy loam materials of local origin	72-1088	2-18	B2t	125.8	9.2	100	96	63		25.1	17	NP	A-2-4(0)	
Vible Center Sec. 13, T31N, R109W	Sandy loam materials, alluvial fans	72-1086	3-16	C1 & C2	131.2	7.4	99	88	48		25.4	19	4	A-2-4(0)	
Vible Center Sec. 13, T31N, R109W	Very coarse sand, alluvial fans	72-1094	25-42	C3	114.1	9.0	98	89	34		5.0	NV	NP	A-1-b(0)	

1/No liquid limit value
2/NP--nonplastic

TABLE 4 - ESTIMATED SOIL PROPERTIES

Soil Series	Depth (Inches)	USDA* Texture	Unified Classification	AASHO Classification	Fraction >3 Inch (Percent)	Percent of Material Less Than 3-Inch Passing Sieve				Liquid Limit	Plasticity Index	Permeability (In./Hr.)	Available Water Capacity (In./In.)	Soil Reaction (pH)	Salinity (Mmhos/Cm)	Shrink-Swell Potential	Corrosivity		Bedrock		Hydro-logical Group	Potential Frost Action
						4	10	40	200								Steel	Concrete	Depth (In.)	Hardness		
Abston	0-10	c	CL	A-6, A-7	0	90-100	90-100	85-90	70-80	34-45	15-25	.06-.2	.08-.10	6.6-9.0	2.0-4.0	High	High	Low	20-40	Rippable	D	Low
	10-34	scl	CL	A-6	0	90-100	90-100	85-90	55-50	30-40	11-15	.06-.2	.06-.08	8.5->9.0	4.0-8.0	Moderate	High	Moderate				
	34	wb	--	--	--	--	--	--	--													
Bluerim	0-18	scl	SM-SC, SC	A-2, A-6	0	95-100	75-90	60-70	30-40	20-30	5-15	.6-2.0	.14-.16	6.6-7.8	--	Low	High	Low	20-40	Rippable	B	Low
	18-29	sl	SM	A-2	0	95-100	75-90	40-55	20-30	NP	NP	2.0-6.0	.11-.13	7.4-9.0	0-4.0	Low	High	Low				
	29	wb	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--				
Bodorumpe	0-36	lfs, fs	SM	A-2	0	100	100	60-80	15-30	NP	NP	6.0-20.0	.06-.10	6.6-7.8	--	Low	High	Low	20-40	Rippable	A	Low
	36	wb	--	--	--	--	--	--	--	--	--	--	--	--								
Coalmont	0-4	fsl, sl	SM	A-4	0	90-100	90-100	65-80	35-50	NP	NP	2.0-6.0	.12-.14	6.6-7.8	--	Low	High	Low	20-40	Rippable	C	Low
	4-24	cl	CL	A-6	0	90-100	90-100	85-95	55-75	35-45	15-25	.06-.6	.19-.21	6.6-9.0	2.0-4.0	Moderate	High	Low				
	24+	wb	--	--	--	--	--	--	--	--	--											
Cotha	0-34	sl	SM, SM-SC	A-2	0	80-90	75-90	45-65	20-35	15-25	NP-5	2.0-6.0	.11-.13	6.6-7.8	--	Low	High	Low	20-40	Rippable	C	Low
	34	wb	--	--	--	--	--	--	--	--	--											
Cothran	0-60	fs, lfs	SM, SP-SM	A-2	0	90-100	85-100	60-75	10-20	NP	NP	6.0-20.0	.05-.08	6.1-7.8	--	Low	High	Low	>60	--	A	Low
DeBone	0-10	sl, fsl	SM-SC, SC	A-4	0	90-100	90-100	60-75	35-45	10-20	5-10	2.0-6.0	.12-.14	6.6-7.8	--	Low	High	Low	>60	Rippable	D	Low
	10-60	scl	SC	A-6	0	90-100	90-100	80-90	35-50	30-40	11-20	.06-.6	.08-.10	8.5->9.0	2.0-8.0	Moderate	High	Moderate				
Fluvents	0-60	ls-sil	Too variable to estimate.																			
Forelle	0-32	scl	SC	A-6	0-5	95-100	90-100	75-90	35-50	30-40	15-20	.6-2.0	.14-.16	6.6-9.0	--	Moderate	High	Low	>60	--	B	Low
	32-60	cl	CL	A-6	0	90-100	90-100	85-100	70-80	35-40	15-20	.6-2.0	.19-.21	7.8-9.0	--	Moderate	High	Low				
Fraddle	0-22	scl	SC	A-6	0	90-100	90-100	70-85	35-50	30-40	11-15	.6-2.0	.14-.16	6.6-7.8	--	Moderate	High	Low	20-40	Rippable	B	Low
	22-33	sl	SM-SC, SC	A-2	0	90-100	90-100	50-70	20-30	20-40	5-15	2.0-6.0	.11-.13	7.4-8.4	2.0-4.0	Low	High	Low				
	33	wb	--	--	--	--	--	--	--	--	--	--										
Glenderson	0-60	sr-sl-l	SM-SC, CL	A-4	0	95-100	90-100	60-90	35-70	15-25	5-10	.6-2.0	.06-.08	7.4->9.0	4.0-8.0	Low	High	Moderate	>60	--	B	Low
Glendive	0-60	sr-sl-l	SM, CL	A-4	0	95-100	90-100	60-90	35-70	15-25	NP-10	2.0-6.0	.13-.15	7.4-9.0	--	Low	High	Low	>60	--	B	Low
Glendive, saline	0-60	sr-sl-l	SM, CL	A-4	0	95-100	90-100	60-90	35-70	15-25	NP-10	.2-.6	.06-.07	7.4-9.0	8.0-16.0	Low	High	High	>60	--	B	Moderate
Hatermus	0-18	cl, l	CL	A-6	0	90-100	90-100	85-100	65-80	25-35	11-15	.6-2.0	.08-.09	8.5->9.0	2.0-4.0	Moderate	High	High	10-20	Rippable	D	Low
	18	wb	--	--	--	--	--	--	--	--	--	--										
Haterton	0-18	l	ML-CL, CL	A-4, A-6	0	80-95	75-90	65-85	50-70	20-35	5-10	.6-2.0	.16-.18	7.8-9.0	2.0-4.0	Low	High	Moderate	10-20	Rippable	D	Low
	18+	wb	--	--	--	--	--	--	--	--	--											
Havre	0-60	sr-l-cl	CL	A-6	0	100	90-100	70-100	60-80	25-35	11-15	.6-2.0	.16-.18	7.4-9.0	2.0-4.0	Moderate	High	Low	>60	--	B	Low
Havre, saline	0-60	sr-l-cl	CL	A-6	0	100	90-100	65-100	0-80	25-35	11-15	.6-2.0	.08-.09	7.4-9.0	8.0-16.0	Moderate	High	Moderate	>60	--	B	Low
Huguston	0-14	sl	SM, SM-SC	A-1, A-2	0	70-80	60-75	35-50	20-30	10-15	NP-5	2.0-6.0	.11-.13	7.4-9.0	2.0-4.0	Low	High	Low	10-20	Rippable	D	Low
	14+	wb																				
Koonich	0-23	sl	SM-SC, SC	A-2	0	85-95	80-90	50-65	25-35	15-20	5-10	2.0-6.0	.11-.13	6.6-7.3	2.0-4.0	Low	High	Low	>60	--	A	Low
	23-60	s	SM, SM-SC	A-2	0	85-95	80-90	50-70	15-25	10-15	NP-5	6.0-20.0	.05-.07	6.6-7.3	2.0-4.0	Low	High	Low				
Laney	0-36	l	CL	A-6	0	90-100	90-100	90-100	70-80	25-35	15-25	.2-.6	.08-.09	8.5->9.0	4.0-8.0	Moderate	High	Moderate	>60	--	C	Moderate
	36-60	cl	CL	A-6	.0	90-100	90-100	90-100	70-80	25-35	20-30	.2-.6	.09-.10	>9.0	4.0-8.0	Moderate	High	Moderate				
Littsan	0-24	sl	SM, SM-SC	A-2	0	100	100	80-90	25-35	15-25	NP-5	2.0-6.0	.11-.13	6.6-7.8	2.0-4.0	Low	High	Low	20-40	Rippable	B	Low
	24+	variable	--	--	--	--	--	--	--	--	--											
Milren	0-16	c	CL	A-6	0	100	100	80-90	50-60	25-35	15-25	.2-.6	.14-.16	7.4-8.4	2.0-4.0	High	High	Low	>60	--	C	Low
	16-60	scl	SC	A-6	0	100	100	60-70	35-50	20-30	10-20	.2-.6	.07-.09	7.9->9.0	2.0-4.0	Moderate	High	Moderate				
Natrargids	10-30	sic	CL, CH	A-6, A-7	C	90-100	90-100	85-95	60-80	25-55	20-40	.06-.2	.07-.08	8.5->9.0	4.0-8.0	High	High	Moderate	20-40	Rippable	D	Low
	30+	variable	--	--	--	--	--	--	--	--	--											
Onason	0-11	gr-sl	SM, SM-SC	A-2	0-5	70-80	60-70	35-50	15-30	10-15	NP-5	6.0-20.0	.08-.10	6.6-7.3	<2.0	Low	High	Low	10-20	Rippable	C	Low
	11+	wb																				
Ouard	0-16	scl	SC	A-2, A-6	0-5	95-100	90-100	60-70	30-40	20-30	10-15	.6-2.0	.14-.16	6.6-9.0	2.0-4.0	Moderate	High	Moderate	10-20	Rippable	D	Low
	16+	wb																				
Rallod	0-12	sc	CL	A-6, A-7	0	95-100	95-100	70-80	60-70	35-45	20-30	.06-.2	.07-.08	7.4->9.0	4.0-8.0	High	High	Moderate	10-20	Rippable	D	Low
	12+	wb																				
Relsob	0-24	scl	SC, SM-SC	A-2	0	85-100	80-95	60-80	25-35	15-25	5-10	.6-2.0	.14-.16	6.6-7.3	<2.0	Low	High	Low	>60	--	B	Low
	24-60	gr-s	SP-SM	A-2	0	50-60	40-50	20-35	5-10	0-5	NP	6.0-20.0	.04-.06	6.6-7.3	<2.0	Low	High	Low				
Ryark	0-18	sl	SC, SM-SC	A-2	0	85-100	80-100	50-70	20-35	15-25	5-10	2.0-6.0	.11-.13	6.6-7.3	<2.0	Low	High	Low	>60	--	A	Low
	18-60	grf-s	SP-SM	A-1	C	60-75	55-70	30-50	5-10	0	NP	6.0-20.0	.04-.06	6.6-7.3	<2.0	Low	High	Low				
Salorthids	Too variable to estimate.											.06-.2	.08-.09	8.5-9.0	4.0->16.0	High	High	High	20-40	Rippable	C	Low
Tigon	0-15	scl	SC, SM-SC	A-2, A-6	0-5	75-90	70-85	55-70	24-45	20-30	5-15	.6-2.0	.14-.16	6.6-7.3	<2.0	Moderate	High	Low	10-20	Rippable	C	Low
	15+	wb	--	--	--	--	--	--	--	--	--											
Tresano	0-60	scl	SC	A-2, A-6	0-5	80-100	75-90	60-70	25-50	20-30	10-20	.6-2.0	.14-.16	7.4-9.0	2.0-4.0	Moderate	High	Low	>60	--	B	Moderate
Vible	0-16	sl	SM, SM-SC, SC	A-2	0-5	90-100	80-90	40-50	20-30	15-20	NP-10	2.0-6.0	.11-.13	6.6-7.3	<2.0	Low	High	Low	>60	--	A	Low
	16-60	cos	SP-SM	A-1	0-5	90-100	75-90	30-40	5-10	0	NP	6.0-20.0	.04-.06	6.6-7.8	<2.0	Low	High	Low				
Youjay	0-14	cl	CL	A-6	C-5	95-100	95-100	85-95	55-65	30-40	15-25	.2-.6	.09-.11	7.4->9.0	2.0-4.0	High	High	Moderate	10-20	Rippable	D	Low
	14+	wb	--	--	--	--	--	--	--	--	--											

*c clay
scl sandy clay loam
wb weathered bedrock

sl sandy loam
lfs loamy fine sand
fs fine sand

fsl fine sandy loam
cl clay loam
ls loamy sand

sil silt loam
sr stratified
l loam

s sand
sic silty clay
gr gravelly

sc sandy clay
grf fine gravelly
cos coarse sand

POTENTIAL SLIDE HAZARD

The potential of any soil to slide is affected by the presence or absence of moisture, steepness of slope, soil texture, and properties of the bedrock that influence lubrication when wet.

The areas in the 7 to 9 inch precipitation zone that have a potential slide hazard are made up primarily by mapping unit 357. The soils formed on slopes of 10 to 30 percent; and, if the underlying shales become lubricated, minor slides might occur.

The areas in the 10 to 14 inch precipitation zone that are subject to sliding are made up of mapping units 253 and 261. Part of unit 253 is underlain by alkaline shale; and, if the fine textured soils and shale become lubricated, a slide hazard exists on the steeper slopes. There is evidence that some areas of unit 253 are snowpack areas. The part of unit 261 occupied by the Coalmont soils may be subject to sliding under above normal moisture conditions.

Most of the soils in the Blue Rim Area have a low slide hazard as they occur on slopes that are not conducive to sliding or have soil texture that resists slippage or do not receive enough moisture for lubrication. A potential for sliding exists along the edges of the alluvial fans that join the New Fork River if large quantities of irrigation water are applied on the alluvial fans.

USE OF SOILS FOR RECREATIONAL DEVELOPMENT

Knowledge of soils is necessary in planning, developing, and maintaining areas used for recreation. In the individual soil survey interpretations sheets the soils of the Blue Rim Area are rated according to limitations that affect their suitability for camp areas, playgrounds, picnic areas, and paths and trails.

The soils are rated as having slight, moderate, or severe limitations for the specified uses. For all of these ratings it is assumed that a good cover of vegetation can be established and maintained. A limitation of slight means that soil properties are generally favorable and limitations are so minor that they easily can be overcome. A moderate limitation can be overcome or modified by planning, by design, or by special maintenance. A severe limitation means that costly soil reclamation, special design, intense maintenance, or a combination of these is required.

Camp areas are used intensively for tents and small camp trailers and the accompanying activities of outdoor living. Little preparation of the site is required other than shaping and leveling for tent and parking areas. Camp areas are subject to heavy foot traffic and limited vehicular traffic. The best soils have mild slopes, good drainage, a surface free of rocks and coarse fragments, freedom from flooding during periods of heavy use, and a surface that is firm after rains but not dusty when dry.

Picnic areas are attractive natural or landscaped tracts used primarily for preparing meals and eating outdoors. These areas are subject to heavy foot traffic. Most of the vehicular traffic, however, is confined to access roads. The best soils are firm when wet but not dusty when dry, are free of flooding during the

season of use, do not have slopes or stoniness that greatly increases cost of leveling sites or of building access roads.

Playgrounds are areas used intensively for baseball, football, badminton, and similar organized games. Soils suitable for this use need to withstand intensive foot traffic. The best soils have a nearly level surface free of coarse fragments and rock outcrops, good drainage, freedom from flooding during periods of heavy use, and a surface that is firm after rains but not dusty when dry. If grading and leveling are required, depth to rock is important.

Paths and trails are used for local and cross country travel by foot or horseback. Design and layout should require little or no cutting and filling. The best soils are at least moderately well drained, are firm when wet but not dusty when dry, are flooded not more than once during the season of use, have slopes of less than 15 percent, and have few or no rocks or stones on the surface.

SOIL SURVEY INTERPRETATIONS

This section contains the Soil Survey Interpretation sheets for each soil series mapped in the Blue Rim Area. It also contains individual interpretive sheets for a few soil phases that differ significantly from their respective series. Also included is a list of key phrases that are used to explain the limitation and suitability ratings given in the interpretive sheets.

LIST OF KEY PHRASES

Key Phrases	Explanation
Area Reclaim	Borrow areas hard to reclaim.
Cemented Pan	Cemented pan too close to surface.
Complex Slope	Slopes short and irregular.
Compressible	Decrease in soil volume excessive under load.
Compaction Characteristic	Compaction characteristic of materials for compacted embankments
Corrosive	Soils corrode uncoated steel pipe.
Cutbanks Cave	Walls of cuts not stable.
Deep to Water	Deep to permanent water table during dry season.
Depth to Rock	Bedrock too close to surface.
Droughty	Soils cannot hold enough water for plants during dry periods.
Dusty	Soil particles detach easily and cause dust.
Erodes Easily	Water erodes soil easily.
Excess Alkali	Exchangeable sodium affects soil properties and restricts growth of plants.

Key Phrases	Explanation
Excess Humus	Contains too much organic matter.
Excess Lime	Carbonates restrict plant growth.
Excess Salt	Soluble salts restrict plant growth.
Fast Intake	Water infiltrates rapidly.
Favorable	Features of soil favorable.
Floods	Soil floods by stream overflow, runoff, or high tides.
Frost Action	Freezing may damage structures.
Hard to Pack	Difficult to compact.
Large Stones	Rock fragments 10 inches or more across.
Low Strength	Not enough strength to adequately support the load.
No Water	Too deep to ground water.
Not Needed	Practice not applicable.
Percs Rapidly	Water moves through soil too fast.
Piping	Water may form tunnels or pipelike cavities
Poor Outlets	Difficult or expensive to install outlets for drainage.
Rock Outcrops	Outcrops of fixed rock.
Rooting Depth	Soil is thin over layer that restricts root growth.
Shrink-Swell	Soil expands significantly on wetting and shrinks on drying
Slope	Slope is too great.
Slow Intake	Water infiltration restricted.
Slow Refill	Ponds fill slowly because of restricted soil permeability.
Small Stones	Contains many rock fragments less than 10 inches across.
Thin Layer	Inadequate thickness of suitable soil.
Too Clayey	Soil slippery and sticky when wet and slow to dry.
Too Sandy	Soft, loose soil material makes vehicular and foot traffic difficult.
Unstable Fill	Banks of fills likely to cave or slough.
Wet	Soil wet during period of use.

CLASSIFICATION OF SOILS

Soils are classified in order that we can more easily remember their significant characteristics. Classification enables us to assemble knowledge about the soils, to see their relationship to one another and to the whole environment, and to develop principles that help us to understand their behavior and their response to manipulation. First, through classification, and then through use of soil maps, we can apply our knowledge of soils to specific fields and other tracts of land.

The narrow categories of classification such as those used in detailed soil surveys allow us to organize and apply knowledge about soils in managing farms, fields, and woodlands; in developing rural areas; in engineering work; and in many other ways. Soils are placed in broad classes to facilitate study and comparison in large areas such as countries and continents.

The system of soil classification currently used was adopted by the National Cooperative Soil Survey in 1965. Because this system is under continual study, readers interested in developments of the current system should search the latest literature available.

The current system of classification has six categories. Beginning with broadest, these categories are order, suborder, great group, subgroup, family, and series. In this system the criteria used as a basis for classification are soil properties that are observable and measurable. The properties are chosen, however, in order that the soils of similar kinds of morphology are grouped. In Table 6 the soil series of the Blue Rim Area are placed in four categories of the current system. Classes of the current system are briefly defined in the following paragraphs:

Order - Ten soil orders are recognized. The properties used to differentiate among soil orders are those that tend to give broad climatic groupings of soils. The two exceptions to this are the Entisols and Histosols which occur in many different climates. Each order is named with a word of three or four syllables ending in sol (Ent-i-sol).

Suborder - Each order is subdivided into suborders that are based primarily on those soil characteristics that seem to produce classes with the greatest genetic similarity. The suborders narrow the broad climatic range permitted in the orders. The soil properties used to separate suborders are mainly those that reflect either the presence or absence of waterlogging or soil differences resulting from the climate or vegetation. The names of suborders have two syllables. The last syllable indicates the order. An example is Argids (Arg is an abbreviation for the word "argillic" meaning silicate clay that has been accumulated in a soil horizon after being leached out of an overlying layer; and "id" from Aridisols, meaning mineral soils low in organic matter and formed under low rainfall.).

Great Group - Soil suborders are separated into great groups on the basis of uniformity in the kinds and sequence of major soil horizons and features. The horizons used to make separations are those in which clay, iron, or humus have accumulated; those that have pans that interfere with growth of roots, movement of water, or both; and thick, dark colored surface horizons. The features used

are the self-mulching properties of clay, soil temperature, major differences in chemical composition (mainly calcium, magnesium, sodium, and potassium), dark red and dark brown colors associated with basic rocks, and the like. The names of great groups have three or four syllables and are made by adding a prefix to the name of the suborder. An example is Haplargids (Hapl meaning a simple set of horizons and argids. Arg is an abbreviation for the word "argillic" meaning silicate clay that has been accumulated in a soil horizon after being leached out of an overlying layer; and "id" from Aridisols, meaning mineral soils low in organic matter and formed under low rainfall.).

Subgroup - Great groups are subdivided into subgroups, one representing the central (typic) segment of the group, and others called intergrades that have properties of the group and also one or more properties of another great group, suborder, or order. Subgroups may also be made in those instances where soil properties intergrade outside of the range of any other great group, suborder, or order. The names of subgroups are derived by placing one or more adjectives before the name of the great group. An example is Typic Haplargids (a typical Haplargid).

Family - Soil families are separated within a subgroup primarily on the basis of properties important to the growth of plants or on the behavior of soils when used for engineering. Among the properties considered are texture, mineralogy, reactions, soil temperature, permeability, thickness of horizons, and consistence. A family name consists of a series of adjectives preceding the subgroup name. The adjectives are the class names for texture, mineralogy, and so on that are used as family differentiae. See Table 6. An example is the fine-loamy, mixed, frigid family of Typic Haplargids.

TABLE 5 - INTERPRETATIONS OF ENGINEERING PROPERTIES OF SOILS

Soil Series	Degree and Kind of Limitation for:		Suitability as Source of:				Soil Features Affecting:			
	Shallow Excavations	Local Roads and Streets	Roadfill	Sand	Gravel	Topsoil	Pond Reservoir Areas	Embankments, Dikes, and Levees	Excavated Ponds Aquifer Fed	Drainage
Abston	6-8%: Moderate - Depth to rock 8-15%: Moderate - Slope, depth to rock	Severe - Shrink-swell, low strength	Poor - Thin layer, low strength	Unsuited	Unsuited	Poor - Excess alkali	Depth to rock, slope	Low strength, thin layer	No water	Percs slowly, excess alkali, depth to rock
Bluerim	3-8%: Moderate - Depth to rock 8-15%: Moderate - Slope, depth to rock 15+%: Severe - slope	3-8%: Moderate - Low strength 8-15%: Moderate - Slope, low strength 15+%: Severe - slope	Poor - Thin layer	Unsuited	Unsuited	3-8%: Fair - Too clayey 8-15%: Fair - Slope, too clayey 15+%: Poor - slope	Depth to rock, slope	Percs rapidly, low strength, thin layer	No water	Depth to rock
Bodorumpe	Severe - Cutbanks cave	3-8%: Slight 8-15%: Moderate - Slope	Poor - Thin layer	Poor - excess fines	Unsuited	Poor - too sandy	Percs rapidly, depth to rock, slope	Percs rapidly, thin layer, piping	No water	Depth to rock, cutbanks cave
Coalmont	3-8%: Moderate - Too clayey, depth to rock 8-15%: Moderate - Slope, too clayey, depth to rock	Severe - Low strength	Poor - Thin layer, low strength	Unsuited	Unsuited	3-8%: Fair - Too clayey 8-15%: Fair - Slope, too clayey	Slope, depth to rock	Low strength, thin layer	No water	Depth to rock, percs slowly
Cotha	Severe - Depth to rock	3-8%: Slight 8+%: Moderate - Slope	Poor - Thin layer	Poor	Unsuited	3-8%: Good 8-15%: Fair - slope	Percs rapidly, slope, depth to rock	Percs rapidly, piping	No water	Depth to rock
Cothran	Severe - Cutbanks cave	Slight	Good	Fair to Poor	Unsuited	Poor - Too sandy	Percs rapidly	Percs rapidly, piping	No water	Cutbanks cave
DeBone	6-8%: Slight 8-10%: Moderate - slope	6-8%: Moderate - Shrink-swell, low strength 8-10%: Moderate - Slope, shrink-swell, low strength	Fair - Shrink-swell, low strength	Unsuited	Unsuited	Poor - excess alkali	Slope	Unstable fill	No water	Percs slowly, excess alkali
Fluvents	Severe - Floods, wet	Severe - Floods, wet	Poor - Wet	Unsuited	Unsuited	Poor - Wet	Percs rapidly	Unstable fill	Favorable	Poor outlets, floods, wet
Forelle	Moderate - Too clayey	Moderate - Shrink-swell, low strength	Fair to poor - low strength	Unsuited	Unsuited	Fair - Too clayey	Favorable .	Low strength	No water	Percs slowly
Fraddle	3-8%: Moderate - Depth to rock 8-15%: Moderate - slope, depth to rock 15+%: Severe - Slope	3-8%: Moderate - Shrink-swell 8-15%: Moderate - Slope, Shrink-swell 15+%: Severe - Slope	Poor - Thin layer	Unsuited	Unsuited	3-8%: Fair - Too clayey 8-15%: Fair - Slope, too clayey 15+%: Poor - Slope	Depth to rock, slope, percs rapidly	Low strength, percs rapidly	No water	Depth to rock
Glenderson	Slight	Moderate - Low strength	Fair - Low strength	Unsuited	Unsuited	Poor - Excess alkali	Percs rapidly	Unstable fill, percs rapidly	No water	Excess alkali
Glendive	Severe - Floods	Severe - Floods	Fair - Low strength	Unsuited	Unsuited	Good	Percs rapidly	Percs rapidly, low strength	Deep to water	Floods
Glendive, saline	Severe - Wet, floods	Severe - Floods	Fair - Area reclaim, low strength	Unsuited	Unsuited	Poor - Excess salt	Percs rapidly	Unstable fill	Favorable	Floods, cutbanks cave, excess salt
Hatermus	10-15%: Severe - Depth to rock 15+%: Severe - Slope, depth to rock	10-15%: Moderate - Slope 15+%: Severe - Slope	Poor - Thin layer	Unsuited	Unsuited	Poor - Thin layer, excess alkali	Slope, depth to rock	Thin layer, low strength	No water	Depth to rock, Excess alkali
Haterton	10-15%: Severe - Depth to rock 15+%: Severe - Slope, depth to rock	10-15%: Moderate - Slope 15+%: Severe - Slope	Poor - Thin layer	Unsuited	Unsuited	Poor - Thin layer	Depth to rock, slope	Thin layer, low strength	No water	Depth to rock
Havre	Severe - Floods	Severe - Floods	Fair - Shrink-swell, low strength	Unsuited	Unsuited	Good	Favorable	Low strength, shrink-swell	Deep to water	Floods
Havre, saline	Severe - Floods, wet	Severe - Floods	Fair - Area reclaim, shrink-swell, low strength	Unsuited	Unsuited	Poor - Excess salts	Favorable	Unstable fill	Favorable	Floods, excess salt
Huguston	10-15%: Severe - Depth to rock 15+%: Severe - Slope, depth to rock	10-15%: Moderate - Slope, depth to rock 15+%: Severe - Slope	Poor - Thin layer	Poor	Unsuited	10-15%: Poor - Thin layer 15+%: Poor - Slope, thin layer	Depth to rock, slope, percs rapidly	Thin layer, percs rapidly, piring	No water	Depth to rock
Koonich	Moderate - Floods	Moderate - Floods	Good	Unsuited	Unsuited	Good	Percs rapidly	Percs rapidly	Deep to water	Floods
Laney	Moderate - Too clayey	Severe - Low strength	Poor - Area reclaim, low strength	Unsuited	Unsuited	Poor - Excess alkali	Favorable	Low strength, unstable fill	No water	Excess alkali
Littsan	3-8%: Moderate - Depth to rock 8+%: Moderate - Slope, depth to rock	3-8%: Slight 8+%: Moderate - slope	Poor - Thin layer	Poor	Unsuited	Good	Slope, percs rapidly	Percs rapidly	No water	Depth to rock
Milren	3-8%: Moderate - Too clayey 8+%: Moderate - Slope, too clayey	Severe - Shrink-swell, low strength	Poor - Shrink-swell, low strength	Unsuited	Unsuited	Poor - Too clayey, excess alkali	Favorable	Unstable fill	No water	Excess alkali, percs slowly
Natrargids	Severe - Too clayey	Severe - shrink-swell, low strength	Poor - Shrink-swell, thin layer, low strength	Unsuited	Unsuited	Poor - Excess alkali, too clayey	Slope, depth to rock	Unstable fill	No water	Depth to rock, excess alkali, percs slowly
Onasco	10-15%: Severe - Depth to rock 15+%: Severe - Slope, depth to rock	10-15%: Moderate - Depth to rock 15+%: Severe - Slope	Poor - Thin layer	Unsuited	Unsuited	10-15%: Poor - Small stones, thin layer 15+%: Poor - Slope, small stones, thin layer	Depth to rock, percs rapidly, slope	Thin layer, percs rapidly	No water	Depth to rock
Cuard	Severe - Depth to rock	Severe - Depth to rock	Poor - Thin layer	Unsuited	Unsuited	Poor - Thin layer	Depth to rock, slope	Thin layer, percs rapidly	No water	Depth to rock, excess alkali
Rallod	10-15%: Severe - Depth to rock 15+%: Severe - Slope, depth to rock	10-15%: Severe - Depth to rock, shrink-swell, low strength 15+%: Severe - Slope, depth to rock, shrink-swell, low strength	0-25%: Poor - Shrink-swell, thin layer 25+%: Poor - Slope, shrink-swell, thin layer	Unsuited	Unsuited	10-15%: Poor - Excess alkali, thin layer 15+%: Poor - Slope, excess alkali, thin layer	Depth to rock, slope	Thin layer, unstable fill	No water	Depth to rock, excess alkali, percs slowly
Relsob	3-8%: Moderate - Small stones 8+%: Moderate - Slope, small stones	3-8%: Slight 8+%: Fair - Slope	Fair - Low strength	Fair	Fair	Fair - Too clayey	Percs rapidly	Percs rapidly	No water	Favorable
Ryark	3-8%: Moderate - Small stones 8+%: Moderate - Slope, small stones	3-8%: Slight 8+%: Moderate - Slope	Good	Fair	Poor	3-8%: Good 8+%: Fair - Slope	Percs rapidly	Percs rapidly, hard to pack	No water	Favorable
Salorthids	Severe - Too clayey, Shrink-swell	Severe - Low strength, shrink-swell	Poor - Area reclaim, low strength, shrink-swell	Unsuited	Unsuited	Poor - Excess salts	Favorable	Low strength, unstable fill	No water	Excess salts
Tigon	6-15%: Severe - Depth to rock 15+%: Severe - Slope, depth to rock	6-15%: Moderate - Depth to rock 15+%: Severe - Slope	Poor - Thin layer	Unsuited	Unsuited	Poor - Thin layer	Depth to rock, slope	Thin layer	No water	Depth to rock
Tresano	6-8%: Slight 8+%: Moderate - slope	6-8%: Moderate - Shrink-swell, low strength 8+%: Moderate - slope, low strength, shrink-swell	Poor - Low strength, shrink-swell	Unsuited	Unsuited	6-8%: Fair - Too clayey 8+%: Fair - Slope, too clayey	Slope	Low strength	No water	Percs slowly
Vible	Slight	Slight	Good	Fair	Fair	Fair - Thin layer	Percs rapidly	Percs rapidly	No water	Favorable
Youjay	3-15%: Severe - Depth to rock 15+%: Severe - Slope, depth to rock	3-15%: Severe - Depth to rock, low strength, shrink-swell 15+%: Severe - Slope, depth to rock, shrink-swell, low strength	3-25%: Poor - Thin layer 25+%: Poor - Slope, thin layer	Unsuited	Unsuited	3-15%: Poor - Thin layer, excess alkali, too clayey 15+%: Poor - Slope, thin layer, too clayey, excess alkali	Slope, depth to rock	Thin layer, low strength	No water	Depth to rock, excess alkali

TABLE 6

SOIL SERIES CLASSIFIED ACCORDING TO THE CURRENT SYSTEM OF CLASSIFICATION

Series	Family	Subgroup	Order
Abston	Fine, montmorillonitic	Borollic Natrargids	Aridisols
Bluerim	Fine-loamy, mixed	Borollic Haplargids	Aridisols
Bodorumpe	Mixed, frigid	Typic Torripsamments	Entisols
Coalmont	Fine, montmorillonitic	Borollic Paleargids	Aridisols
Cotha	Coarse-loamy, mixed	Borollic Haplargids	Aridisols
Cothran	Mixed, frigid	Ustic Torripsamments	Entisols
DeBone	Fine, montmorillonitic, frigid	Typic Natrargids	Aridisols
Forelle	Fine-loamy, mixed	Borollic Haplargids	Aridisols
Fraddle	Fine-loamy, mixed, frigid	Typic Haplargids	Aridisols
Glenderson	Coarse-loamy, mixed (calcareous), frigid	Typic Torrifluvents	Entisols
Glendive	Coarse-loamy, mixed (calcareous), frigid	Ustic Torrifluvents	Entisols
Hatermus	Loamy, mixed (calcareous), frigid, shallow	Typic Torriorthents	Entisols
Haterton	Loamy, mixed (calcareous), frigid, shallow	Typic Torriorthents	Entisols
Havre	Fine-loamy, mixed (calcareous), frigid	Ustic Torrifluvents	Entisols
Huguston	Loamy, mixed (calcareous), frigid, shallow	Typic Torriorthents	Entisols
Koonich	Sandy, mixed, frigid	Typic Torriorthents	Entisols
Laney	Fine-loamy, mixed (calcareous), frigid	Typic Torrifluvents	Entisols
Littsan	Coarse-loamy, mixed, frigid	Typic Haplargids	Aridisols
Milren	Fine, montmorillonitic	Borollic Paleargids	Aridisols
Onason	Loamy, mixed, nonacid, frigid, shallow	Ustic Torriorthents	Entisols
Ouard	Loamy, mixed, frigid, shallow	Typic Haplargids	Aridisols
Rallod	Clayey, montmorillonitic, shallow	Borollic Natrargids	Aridisols
Relsob	Fine-loamy over sandy or sandy-skeletal, mixed	Borollic Haplargids	Aridisols
Ryark	Coarse-loamy, mixed	Borollic Haplargids	Aridisols
Tigon	Loamy, mixed, shallow	Borollic Haplargids	Aridisols
Tresano	Fine-loamy, mixed, frigid	Typic Haplargids	Aridisols
Vible	Sandy, mixed	Ustic Torriorthents	Entisols
Youjay	Clayey, montmorillonitic, frigid, shallow	Typic Natrargids	Aridisols

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GLOSSARY

Alkali soil - Generally, a highly alkaline soil. Specifically, an alkali soil has 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 the growth of most crop plants is low from this cause.

Alluvial fan - A sloping, fan-shaped mass of sediment deposited by a stream where it emerges from an upland onto a plain.

Alluvium - Soil material, such as sand, silt, or clay, that has been deposited on land by streams.

Available water capacity - The capacity of a soil to hold water in a form available to plants. Amount of moisture held in soil between field capacity, or about one-third atmosphere of tension, and the wilting coefficient, or about 15 atmospheres of tension.

Calcareous soil - Soil containing sufficient calcium carbonate (often with magnesium carbonate) to effervesce visibly when treated with cold 0.1 normal hydrochloric acid.

Channery - Fragments of thin, flat sandstone, limestone, schist, or hard shale up to 6 inches along the longer axis. A single piece is a fragment.

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.

Coarse fragments - Rock or mineral particles greater than 2.0 millimeters in diameter.

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 and brittle; little affected by moistening.

Control section - (As used in the Soil Classification System of the National Cooperative Soil Survey in the United States) - Arbitrary depths of soil material within which certain diagnostic horizons, features, and other characteristics are used as differentiae in the classification of soils. The thickness

is specific for each characteristic being considered but may be different for different characteristics.

Depth, effective soil - The depth of soil material that plant roots can penetrate readily to obtain water and plant nutrients. It is the depth to a layer that differs sufficiently from the overlying material in physical or chemical properties to prevent or seriously retard the growth of roots.

Drainage, soil - As a natural condition of the soil, soil drainage refers to the frequency and duration of periods when the soil is free of saturation; for example, in well-drained soils the water is removed readily but not rapidly; in poorly drained soils the root zone is waterlogged for long periods unless artificially drained, and the roots of ordinary crop plants cannot get enough oxygen; in excessively drained soils the water is removed so completely that most crop plants suffer from lack of water. Strictly speaking, excessively drained soils are a result of excessive runoff due to steep slopes or low available water-holding capacity due to small amounts of silt and clay in the soil material.

Erosion - The wearing away of the land surface by wind (sandblast), running water, and other geological agents.

Horizon, soil - A layer of soil, approximately parallel to the surface, that has distinct characteristics produced by soil-forming processes. These are the major horizons:

O horizon - The layer of organic matter on the surface of a mineral soil. This layer consists of decaying plant residues.

A horizon - The mineral horizon at the surface or just below an O horizon. This horizon is the one in which living organisms are most active and, therefore, is marked by the accumulation of humus. The horizon may have lost one or more of soluble salts, clay, and sesquioxides (iron and aluminum oxides).

B horizon - The mineral horizon below an A horizon. The B horizon is in part a layer of change from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics caused (1) by accumulation of clay, sesquioxides, humus, or some combination of these; (2) by prismatic or blocky structure; (3) by redder or stronger colors than the A horizon; or (4) by some combination of these. Combined A and B horizons are usually called the solum, or true soil. If a soil lacks a B horizon, the A horizon alone is the solum.

C horizon - The weathered rock material immediately beneath the solum. In most soils this material is presumed to be like that from which the overlying horizons were formed. If the material is known to be different from that in the solum, a Roman numeral precedes the letter C.

R layer - Consolidated rock beneath the soil. The rock usually underlies a C horizon but may be immediately beneath an A or B horizon.

Landscape - All of the natural features that distinguish one part of the earth's surface from another part, usually that portion of land or territory which the eye can comprehend in a single view, including all of its natural characteristics. In many places in this report "landscapes" are used to identify all of the features included within the delineated areas of complexes, associations, and undifferentiated groups.

Mottled - Irregularly marked with spots of different colors that vary in number and size. Mottling in soils usually indicates poor aeration and lack of 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 these: Fine, less than 5 millimeters (about 0.2 inch) in diameter along the greatest dimension; medium, ranging from 5 millimeters to 15 millimeters (about 0.2 to 0.6 inch) in diameter along the greatest dimension; and coarse, more than 15 millimeters (about 0.6 inch) in diameter along the greatest dimension.

Parent material (soil) - The horizon of weathered rock or partly weathered soil material from which soil has formed; horizon C in the soil profile.

Permeability, soil - The quality of a soil horizon that enables water or air to move through it. Terms used to describe permeability are as follows: Very slow, slow, moderately slow, moderate, moderately rapid, rapid, and very rapid.

Planed slopes - Landscapes or land surfaces that have been shaped by landforming processes, such as ancient streams, resulting in a plane.

Planes - Land surfaces that are nearly level or that slope uniformly with a minimum of depressions or elevations. If two points on the surface are connected with a straight line, the line would parallel the surface.

Reaction, soil - The degree of acidity or alkalinity of a soil expressed in pH values. A soil that tests to pH 7.0 is precisely neutral in reaction because it is neither acid nor alkaline. An acid, or "sour," soil is one that gives an acid reaction; an alkaline soil is one that is alkaline in reaction. In words, the degrees of acidity or alkalinity are expressed thus:

	pH		pH
Extremely acid	Below 4.5	Neutral	6.6 to 7.3
Very strongly acid	4.5 to 5.0	Mildly alkaline	7.4 to 7.8
Strongly acid	5.1 to 5.5	Moderately alkaline	7.9 to 8.4
Medium acid	5.6 to 6.0	Strongly alkaline	8.5 to 9.0
Slightly acid	6.1 to 6.5	Very strongly alkaline	9.1 and higher

Residuum - Unconsolidated, partly weathered mineral material that accumulates over disintegrating bedrock.

Ridge - A relatively narrow elevation which is prominent on account of the steep angle at which it rises.

Saline soil - A soil that contains soluble salts in amounts that impair growth of plants but that does not contain excess exchangeable sodium.

Sand - Individual rock or mineral fragments in soils having diameters ranging from 0.05 to 2.0 millimeters. Most sand grains consist of quartz, but they may be of any mineral composition. The textural class name of any soil that contains 85 percent or more sand and not more than 10 percent clay.

Secondary carbonates - The accumulation of calcium carbonate into specks, threads, soft concretions, etc. within a soil horizon. The horizon must have more carbonates than the parent material is presumed to have had.

Silt - Individual mineral particles in a soil that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). Soil of the silt textural class is 80 percent or more silt and less than 12 percent clay.

Slope classes -

Slope Range (%)	Simple Slopes	Complex Slopes
0-3	nearly level	nearly level
3-6	gently sloping	undulating
6-10	sloping	rolling
10-20	moderately steep	hilly
20-40	steep	steep
over 40	very steep	very steep

Soil profile - A vertical section of the soil from the surface through all its horizons, including C horizons. See horizon, soil.

Solum - The upper part of a soil profile, above the parent material, in which the processes of soil formation are active. The solum in mature soil includes the A and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the underlying material. The living roots and other plant and animal life characteristic of the soil are largely confined to the solum.

Structure, soil - The arrangement of primary soil particles into compound particles or clusters that are separated from adjoining aggregates and have properties unlike those of an equal mass of unaggregated primary particles. 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 (1) single grain (each grain by itself, as in dune sand) or (2) massive (the particles adhering together without any regular cleavage, as in many claypans and hardpans).

Subsoil - Technically, the B horizon; roughly, the part of the solum below plow depth.

Substratum - Technically, the part of the soil below the solum.

Surface layer - The uppermost layer of the soil.

Terrace (geological) - An old alluvial plain, ordinarily flat or undulating, bordering a river, lake, or the sea. Stream terraces are frequently called second bottoms, as contrasted to floodplains, and are seldom subject to overflow. Marine terraces were deposited by the sea and are generally wide.

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."

Underlying layer - That part of the soil below the surface layer if no "B" horizon is present.

Water table - The highest part of the soil or underlying rock material that is wholly saturated with water. In some places an upper, or perched, water table may be separated from a lower one by a dry zone.

Dashes under Range Site or Capability Classification Headings
indicate the Mapping Unit was not Placed in the Specific Grouping

Map Symbol	Mapping Unit	Described on Page	Range Site				Capability Classification
			7 to 9" P. Z.		10 to 14" P. Z.		Dryland Symbol
			Name	Page	Name	Page	
102	Shale rock land	47	--		--		VIIIs83
110	Natrargids	37	--		Dense Clay	58	VIIe71
112	Rock land-Natrargids complex	43					VIIe71
	Rock land part		Shale	64	--		
	Natrargids part		Dense Clay	62	--		
113	Salorthids-Natrargids complex	47	Saline Lowland	63	--		VIIe71
250	Glendive-Havre complex, saline	26					VIws11
	Glendive, saline part		--		Saline Subirr.	59	
	Havre, saline part		--		Saline Subirr.	59	
	Glendive part		--		Overflow	59	
	Havre part		--		Overflow	59	
251	Bluerim-Tigon association	9					
	Bluerim part		--		Loamy	58	VIe2
	Tigon part		--		Shallow Loamy	60	VIIe14
252	Tigon-Bluerim association	48					
	Tigon part		--		Shallow Loamy	60	VIIe14
	Bluerim part		--		Loamy	58	VIe2
253	Rallod-Onason-Rock outcrop complex, 10 to 30% slopes	41					VIIe14
	Rallod part		--		Shallow Clayey	60	
	Onason part		--		Shallow Sandy	61	
	Rock outcrop part		--		--		
254	Combined with 256	10					
256	Bluerim-Abston, and Milren soils, 3 to 15% slopes	10					
	Bluerim part		--		Loamy	58	VIe2
	Abston part		--		Clayey	57	VIIe71
	Milren part		--		Clayey	57	VIe1
257	Bluerim-Cotha association	9					
	Bluerim part		--		Loamy	58	VIe2
	Cotha part		--		Sandy	60	VIe5
258	Forelle-Havre assocation	20					VIc2
	Forelle part		--		Loamy	58	
	Havre part		--		Overflow	59	
259	Ryark-Relsob complex, 3 to 10% slopes	45					VIe5
	Ryark part		--		Sandy	60	
	Relsob part		--		Loamy	58	
260	Ryark-Cothran association	45					
	Ryark part		--		Sandy	60	VIe5
	Cothran part		--		Sands	59	VIe15
261	Coalmont-Bluerim complex, 3 to 15% slopes	13					VIe1
	Coalmont part		--		Clayey	57	
	Bluerim part		--		Loamy	58	
262	Cotha-Ryark complex, 3 to 15% slopes	15					VIe5
	Cotha part		--		Sandy	60	
	Ryark part		--		Sandy	60	
	Bluerim part		--		Loamy	58	
263	Vible sandy loam	52	--		Sandy	60	VIe5
264	Fluvents	18	--		--		--
351	Laney-Glenderson complex	33					VIIs71
	Laney part		Saline Upland	63	--		
	Glenderson part		Loamy	62	--		
352	Fraddle-Ouard complex	23					VIIe14
	Fraddle part		Loamy	62	--		
	Ouard part		Shallow Loamy	65	--		
	Youjay part		Shallow Clayey	64	--		
354	Fraddle-Littsan association	22					
	Fraddle part		Loamy	62	--		VIe2
	Littsan part		Sandy	64	--		VIe5
355	Combined with 365	35					
356	Koonich-Laney complex	32					VIe5
	Koonich part		Sandy	64	--		
	Laney part		Saline Upland	63	--		
357	Rock land-Huguston, and Youjay soils, 10 to 30% slopes	43					
	Rock land part		Shale	64	--		VIIs17
	Huguston part		Shallow Sandy	65	--		VIIe14
	Youjay part		Shallow Clayey	64	--		VIIe14
359	Rock land-Hatermus complex, 10 to 30% slopes	43					
	Rock land part		Shale	64	--		VIIs17
	Hatermus part		Shallow Loamy	65	--		VIIe14
	Youjay part		Shallow Clayey	64	--		VIIe14
360	DeBone-Tresano complex, 6 to 10% slopes	18					VIIe71
	DeBone part		Loamy	62	--		
	Tresano part		Loamy	62	--		
361	Fraddle-Haterton association	22					
	Fraddle part		Loamy	62	--		VIe2
	Haterton part		Shallow Loamy	65	--		VIIe14
	Hatermus part		Shallow Loamy	65	--		VIIe14
365	Littsan-Bodorumpe association	35					
	Littsan part		Sandy	64	--		VIe5
	Bodorumpe part		Sands	63	--		VIe15

CONVENTIONAL SIGNS

WORKS AND STRUCTURES

Highways and roads

Dual

Good motor

Poor motor

Trail

Buildings

School

Church

Mine and quarry

Gravel pit

Power line

Pipeline

Cemetery

Dams

Levee

Tanks

Well, oil or gas

Forest fire or lookout station

Windmill

SOIL SURVEY DATA

Soil boundary and symbol — 251

Gravel

Stoniness — Stony; Very stony

Rock outcrops

Chert fragments

Clay spot

Sand spot

Gumbo or scabby spot

Made land

Severely eroded spot

Blowout, wind erosion

Gully

Saline Spot +

Alkali Spot A

BOUNDARIES

National or state

County

Reservation

Land grant

Small park, cemetery, airport

Land survey division corners

Survey Area — where fenced; unfenced

DRAINAGE

Streams, double-line

Perennial

Intermittent

Streams, single-line

Perennial

Intermittent

Canals and ditches

Lakes and ponds

Perennial

Intermittent

Spring

Marsh or swamp

Wet spot

Alluvial fan

Drainage end

Wells, water — flowing

RELIEF

Escarpments

Bedrock

Other

Prominent peak

SCS-SOILS-5
REV. MAY 1972
FILE CODE SOILS-12

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

SOIL SURVEY INTERPRETATIONS

KEYING ONLY: RECORD NO. | CONTROL WORO 001, MLRA 011, STATE 011

MLRA(S) 34 | KIND OF UNIT SERIES | UNIT NAME ABSTON
STATE Wyoming | RECORD NO. | AUTHOR(S) JRS | DATE 1/73 | REVISED | UNIT MODIFIER

CLASSIFICATION AND BRIEF SOIL DESCRIPTION

CLASS 021: BOROLLIC NATRARGIDS, FINE MONTMORILLONITIC

OESCR 031: THE ABSTON SERIES ARE WELL DRAINED SOILS FORMED IN RESIDUUM FROM SHALE ON HILLSIDES. SLOPES ARE 6 TO 15 PERCENT. PRECIPITATION IS 10 TO 12 INCHES, AND MEAN ANNUAL AIR TEMPERATURE IS ABOUT 36°F. TYPICALLY, THE SURFACE LAYER IS YELLOWISH BROWN SANDY LOAM ABOUT 1 INCH THICK. THE SUBSURFACE LAYER IS LIGHT GRAY SANDY LOAM ABOUT 2 INCHES THICK. THE SUBSOIL IS BROWN TO GRAYISH BROWN CLAY TO SANDY CLAY LOAM ABOUT 14 INCHES. THE SUBSTRATUM IS BROWN TO LIGHT BROWNISH GRAY SANDY CLAY LOAM ABOUT 17 INCHES THICK AND IS UNDERLAIN BY SOFT ALKALINE SHALE AT A DEPTH OF 34 INCHES.

ESTIMATED SOIL PROPERTIES

	FOOTNOTE	DEPTH (IN.)	USOA TEXTURE	UNIFIED	AASHO	FRACT. >3 IN. (PCT)	PERCENT OF MATERIAL LESS THAN 3 IN. PASSING SIEVE 4	10	40	200	LIQUID LIMIT	PLASTICITY INDEX
PROP 041		0-10	C	CL	A-6, A-7	0	90-100	90-100	85-90	70-80	35-45	15-25
2		10-34	SCL	CL	A-6	0	90-100	90-100	60-80	35-50	30-40	11-15
3		34	WB	--	--	--	--	--	--	--	--	--
4												
5												
6												

	DEPTH (IN.)	PERMEABILITY (IN/HR)	AVAILABLE WATER CAPACITY (IN/IN)	SOIL REACTION (pH)	SALINITY (MMHOS/CM)	SHRINK-SWELL POTENTIAL	CORROSIVITY STEEL	CORROSIVITY CONCRETE	EROSION FACTORS K	EROSION FACTORS T	WIND EROD. GROUP
PROP 051		0.06-0.2	0.08-0.10	6.6-9.0	2.0-4.0	HIGH	HIGH	LOW	.32	3	3
2	SAME DEPTH AS ABOVE	0.06-0.2	0.06-0.08	8.5->9.0	4.0-8.0	MODERATE	HIGH	MODERATE	.28		
3											
4											
5											
6											

	FLOODING FREQUENCY	FLOODING DURATION	FLOODING MONTHS	HIGH WATER TABLE DEPTH (FT)	HIGH WATER TABLE KIND	HIGH WATER TABLE MONTHS	CEMENTED PAN DEPTH (IN)	CEMENTED PAN HARDNESS	BEDROCK DEPTH (IN)	BEDROCK HARDNESS	SUBSIDENCE INITIAL (IN)	SUBSIDENCE TOTAL (IN)	HYD GRP	POTENTIAL FROST ACTION
PROP 061	NONE			>6			--		20-40	RIPPABLE	--		D	LOW

SANITARY FACILITIES

	FOOTNOTES	
SEPTIC 071	SEPTIC TANK ABSORPTION FIELDS	SEVERE - DEPTH TO ROCK, PERCS SLOWLY
LAGOON 081	SEWAGE LAGOONS	6-7%: SEVERE - DEPTH TO ROCK 7+%: SEVERE - SLOPE, DEPTH TO ROCK
TRENCH 091	SANITARY LANDFILL (TRENCH)	SEVERE - DEPTH TO ROCK
SANARE 101	SANITARY LANDFILL (AREA)	6-8%: SLIGHT 8-15%: MODERATE - SLOPE
COVER 111	DAILY COVER FOR LANDFILL	6-8%: FAIR - TOO CLAYEY, HARD TO PACK 8-15%: FAIR - SLOPE, TOO CLAYEY, HARD TO PACK

COMMUNITY DEVELOPMENT

	FOOTNOTES	
EXCAV 121	SHALLOW EXCAVATIONS	6-8%: MODERATE - DEPTH TO ROCK 8-15%: MODERATE - SLOPE, DEPTH TO ROCK
DWEL 131	DWELLINGS WITHOUT BASEMENTS	6-8%: MODERATE - SHRINK-SWELL 8-15%: MODERATE - SLOPE, SHRINK-SWELL
DWEL 141	DWELLINGS WITH BASEMENTS	6-8%: MODERATE - DEPTH TO ROCK 8-15%: MODERATE - SLOPE, DEPTH TO ROCK
BLDGS 151	SMALL COMMERCIAL BUILDINGS	6-8%: MODERATE - SHRINK-SWELL 8+%: SEVERE - SLOPE
ROADS 161	LOCAL ROADS AND STREETS	SEVERE - SHRINK-SWELL, LOW STRENGTH

REGIONAL INTERPRETATIONS

	FOOTNOTES	
REGION 171		
REGION 181		

SOURCE MATERIAL

KEYING ONLY	FOOTNOTES	
FILL 191	ROADFILL	POOR - THIN LAYER, LOW STRENGTH
SAND 201	SAND	UNSUITED
GRAVEL 211	GRAVEL	UNSUITED
SOIL 221	TOPSOIL	POOR - EXCESS ALKALI

WATER MANAGEMENT

	FOOTNOTES	
PONDRS 231	PONO RESERVOIR AREA	DEPTH TO ROCK, SLOPE
DIKES 241	EMBANKMENTS DIKES AND LEVEES	LOW STRENGTH, THIN LAYER
PONDAQ 251	EXCAVATED PONDS AQUIFER FED	NO WATER
DRAIN 261	DRAINAGE	DEPTH TO ROCK, EXCESS ALKALI, PERCS SLOWLY
IRRIG 271	IRRIGATION	EXCESS ALKALI, PERCS SLOWLY, SLOPE
TERRAC 281	TERRACES AND DIVERSIONS	DEPTH TO ROCK
WATERW 291	GRASSED WATERWAYS	

KEYING ONLY

UNIT NAME: ABSTON
UNIT MODIFIER:

RECREATION

RECORD NO.	CONTROL WORD	NO.		FOOTNOTE
	CAMPS	301	CAMP AREAS	6-8%: MODERATE - PERCS SLOWLY, DUSTY
		2		8-15%: MODERATE - SLOPE, PERCS SLOWLY, DUSTY
		3		
		4		
		5		
	PICNIC	311	PICNIC AREAS	6-8%: MODERATE - DUSTY
		2		8-15%: MOOERATE - SLOPE, OUSTY
		3		
		4		
		5		

KEYING ONLY

				FOOTNOTE
PLAYGO	321	PLAYGROUNDS	SEVERE - SLOPE	
	2			
	3			
	4			
	5			
PATHS	331	PATHS AND TRAILS	MOOERATE - OUSTY	
	2			
	3			
	4			
	5			

CAPABILITY AND PREDICTED YIELDS - CROPS AND PASTURE (HIGH LEVEL MANAGEMENT)

			FOOTNOTE	CAPABILITY													
	CROPHD	451	CLASS-DETERMINING PHASE	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.
		2															
		3															
	CROPS	341	ALL	7E	7E												
		2															
		3															
		4															
		5															
		6															
		7															
		8															
		9															
		351															
		2															
		3															

WOODLAND SUITABILITY

			FOOTNOTE	ORD SYM	MANAGEMENT PROBLEMS					POTENTIAL PRODUCTIVITY		TREES TO PLANT
	WDODS	361	CLASS-DETERMINING PHASE		EROSION HAZARD	EQUIP. LIMIT	SEEDLING MORT'Y.	WINOTH. HAZARD	PLANT COMPET.	IMPORTANT TREES	SITE INDEX	
		2								NONE		
		3										
		4										
		5										
		6										
		7										
		8										
		9										
		371										
		2										
		3										
		4										
		5										
		6										

WIND BREAKS

			FOOTNOTE	SPECIES	HT	SPECIES	HT	SPECIES	HT	SPECIES	HT
	WINDBK	381	CLASS-DETERMINING PHASE								
		2		NONE							
		3									
		4									
		5									
		6									

WILDLIFE HABITAT SUITABILITY

			FOOTNOTE	POTENTIAL FOR HABITAT ELEMENTS								POTENTIAL AS HABITAT FOR:			
	WILDLF	391	CLASS-DETERMINING PHASE	GRAIN & SEED	GRASS & LEGUME	WILD HERB.	HARDWD TREES	CONIFER PLANTS	SHRUBS	WETLAND PLANTS	SHALLOW WATER	OPENLAND WILDLIFE	WOODLAND WILDLIFE	WETLAND WILDLIFE	RANGELAND WILDLIFE
		2	ALL	V. POOR	V. POOR	FAIR	--	--	FAIR	V. POOR	V. POOR	V. POOR	--	V. POOR	FAIR
		3													
		4													
		5													
		6													

POTENTIAL NATIVE PLANT COMMUNITY (RANGELAND OR FOREST UNDERSTORY VEGETATION)

			FOOTNOTE	PLANT SYMBOL (NLSPN)	PERCENTAGE COMPOSITION (DRY WEIGHT) BY CLASS DETERMINING PHASE
	PHASE	401	COMMON PLANT NAME		ALL
		2			
	PLANT	411	THICKSPIKE WHEATGRASS	AGOA	40
		2	MUTTON BLUEGRASS	POFE	10
		3	BIG SAGEBRUSH	ARTR2	10
		4	INDIAN RICEGRASS	ORHY	5
		5	LETTERMAN NEEDLEGRASS	STLE4	5
		6	BOTTLEBRUSH SQUIRRELTAIL	SIHY	5
		7	PRAIRIE JUNEGRASS	KOCR	5
		8	SANDBERG BLUEGRASS	POSE	5
		9	LOW RABBITBRUSH	CHVIH2	5
		421		OTHER	10
		2			
		3			
		4			
		5			
		6			
	PRDDUC	431	POTENTIAL PRODUCTION (LBS./AC. DRY WT): FAVORABLE YEARS		1,400
		2	NORMAL YEARS		1,100
		3	UNFAVORABLE YEARS		600

			SYM.	FOOTNOTES
	NOTES	441		
		2		
		3		
		4		
		5		
		6		
		7		

SCS-SOILS-5
REV. MAY 1972
FILE CODE SOILS-12

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

SOIL SURVEY INTERPRETATIONS

KEYING ONLY: RECORD NO. | CONTROL: WORD MLRA 001; STATE 011

MLRA(S): 34 | KIND OF UNIT: SERIES | UNIT NAME: BLUERIM
STATE: WYOMING | RECORD NO.: | AUTHOR(S): JRS | DATE: 1/73 | REVISED: | UNIT MODIFIER:

CLASSIFICATION AND BRIEF SOIL DESCRIPTION

CLASS 021: BOROLLIC HAPLARGIDS, FINE-LOAMY, MIXED

DESCR 031: THE BLUERIM SERIES ARE WELL DRAINED SOILS FORMED IN RESIDUUM FROM SHALE INTERBEDDED WITH ARKOSIC SANDSTONE ON HILLSIDES. SLOPES ARE 3 TO 20 PERCENT. PRECIPITATION IS 10 TO 12 INCHES, AND MEAN ANNUAL TEMPERATURE IS ABOUT 36°F. TYPICALLY, THE SURFACE LAYER IS BROWN SANDY LOAM ABOUT 3 INCHES THICK. THE UPPER PART OF THE SUBSOIL IS BROWN SANDY CLAY LOAM ABOUT 15 INCHES THICK. THE LOWER PART OF THE SUBSOIL IS GRAYISH BROWN SANDY LOAM ABOUT 6 INCHES THICK. THE SUBSTRATUM IS LIGHT OLIVE BROWN SANDY LOAM ABOUT 5 INCHES THICK AND IS UNDERLAIN BY SOFT SANDY SHALE AT A DEPTH OF 29 INCHES.

ESTIMATED SOIL PROPERTIES

	FOOTNOTE: DEPTH (IN.)	USDA TEXTURE	UNIFIED	AASHO	FRACT. >3 IN. (PCT)	PERCENT OF MATERIAL LESS THAN 3 IN. PASSING SIEVE: 4	10	40	200	LIQUID LIMIT	PLASTICITY INDEX
PROP 041	0-18	SCL	SM-SC, SC	A-2, A-6	0	95-100	75-90	60-70	30-40	20-30	5-15
2	18-29	SL	SM	A-2	0	95-100	75-90	40-55	20-30	NP	NP
3	29	WB	--	--	--	--	--	--	--	--	--
4											
5											
6											

	DEPTH (IN.)	PERMEABILITY (IN/HR)	AVAILABLE WATER CAPACITY (IN/IN)	SOIL REACTION (pH)	SALINITY (MMHOS/CM)	SHRINK-SWELL POTENTIAL	CORROSIVITY: STEEL	CONCRETE	EROSION FACTORS: K	T	WIND EROD. GROUP
PROP 051	SAME DEPTH AS ABOVE	.6-2.0	.14-.16	6.6-7.8	--	LOW	HIGH	LOW	.24	3	3
2		2.0-6.0	.11-.13	7.4-9.0	0-4.0	LOW	HIGH	LOW	.20		
3		--	--	--	--	--	--	--			
4											
5											
6											

	FLOODING: FREQUENCY	DURATION	MONTHS	HIGH WATER TABLE: DEPTH (FT)	KIND	MONTHS	CEMENTED PAN: DEPTH (IN)	HARDNESS	BEDROCK: DEPTH (IN)	HARDNESS	SUBSIDENCE: INITIAL (IN)	TOTAL (IN)	HYD GRP	POTENTIAL FROST ACTION
PROP 061	NONE			>6			--		20-40	RIPPABLE	--		B	LOW

SANITARY FACILITIES

	FOOTNOTES	
SEPTIC 071	SEPTIC TANK ABSORPTION FIELDS	3-15%: SEVERE - DEPTH TO ROCK 15+%: SEVERE - SLOPE, DEPTH TO ROCK
LAGOON 081	SEWAGE LAGOONS	3-7%: SEVERE - DEPTH TO ROCK 7+%: SEVERE - SLOPE, DEPTH TO ROCK
TRENCH 091	SANITARY LANDFILL (TRENCH)	SEVERE - DEPTH TO ROCK
SANARE 101	SANITARY LANDFILL (AREA)	3-8%: SLIGHT 8-15%: MODERATE - SLOPE 15+%: SEVERE - SLOPE
COVER 111	DAILY COVER FOR LANDFILL	3-8%: FAIR - THIN LAYER 8-15%: FAIR - SLOPE, THIN LAYER 15+%: POOR - SLOPE

COMMUNITY DEVELOPMENT

	FOOTNOTES	
EXCAV 121	SHALLOW EXCAVATIONS	3-8%: MODERATE - DEPTH TO ROCK 8-15%: MODERATE - SLOPE, DEPTH TO ROCK 15+%: SEVERE - SLOPE
DWEL 131	DWELLINGS WITHOUT BASEMENTS	3-8%: SLIGHT 8-15%: MODERATE - SLOPE 15+%: SEVERE - SLOPE
DWEL 141	DWELLINGS WITH BASEMENTS	3-8%: MODERATE - DEPTH TO ROCK 8-15%: MODERATE - SLOPE, DEPTH TO ROCK 15+%: SEVERE - SLOPE
BLDGS 151	SMALL COMMERCIAL BUILDINGS	3-4%: SLIGHT 4-8%: MODERATE - SLOPE 8+%: SEVERE - SLOPE
ROADS 161	LOCAL ROADS AND STREETS	3-8%: MODERATE - LOW STRENGTH 8-15%: MODERATE - SLOPE, LOW STRENGTH 15+%: SEVERE - SLOPE

REGIONAL INTERPRETATIONS

	FOOTNOTES	
REGION 171		
REGION 181		

SOURCE MATERIAL

KEYING ONLY	FOOTNOTES	
FILL 191	ROADFILL	POOR - THIN LAYER
SAND 201	SAND	UNSUITED
GRAVEL 211	GRAVEL	UNSUITED
SOIL 221	TOPSOIL	3-8%: FAIR - TOO CLAYEY 8-15%: FAIR - SLOPE, TOO CLAYEY 15+%: POOR - SLOPE

WATER MANAGEMENT

	FOOTNOTES	
PONDRS 231	POND RESERVOIR AREA	DEPTH TO ROCK, SLOPE
DIKES 241	EMBANKMENTS DIKES AND LEVEES	PERCS RAPIDLY, LOW STRENGTH, THIN LAYER
PONDAQ 251	EXCAVATED PONDS AQUIFER FED	NO WATER
DRAIN 261	DRAINAGE	DEPTH TO ROCK
IRRIG 271	IRRIGATION	SLOPE, ROOTING DEPTH
TERRAC 281	TERRACES AND DIVERSIONS	3-10%: DEPTH TO ROCK 10+%: SLOPE, DEPTH TO ROCK
WATERW 291	GRASSED WATERWAYS	

KEYING ONLY — RECORD NO. / CONTROL WORD / NO.

UNIT NAME: BLUERIM (2)

UNIT MODIFIER:

RECREATION

KEYING ONLY					
CAMPS	301	CAMP AREAS	FOOTNOTE: 3-8%: SLIGHT; 8-15%: MODERATE - SLOPE; 15+%: SEVERE - SLOPE		
PICNIC	311	PICNIC AREAS	FOOTNOTE: 3-8%: SLIGHT; 8-15%: MODERATE - SLOPE; 15+%: SEVERE - SLOPE		
PLAYGO	321	PLAYGROUNDS	FOOTNOTE: 3-6%: MODERATE - SLOPE, DEPTH TO ROCK; 6+%: SEVERE - SLOPE		
PATHS	331	PATHS AND TRAILS	FOOTNOTE: 3-15%: SLIGHT; 15-20%: MODERATE - SLOPE		

CAPABILITY AND PREDICTED YIELDS - CROPS AND PASTURE (HIGH LEVEL MANAGEMENT)

FOOTNOTE

CROPHO 451

CROPS		CLASS-DETERMINING PHASE	CAPABILITY NIRR	CAPABILITY IRR.														
341	1	3-6%	6E	4E														
	2	6-9%	6E	4E														
	3	10-15%	6E	6E														
	4	15-20%:	6E	--														
	5																	
	6																	
	7																	
	8																	
	9																	
351	1																	
	2																	
	3																	

WOODLAND SUITABILITY

FOOTNOTE

WOODS		CLASS-DETERMINING PHASE	ORD SYM	MANAGEMENT PROBLEMS: EROSION HAZARD	EQUIP. LIMIT	SEEDLING MORT'Y.	WINDTH. HAZARD	PLANT COMPET.	POTENTIAL PRODUCTIVITY: IMPORTANT TREES	SITE INDEX	TREES TO PLANT
361	1								NONE		
	2										
	3										
	4										
	5										
	6										
	7										
	8										
	9										
371	1										
	2										
	3										
	4										
	5										
	6										

WIND BREAKS

FOOTNOTE

WINOBK		CLASS-DETERMINING PHASE	SPECIES	HT	SPECIES	HT	SPECIES	HT	SPECIES	HT
381	1		NONE							
	2									
	3									
	4									
	5									
	6									

WILDLIFE HABITAT SUITABILITY

FOOTNOTE

WILDLF		CLASS-DETERMINING PHASE	POTENTIAL FOR HABITAT ELEMENTS: GRAIN & SEED	GRASS & LEGUME	WILD HERB.	HARDWO TREES	CONIFER PLANTS	SHRUBS	WETLAND PLANTS	SHALLOW WATER	POTENTIAL AS HABITAT FOR: OPENLAND WILDLIFE	WOODLAND WILDLIFE	WETLAND WILDLIFE	RANGELAND WILDLIFE
391	1	ALL NIRR	POOR	POOR	FAIR	--	--	FAIR	V. POOR	V. POOR	POOR	--	V. POOR	FAIR
	2													
	3													
	4													
	5													
	6													

POTENTIAL NATIVE PLANT COMMUNITY (RANGELAND OR FOREST UNDERSTORY VEGETATION)

FOOTNOTE

PHASE		COMMON PLANT NAME	PLANT SYMBOL (NLSPN)	PERCENTAGE COMPOSITION (DRY WEIGHT) BY CLASS DETERMINING PHASE
401	1			
402	1			
PLANT	411	NEEDLEANDTHREAD	STC04	15
	2	LETTERMAN NEEDLEGRASS	STLE4	10
	3	BLUEBUNCH WHEATGRASS	AGSP	10
	4	CANBY BLUEGRASS	POCA	10
	5	INDIAN RICEGRASS	ORHY	5
	6	THICKSPIKE WHEATGRASS	AGOA	20
	7	PRAIRIE JUNEGRASS	KOCR	5
	8	BIG SAGEBRUSH	ARTR2	15
	9		OTHER	10
421	1			
	2			
	3			
	4			
	5			
	6			

PRODUC		POTENTIAL PRODUCTION (LBS./AC. DRY WT):	
431	1	FAVORABLE YEARS	1,500
	2	NORMAL YEARS	1,200
	3	UNFAVORABLE YEARS	700

FOOTNOTES

NOTES		SYM.	
441	1	1	WATER FOR IRRIGATION NOT AVAILABLE AT PRESENT.
	2		
	3		
	4		
	5		
	6		
	7		

SCS-SOILS-5
REV. MAY 1972
FILE CODE SOILS-12

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

SOIL SURVEY INTERPRETATIONS

KEYING ONLY: RECORD NO. | CONTROL: WORD MLRA 001; STATE 011

MLRA(S) 34 | KIND OF UNIT: SERIES | UNIT NAME: BODORUMPE
STATE: WYOMING | RECORD NO. | AUTHOR(S): JRS | DATE: 1/73 | REVISED | UNIT MODIFIER

CLASSIFICATION AND BRIEF SOIL DESCRIPTION

CLASS 021: TYPIC TORRIPSAMMENTS, MIXED, FRIGID

DESCR 031: THE BODORUMPE SERIES ARE WELL DRAINED SOILS FORMED IN WIND DEPOSITED SAND ON UNDULATING TO HILLY UPLANDS. SLOPES ARE 3 TO 15 PERCENT. ELEVATION IS 6,700 TO 7,000 FEET. PRECIPITATION IS 7 TO 9 INCHES, MEAN ANNUAL AIR TEMPERATURE IS ABOUT 36°F., AND THE GROWING SEASON IS 80 TO 90 DAYS. TYPICALLY, THE SURFACE LAYER IS PALE BROWN FINE SAND ABOUT 3 INCHES THICK. THE UNDERLYING LAYER IS PALE BROWN LOAMY FINE SAND TO GRAYISH BROWN FINE SAND ABOUT 33 INCHES THICK AND IS UNDERLAIN BY SOFT SHALE AT A DEPTH OF 36 INCHES.

ESTIMATED SOIL PROPERTIES

	FOOTNOTE	DEPTH (IN.)	USDA TEXTURE	UNIFIED	AASHO	FRACT. >3 IN. (PCT)	PERCENT OF MATERIAL LESS THAN 3 IN. PASSING SIEVE: 4	10	40	200	LIQUID LIMIT	PLASTICITY INDEX
PROP 041		0-36	LFS, FS	SM	A-2	0	100	100	60-80	15-30	NP	NP
2		36	WB	--	--	--	--	--	--	--	--	--

	DEPTH (IN.)	PERMEABILITY (IN/HR)	AVAILABLE WATER CAPACITY (IN/IN)	SOIL REACTION (PH)	SALINITY (MMHOS/CM)	SHRINK-SWELL POTENTIAL	CORROSIVITY: STEEL	CORROSIVITY: CONCRETE	EROSION FACTORS: K	EROSION FACTORS: T	WIND EROD. GROUP
PROP 051	SAME DEPTH AS ABOVE	6.0-20.0	.06-.10	6.6-7.8	--	LOW	HIGH	LOW	.10	3	1

	FLOODING: FREQUENCY	DURATION	MONTHS	HIGH WATER TABLE: DEPTH (FT)	KIND	MONTHS	CEMENTED PAN: DEPTH (IN)	HARDNESS	BEDROCK: DEPTH (IN)	HARDNESS	SUBSIDENCE: INITIAL (IN)	TOTAL (IN)	HYD GRP	POTENTIAL FROST ACTION
PROP 061	NONE			>6			--		20-40	RIPPABLE	--		A	LOW

SANITARY FACILITIES

	FOOTNOTES	SANITARY FACILITIES
SEPTIC 071	SEPTIC TANK ABSORPTION FIELDS	SEVERE - DEPTH TO ROCK
LAGOON 081	SEWAGE LAGOONS	3-7%: SEVERE - DEPTH TO ROCK, PERCS RAPIDLY 7+%: SEVERE - SLOPE, DEPTH TO ROCK, PERCS RAPIDLY
TRENCH 091	SANITARY LANDFILL (TRENCH)	SEVERE - DEPTH TO ROCK, PERCS RAPIDLY
SANARE 101	SANITARY LANDFILL (AREA)	SEVERE - PERCS RAPIDLY
COVER 111	DAILY COVER FOR LANDFILL	POOR - TOO SANDY

COMMUNITY DEVELOPMENT

	FOOTNOTES	COMMUNITY DEVELOPMENT
EXCAV 121	SHALLOW EXCAVATIONS	SEVERE - CUTBANKS CAVE
DWEL 131	DWELLINGS WITHOUT BASEMENTS	3-8%: SLIGHT 8-15%: MODERATE - SLOPE
DWEL 141	DWELLINGS WITH BASEMENTS	3-8%: MODERATE - DEPTH TO ROCK 8-15%: MODERATE - SLOPE, DEPTH TO ROCK
BLDGS 151	SMALL COMMERCIAL BUILDINGS	3-4%: SLIGHT 4-8%: MODERATE - SLOPE 8+%: SEVERE - SLOPE
ROADS 161	LOCAL ROADS AND STREETS	3-8%: SLIGHT 8-15%: MODERATE - SLOPE

REGIONAL INTERPRETATIONS

	FOOTNOTES	REGIONAL INTERPRETATIONS
REGION 171		
REGION 181		

SOURCE MATERIAL

KEYING ONLY	FOOTNOTES	SOURCE MATERIAL
FILL 191	ROADFILL	POOR - THIN LAYER
SAND 201	SAND	POOR - EXCESS FINES
GRAVEL 211	GRAVEL	UNSUITED
SOIL 221	TOPSOIL	POOR - TOO SANDY

WATER MANAGEMENT

	FOOTNOTES	WATER MANAGEMENT
PONDRS 231	PONO RESERVOIR AREA	PERCS RAPIDLY, DEPTH TO ROCK, SLOPE
DIKES 241	EMBANKMENTS DIKES AND LEVEES	PERCS RAPIDLY, PIPING, THIN LAYER
PONDAQ 251	EXCAVATED PONDS AQUIFER FED	NO WATER
DRAIN 261	DRAINAGE	DEPTH TO ROCK, CUTBANKS CAVE
IRRIG 271	IRRIGATION	SLOPE, ERODES EASILY, ROOTING DEPTH
TERRAC 281	TERRACES AND DIVERSIONS	DEPTH TO ROCK, TOO SANDY
WATERW 291	GRASSED WATERWAYS	

KEYING ONLY — RECORD NO. — CONTROL WORD — NO.

UNIT NAME: BODORUMPE
UNIT MODIFIER:

RECREATION

KEYING ONLY			FOOTNOTE
CAMPS	301	CAMP AREAS	SEVERE - TOO SANDY
PICNIC	311	PICNIC AREAS	SEVERE - TOO SANDY
PLAYGO	321	PLAYGROUNDS	3-6%: SEVERE - TOO SANDY 6+%: SEVERE - SLOPE, TOO SANDY
PATHS	331	PATHS AND TRAILS	SEVERE - TOO SANDY

CAPABILITY AND PREDICTED YIELDS - CROPS AND PASTURE (HIGH LEVEL MANAGEMENT)

FOOTNOTE

CROPHO 451	CLASS-DETERMINING PHASE	CAPABILITY NIRR	CAPABILITY IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.
CROPS 341	3-6%	7E	4E														
2	6-9%:	7E	4E														
3	10-15%	7E	6E														
4																	
5																	
6																	
7																	
8																	
9																	
351																	
2																	
3																	

WOODLAND SUITABILITY

FOOTNOTE

WOODS 361	CLASS-DETERMINING PHASE	ORD SYM	MANAGEMENT PROBLEMS: EROSION HAZARD	EQUIP. LIMIT	SEEDLING MORT'Y.	WINDTH. HAZARD	PLANT COMPET.	POTENTIAL PRODUCTIVITY: IMPORTANT TREES	SITE INDEX	TREES TO PLANT
								NONE		
371										

WIND BREAKS

FOOTNOTE

WINOBK 381	CLASS-DETERMINING PHASE	SPECIES	HT	SPECIES	HT	SPECIES	HT	SPECIES	HT
		NONE							

WILDLIFE HABITAT SUITABILITY

FOOTNOTE

WILOLF 391	CLASS-DETERMINING PHASE	POTENTIAL FOR HABITAT ELEMENTS: GRAIN & SEED	GRASS & LEGUME	WILD HERB.	HARDWD TREES	CONIFER PLANTS	SHRUBS	WETLAND PLANTS	SHALLOW WATER	POTENTIAL AS HABITAT FOR: OPENLAND WILDLIFE	WOODLAND WILDLIFE	WETLAND WILDLIFE	RANGELAND WILDLIFE
	ALL NIRR	V. POOR	V. POOR	POOR	--	--	POOR	V. POOR	V. POOR	V. POOR	--	V. POOR	POOR

POTENTIAL NATIVE PLANT COMMUNITY (RANGELAND OR FOREST UNDERSTORY VEGETATION)

FOOTNOTE

PHASE 401			
PLANT 411	COMMON PLANT NAME	PLANT SYMBOL (NLSPN)	PERCENTAGE COMPOSITION (DRY WEIGHT) BY CLASS DETERMINING PHASE
2	NEEDLEANDTHREAD	STCO4	30
3	THICKSPIKE WHEATGRASS	AGDA	15
4	SPINY HOPSAGE	GRSP	10
5	BOTTLEBRUSH SQUIRRELTAIL	SIHY	5
6	NEEDLELEAF SEDGE	CAEL2	5
7	SANDBERG BLUEGRASS	POSE	5
8	RUBBER RABBITBRUSH	CHNA2	5
9	SHADSCALE	ATCO	5
421	SPINY HORSEBRUSH	TESP2	5
2		OTHER	15
3			
4			
5			
6			

PRODUC 431		
2	POTENTIAL PRODUCTION (LBS./AC. DRY WT): FAVORABLE YEARS	700
3	NORMAL YEARS	500
	UNFAVORABLE YEARS	350

FOOTNOTES

NOTES 441	SYM.	
2	1	WATER FOR IRRIGATION NOT AVAILABLE AT PRESENT TIME.
3		
4		
5		
6		
7		

SCS-SOILS-5
REV. MAY 1972
FILE CODE SOILS-12

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

SOIL SURVEY INTERPRETATIONS

KEYING ONLY — RECORD NO. — CONTROL WORD: MLRA 001; STATE 011

MLRA(S): 34 | KIND OF UNIT: SERIES | UNIT NAME: COALMONT
STATE: WYOMING | RECORD NO.: | AUTHOR(S): JRS | DATE: 1/73 | REVISED: | UNIT MODIFIER:

CLASSIFICATION AND BRIEF SOIL DESCRIPTION

CLASS 021: BOROLLIC PALEARGIDS, FINE, MONTMORILLONITIC,

OESCR 031: THE COALMONT SERIES ARE WELL DRAINED SOILS FORMED IN RESIDUUM FROM SHALE ON UPLANDS. SLOPES ARE 3 TO 15 PERCENT. PRECIPITATION IS 10 TO 14 INCHES. TYPICALLY, THE SURFACE LAYER IS BROWN FINE SANDY LOAM ABOUT 2 INCHES THICK. THE SUBSURFACE LAYER IS LIGHT BROWNISH GRAY SANDY LOAM ABOUT 2 INCHES THICK. THE SUBSOIL IS ABOUT 20 INCHES THICK. IN SEQUENCE FROM THE TOP THE UPPER 5 INCHES IS BROWN SILTY CLAY; THE NEXT 5 INCHES IS BROWN CLAY LOAM; THE NEXT 7 INCHES IS PINKISH GRAY CLAY LOAM; AND THE LOWER 3 INCHES IS BROWN CLAY LOAM AND IS UNDERLAIN BY SOFT SHALE AT A DEPTH OF 24 INCHES.

ESTIMATED SOIL PROPERTIES

	FOOTNOTE	OEPTH (IN.)	USDA TEXTURE	UNIFIED	AASHO	FRACT. >3 IN. (PCT)	PERCENT OF MATERIAL LESS THAN 3 IN. PASSING SIEVE 4	10	40	200	LIQUID LIMIT	PLASTICITY INDEX
PROP 041		0-4	FSL, SL	SM	A-4	0	90-100	90-100	65-80	35-50	NP	NP
2		4-24	CL	CL	A-6	0	90-100	90-100	85-95	55-75	35-45	15-25
3		24+	WB	--	--	--	--	--	--	--	--	--
4												
5												
6												

	DEPTH (IN.)	PERMEABILITY (IN/HR)	AVAILABLE WATER CAPACITY (IN/IN)	SOIL REACTION (pH)	SALINITY (MMHOS/CM)	SHRINK-SWELL POTENTIAL	CORROSIVITY STEEL	CORROSIVITY CONCRETE	EROSION FACTORS K	EROSION FACTORS T	WIND EROD. GROUP
PROP 051		2.0-6.0	.12-.14	6.6-7.8	NONE	LOW	HIGH	LOW	.20	3	3
2	SAME DEPTH AS ABOVE	.06-.6	.19-.21	6.6-9.0	2.0-4.0	MODERATE	HIGH	LOW	.37		
3											
4											
5											
6											

	FLOODING FREQUENCY	FLOODING DURATION	FLOODING MONTHS	HIGH WATER TABLE DEPTH (FT)	HIGH WATER TABLE KIND	HIGH WATER TABLE MONTHS	CEMENTED PAN DEPTH (IN)	CEMENTED PAN HARDNESS	BEDROCK DEPTH (IN)	BEDROCK HARDNESS	SUBSIDENCE INITIAL (IN)	SUBSIDENCE TOTAL (IN)	HYD GRP	POTENTIAL FROST ACTION
PROP 061	NONE			>6			--		20-40	RIPPABLE	--	--	C	LOW

SANITARY FACILITIES

	FOOTNOTES	
SEPTIC 071	SEPTIC TANK ABSORPTION FIELDS	SEVERE - PERCS SLOWLY, DEPTH TO ROCK
LAGOON 081	SEWAGE LAGOONS	3-7%: SEVERE - DEPTH TO ROCK 7+%: SEVERE - SLOPE, DEPTH TO ROCK
TRENCH 091	SANITARY LANDFILL (TRENCH)	MODERATE - TOO CLAYEY
SANARE 101	SANITARY LANDFILL (AREA)	3-8%: SLIGHT 8-15%: MODERATE - SLOPE
COVER 111	DAILY COVER FOR LANDFILL	3-8%: MODERATE - TOO CLAYEY, THIN LAYER 8-15%: MODERATE - SLOPE, TOO CLAYEY, THIN LAYER

COMMUNITY DEVELOPMENT

	FOOTNOTES	
EXCAV 121	SHALLOW EXCAVATIONS	3-8%: MODERATE - TOO CLAYEY, DEPTH TO ROCK 8-15%: MODERATE - TOO CLAYEY, DEPTH TO ROCK, SLOPE
DWEL 131	DWELLINGS WITHOUT BASEMENTS	3-8%: MODERATE - LOW STRENGTH, SHRINK-SWELL 8-15%: MODERATE - SLOPE, LOW STRENGTH, SHRINK-SWELL
DWEL 141	DWELLINGS WITH BASEMENTS	3-8%: MODERATE - SHRINK-SWELL, DEPTH TO ROCK, LOW STRENGTH 8-15%: MODERATE - SLOPE, DEPTH TO ROCK, LOW STRENGTH
BLDGS 151	SMALL COMMERCIAL BUILDINGS	3-4%: MODERATE - SHRINK-SWELL, LOW STRENGTH 4-8%: MODERATE - SLOPE, SHRINK-SWELL, LOW STRENGTH 8+%: SEVERE - SLOPE
ROADS 161	LOCAL ROADS AND STREETS	SEVERE - LOW STRENGTH

REGIONAL INTERPRETATIONS

	FOOTNOTES	
REGION 171		
REGION 181		

KEYING ONLY

SOURCE MATERIAL

	FOOTNOTES	
FILL 191	ROADFILL	POOR - THIN LAYER, LOW STRENGTH
SAND 201	SAND	UNSUITED
GRAVEL 211	GRAVEL	UNSUITED
SOIL 221	TOPSOIL	3-8%: FAIR - TOO CLAYEY 8-15%: FAIR - TOO CLAYEY, SLOPE

WATER MANAGEMENT

	FOOTNOTES	
PONDRS 231	POND RESERVOIR AREA	SLOPE, DEPTH TO ROCK
DIKES 241	EMBANKMENTS DIKES AND LEVEES	LOW STRENGTH, THIN LAYER
PONDAQ 251	EXCAVATED PONDS AQUIFER FED	NO WATER
DRAIN 261	DRAINAGE	PERCS SLOWLY, DEPTH TO ROCK
IRRIG 271	IRRIGATION	PERCS SLOWLY, SLOPE, ROOTING DEPTH
TERRAC 281	TERRACES AND DIVERSIONS	--
WATERW 291	GRASSED WATERWAYS	--

UNIT NAME: COALMONT
UNIT MODIFIER:

RECREATION

KEYING ONLY RECORD NO.	CONTROL WORD	CONTROL NO.		FOOTNOTE
	CAMPS	301	CAMP AREAS	3-8%: MODERATE - PERCS SLOWLY 8-15%: MODERATE - SLOPE, PERCS SLOWLY
	PICNIC	311	PICNIC AREAS	3-8%: SLIGHT 8-15%: MODERATE - SLOPE
	PLAYGO	321	PLAYGROUNDS	3-6%: MODERATE - SLOPE, DEPTH TO ROCK, PERCS SLOWLY 6+%: SEVERE - SLOPE
	PATHS	331	PATHS AND TRAILS	SLIGHT

CAPABILITY AND PREDICTED YIELDS - CROPS AND PASTURE (HIGH LEVEL MANAGEMENT)

KEYING ONLY			FOOTNOTE	CLASS-DETERMINING PHASE	CAPABILITY													
RECORD NO.	CONTROL WORD	CONTROL NO.			NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.
	CROPHO	451																
	CROPS	341		3-6%	6E	4E												
		351		6-9%	6E	4E												
				10-15%	6E	6E												

WOODLAND SUITABILITY

KEYING ONLY RECORD NO.	CONTROL WORD	CONTROL NO.	FOOTNOTE	CLASS-DETERMINING PHASE	ORD SYM	MANAGEMENT PROBLEMS: EROSION HAZARD	EQUIP. LIMIT	SEEDLING MORT'Y.	WINDTH. HAZARD	PLANT COMPET.	POTENTIAL PRODUCTIVITY: IMPORTANT TREES	SITE INDEX	TREES TO PLANT
	WOODS	361									NONE		
		371											

WIND BREAKS

KEYING ONLY RECORD NO.	CONTROL WORD	CONTROL NO.	FOOTNOTE	CLASS-DETERMINING PHASE	SPECIES	HT	SPECIES	HT	SPECIES	HT	SPECIES	HT
	WINOBK	381			NONE							

WILDLIFE HABITAT SUITABILITY

KEYING ONLY RECORD NO.	CONTROL WORD	CONTROL NO.	FOOTNOTE	CLASS-DETERMINING PHASE	POTENTIAL FOR HABITAT ELEMENTS: GRAIN & SEED	GRASS & LEGUME	WILD HERB.	HARDWO TREES	CONIFER PLANTS	SHRUBS	WETLAND PLANTS	SHALLOW WATER	POTENTIAL AS HABITAT FOR: OPENLAND WILDLIFE	WOODLAND WILDLIFE	WETLAND WILDLIFE	RANGELAND WILDLIFE
	WILOLF	391		ALL NIRR	POOR	POOR	FAIR	--	--	FAIR	V. POOR	V. POOR	POOR	--	V. POOR	FAIR

POTENTIAL NATIVE PLANT COMMUNITY (RANGELAND OR FOREST UNDERSTORY VEGETATION)

KEYING ONLY RECORD NO.	CONTROL WORD	CONTROL NO.	FOOTNOTE	COMMON PLANT NAME	PLANT SYMBOL (NLSPN)	PERCENTAGE COMPOSITION (DRY WEIGHT) BY CLASS DETERMINING PHASE
	PHASE	401				
	PLANT	411		THICKSPIKE WHEATGRASS	AGOA	40
				MUTTON BLUEGRASS	POFE	10
				BIG SAGEBRUSH	ARTR2	10
				INDIAN RICEGRASS	ORHY	5
				LETTERMAN NEEDLEGRASS	STLE4	5
				BOTTLEBRUSH SQUIRRELTAIL	SIHY	5
				PRAIRIE JUNEGRASS	KOCR	5
				SANDBERG BLUEGRASS	POSE	5
				LOW RABBITBRUSH	CHVIH2	5
					OTHER	10
	PROOUC	431		POTENTIAL PRODUCTION (LBS./AC. ORY WT): FAVORABLE YEARS		1,400
				NORMAL YEARS		1,100
				UNFAVORABLE YEARS		600

FOOTNOTES

KEYING ONLY RECORD NO.	CONTROL WORD	CONTROL NO.	SYM.	
	NOTES	441		

SCS-SOILS-5
REV. MAY 1972
FILE CODE SOILS-12

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

SOIL SURVEY INTERPRETATIONS

KEYING ONLY: RECORD NO. | CONTROL WORD | CONTROL NO.

MLRA(S) 34 | KIND OF UNIT SERIES | UNIT NAME COTHA
STATE WYOMING | RECORD NO. | AUTHOR(S) JRS | DATE 1 73 | REVISED | UNIT MODIFIER

CLASSIFICATION AND BRIEF SOIL DESCRIPTION

CLASS 021: BOROLLIC HAPLARGIDS, COARSE-LOAMY, MIXED

DESCR 031: THE COTHA SERIES ARE WELL DRAINED SOILS FORMED IN RESIDUUM FROM SANDSTONE ON UPLANDS. SLOPES ARE 3 TO 15 PERCENT. ELEVATION IS 7,000 TO 7,300 FEET. PRECIPITATION IS 10 TO 12 INCHES, MEAN ANNUAL SOIL TEMPERATURE IS ABOUT 36°F., AND THE GROWING SEASON IS 80 TO 90 DAYS. TYPICALLY, THE SURFACE LAYER IS PALE BROWN SANDY LOAM ABOUT 4 INCHES THICK. THE SUBSOIL IS BROWN TO YELLOWISH BROWN SANDY LOAM ABOUT 24 INCHES THICK. THE SUBSTRATUM IS LIGHT YELLOWISH BROWN SANDY LOAM ABOUT 6 INCHES THICK AND IS UNDERLAIN BY SOFT SANDSTONE AT A DEPTH OF 34 INCHES.

ESTIMATED SOIL PROPERTIES

	FOOTNOTE	DEPTH (IN.)	USDA TEXTURE	UNIFIED	AASHO	FRACT. >3 IN. (PCT)	PERCENT OF MATERIAL LESS THAN 3 IN. PASSING SIEVE 4	10	40	200	LIQUID LIMIT	PLASTICITY INDEX
PROP 041		0-34	SL	SM, SM-SC	A-2	0	80-90	75-90	45-65	20-35	15-25	0-5
2		34	WB	--	--	--	--	--	--	--	--	--

	DEPTH (IN.)	PERMEABILITY (IN/HR)	AVAILABLE WATER CAPACITY (IN/IN)	SOIL REACTION (pH)	SALINITY (MMHOS/CM)	SHRINK-SWELL POTENTIAL	CORROSIVITY STEEL	CORROSIVITY CONCRETE	EROSION FACTORS K	EROSION FACTORS T	WIND EROD. GROUP
PROP 051	0-34	2.0-6.0	.11-.13	6.6-7.8	--	LOW	HIGH	LOW	.20	3	3
2	34	WB	--	--	--	--	--	--	--	--	--

	FLOODING FREQUENCY	FLOODING DURATION	FLOODING MONTHS	HIGH WATER TABLE DEPTH (FT)	HIGH WATER TABLE KIND	HIGH WATER TABLE MONTHS	CEMENTED PAN DEPTH (IN)	CEMENTED PAN HARDNESS	BEDROCK DEPTH (IN)	BEDROCK HARDNESS	SUBSIDENCE INITIAL (IN)	SUBSIDENCE TOTAL (IN)	HYD GRP	POTENTIAL FROST ACTION
PROP 061	NONE			>6			--		20-40	RIPPABLE	--		C	LOW

SANITARY FACILITIES

	FOOTNOTES	
SEPTIC 071	SEPTIC TANK ABSORPTION FIELDS	SEVERE - DEPTH TO ROCK
LAGOON 081	SEWAGE LAGOONS	3-7%: SEVERE - PERCS RAPIDLY, DEPTH TO ROCK 7+%: SEVERE - SLOPE, PERCS RAPIDLY, DEPTH TO ROCK
TRENCH 091	SANITARY LANDFILL (TRENCH)	SEVERE - PERCS RAPIDLY, DEPTH TO ROCK
SANARE 101	SANITARY LANOFILL (AREA)	SEVERE - PERCS RAPIDLY
COVER 111	DAILY COVER FOR LANDFILL	3-8%: FAIR - THIN LAYER 8-15%: FAIR - SLOPE, THIN LAYER

COMMUNITY DEVELOPMENT

	FOOTNOTES	
EXCAV 121	SHALLOW EXCAVATIONS	SEVERE - DEPTH TO ROCK
DWEL 131	DWELLINGS WITHOUT BASEMENTS	3-8%: MODERATE - DEPTH TO ROCK, SLOPE 8-15%: MODERATE - SLOPE, DEPTH TO ROCK
DWEL 141	DWELLINGS WITH BASEMENTS	SEVERE - DEPTH TO ROCK
BLDGS 151	SMALL COMMERCIAL BUILDINGS	3-4%: MODERATE - DEPTH TO ROCK 4-8%: MODERATE - SLOPE, DEPTH TO ROCK 8+%: SEVERE - SLOPE
ROADS 161	LOCAL ROADS AND STREETS	3-8%: SLIGHT 8+%: MODERATE - SLOPE

REGIONAL INTERPRETATIONS

	FOOTNOTES	
REGION 171		
REGION 181		

SOURCE MATERIAL

KEYING ONLY	FOOTNOTES	
FILL 191	ROADFILL	POOR - THIN LAYER
SAND 201	SAND	POOR
GRAVEL 211	GRAVEL	UNSUITED
SOIL 221	TOPSOIL	3-8%: GOOD 8-15%: FAIR - SLOPE

WATER MANAGEMENT

	FOOTNOTES	
PONDRS 231	POND RESERVOIR AREA	PERCS RAPIDLY, DEPTH TO ROCK, SLOPE
DIKES 241	EMBANKMENTS DIKES AND LEVEES	PERCS RAPIDLY, PIPING
PONDAQ 251	EXCAVATED PONDS AQUIFER FED	NO WATER
DRAIN 261	DRAINAGE	DEPTH TO ROCK
IRRIG 271	IRRIGATION	SLOPE, ERODES EASILY, ROOTING DEPTH
TERRAC 281	TERRACES AND DIVERSIONS	--
WATERW 291	GRASSED WATERWAYS	--

KEYING ONLY — RECORD NO. / CONTROL WORD / NO.

UNIT NAME: COTHA (2)
UNIT MODIFIER:

RECREATION

KEYING ONLY				FOOTNOTE
CAMPS	301	CAMP AREAS		3-8%: SLIGHT 8-15%: MODERATE - SLOPE
PICNIC	311	PICNIC AREAS		3-8%: SLIGHT 8-15%: MOOERATE - SLOPE
PLAYGD	321	PLAYGROUNDS		3-6%: MODERATE - SLOPE, OEPTH TO ROCK 6+%: SEVERE - SLOPE
PATHS	331	PATHS AND TRAILS		SLIGHT

CAPABILITY AND PREDICTED YIELDS - CROPS AND PASTURE (HIGH LEVEL MANAGEMENT)

FOOTNOTE

KEYING ONLY		CLASS-OETERMINING PHASE	CAPABILITY NIRR	CAPABILITY IRR.													
CROPHO	451																
CROPS	341	3-6%	6E	4E													
		6-9%	6E	4E													
		10-15%	6E	6E													
	351																

WOODLAND SUITABILITY

FOOTNOTE

KEYING ONLY		CLASS-OETERMINING PHASE	ORO SYM	MANAGEMENT PROBLEMS: EROSION HAZARO	EQUIP. LIMIT	SEEOLING MORT'Y.	WINOTH. HAZARO	PLANT COMPET.	POTENTIAL PROOUCTIVITY: IMPORTANT TREES	SITE INDEX	TREES TO PLANT
WOOOS	361								NONE		
	371										

WIND BREAKS

FOOTNOTE

KEYING ONLY		CLASS-OETERMINING PHASE	SPECIES	HT	SPECIES	HT	SPECIES	HT	SPECIES	HT
WINOBK	381		NONE							

WILDLIFE HABITAT SUITABILITY

FOOTNOTE

KEYING ONLY		CLASS-DETERMINING PHASE	POTENTIAL FOR HABITAT ELEMENTS: GRAIN & SEED	GRASS & LEGUME	WILO HERB.	HAROWO TREES	CONIFER PLANTS	SHRUBS	WETLAND PLANTS	SHALLOW WATER	POTENTIAL AS HABITAT FOR: OPENLAND WILOLIFE	WOOOLANO WILDLIFE	WETLAND WILDLIFE	RANGELAND WILDLIFE
WILOLF	391	ALL NIRR	POOR	POOR	FAIR	--	--	FAIR	V. POOR	V. POOR	POOR	--	V. POOR	FAIR

POTENTIAL NATIVE PLANT COMMUNITY (RANGELAND OR FOREST UNDERSTORY VEGETATION)

FOOTNOTE

KEYING ONLY		COMMON PLANT NAME	PLANT SYMBOL (NLSPN)	PERCENTAGE COMPOSITION (ORY WEIGHT) BY CLASS OETERMINING PHASE
PHASE	401			
PLANT	411	NEEDLEANDTHREAD	STCO4	25
	412	THICKSPIKE WHEATGRASS	AGDA	15
	413	BLUEBUNCH WHEATGRASS	AGSP	10
	414	INDIAN RICEGRASS	ORHY	10
	415	CANBY BLUEGRASS	POCA	10
	416	BIG SAGEBRUSH	ARTR2	10
	417	BOTTLEBRUSH SQUIRRELTAIL	SIHY	5
	418	LOW RABBITBRUSH	CHVIH2	5
	419		OTHER	10
	421			

KEYING ONLY			
PROOUC	431	POTENTIAL PRODUCTION (LBS./AC. ORY WT): FAVORABLE YEARS	1,500
	432	NORMAL YEARS	1,200
	433	UNFAVORABLE YEARS	700

KEYING ONLY		SYM.	FOOTNOTES
NOTES	441		

SCS-SOILS-5
REV. MAY 1972
FILE CODE SOILS-12

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

SOIL SURVEY INTERPRETATIONS

KEYING ONLY: RECORD NO. | CONTROL WORD | NO.

MLRA(S) 34 | KIND OF UNIT SERIES | UNIT NAME COTHRAN
STATE WYOMING | RECORD NO. | AUTHOR(S) JRS | DATE 1/73 | REVISED | UNIT MODIFIER

CLASSIFICATION AND BRIEF SOIL DESCRIPTION

CLASS 021: USTIC TORRIPSAMMENTS, MIXED, FRIGID

DESCR 031: THE COTHRAN SERIES ARE WELL DRAINED SOILS FORMED IN WIND DEPOSITED SANDS ON UPLANDS. SLOPES ARE 3 TO 6 PERCENT. ELEVATION IS 7,000 TO 7,300 FEET. PRECIPITATION IS 10 TO 12 INCHES, MEAN ANNUAL AIR TEMPERATURE IS ABOUT 36°F., AND THE GROWING SEASON IS 80 TO 90 DAYS. TYPICALLY, THE SURFACE LAYER IS BROWN FINE SAND ABOUT 2 INCHES THICK. THE UNDERLYING LAYER IS GRAYISH BROWN TO BROWN LOAMY FINE SAND TO FINE SAND TO 60 INCHES OR MORE.

ESTIMATED SOIL PROPERTIES

	FOOTNOTE	DEPTH (IN.)	USDA TEXTURE	UNIFIED	AASHO	FRACT. >3 IN. (PCT)	PERCENT OF MATERIAL LESS THAN 3 IN. PASSING SIEVE 4	10	40	200	LIQUID LIMIT	PLASTICITY INDEX
PROP 041		0-60	FS, LFS	SM, SP-SM	A-2	0	90-100	85-100	60-75	10-20	NP	NP

	DEPTH (IN.)	PERMEABILITY (IN/HR)	AVAILABLE WATER CAPACITY (IN/IN)	SOIL REACTION (pH)	SALINITY (MMHOS/CM)	SHRINK-SWELL POTENTIAL	CORROSIVITY STEEL	CORROSIVITY CONCRETE	EROSION FACTORS K	EROSION FACTORS T	WIND EROD. GROUP
PROP 051	SAME DEPTH AS ABOVE	6.0-20.0	.05-.08	6.1-7.3	--	LOW	HIGH	LOW	.10	5	1

	FLOODING FREQUENCY	FLOODING DURATION	FLOODING MONTHS	HIGH WATER TABLE DEPTH (FT)	HIGH WATER TABLE KIND	HIGH WATER TABLE MONTHS	CEMENTED PAN DEPTH (IN)	CEMENTED PAN HARDNESS	BEDROCK DEPTH (IN)	BEDROCK HARDNESS	SUBSIDENCE INITIAL (IN)	SUBSIDENCE TOTAL (IN)	HYD GRP	POTENTIAL FROST ACTION
PROP 061	NONE			>6			--		>60	--	--		A	LOW

SANITARY FACILITIES

	FOOTNOTES	SANITARY FACILITIES	KEYING ONLY		FOOTNOTES	SOURCE MATERIAL
SEPTIC 071	SEPTIC TANK ABSORPTION FIELDS	SLIGHT	FILL	191	ROADFILL	GOOD
LAGOON 081	SEWAGE LAGOONS	SEVERE - PERCS RAPIDLY	SAND	201	SAND	FAIR TO POOR
TRENCH 091	SANITARY LANDFILL (TRENCH)	SEVERE - PERCS RAPIDLY	GRAVEL	211	GRAVEL	UNSUITED
SANARE 101	SANITARY LANDFILL (AREA)	SEVERE - PERCS RAPIDLY	SOIL	221	TOPSOIL	POOR - TOO SANDY
COVER 111	DAILY COVER FOR LANDFILL	POOR - TOO SANDY				

COMMUNITY DEVELOPMENT

	FOOTNOTES	COMMUNITY DEVELOPMENT
EXCAV 121	SHALLOW EXCAVATIONS	SEVERE - CUTBANKS CAVE
DWEL 131	DWELLINGS WITHOUT BASEMENTS	SLIGHT
DWEL 141	DWELLINGS WITH BASEMENTS	SLIGHT
BLDGS 151	SMALL COMMERCIAL BUILDINGS	3-4%: SLIGHT 4-6%: MODERATE - SLOPE
ROADS 161	LOCAL ROADS AND STREETS	SLIGHT

REGIONAL INTERPRETATIONS

	FOOTNOTES	REGIONAL INTERPRETATIONS
REGION 171		
REGION 181		

WATER MANAGEMENT

	FOOTNOTES	WATER MANAGEMENT
PONDRS 231	POND RESERVOIR AREA	PERCS RAPIDLY
DIKES 241	EMBANKMENTS DIKES AND LEVEES	PERCS RAPIDLY, PIPING
PONDAQ 251	EXCAVATED PONDS AQUIFER FED	NO WATER
DRAIN 261	DRAINAGE	CUTBANKS CAVE
IRRIG 271	IRRIGATION	ERODES EASILY, DROUGHTY, SLOPE
TERRAC 281	TERRACES AND DIVERSIONS	--
WATERW 291	GRASSED WATERWAYS	--

UNIT NAME: COTHRAN
UNIT MODIFIER:

RECREATION

KEYING ONLY RECORD NO.	CONTROL WORD	NO.		FOOTNOTE
	CAMPS	301	CAMP AREAS	SEVERE - TOO SANOY, OUSTY
	PICNIC	311	PICNIC AREAS	SEVERE - TOO SANDY, DUSTY

KEYING ONLY			FOOTNOTE
PLAYGO	321	PLAYGROUNDS	SEVERE - TOO SANOY, OUSTY
PATHS	331	PATHS AND TRAILS	SEVERE - TOO SANOY, DUSTY

CAPABILITY AND PREDICTED YIELDS - CROPS AND PASTURE (HIGH LEVEL MANAGEMENT)

CROPHO 451 | CROPS 341

FOOTNOTE	CLASS-DETERMINING PHASE	CAPABILITY NIRR	CAPABILITY IRR.														
		NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.
2	3-6	6E	4E														

WOODLAND SUITABILITY

WOODS 361 | 371

FOOTNOTE	CLASS-DETERMINING PHASE	ORD SYM	MANAGEMENT PROBLEMS: EROSION HAZARD	EQUIP. LIMIT	SEEDLING MORT'Y.	WINDTH. HAZARD	PLANT COMPET.	POTENTIAL PRODUCTIVITY: IMPORTANT TREES	SITE INDEX	TREES TO PLANT
								NONE		

WIND BREAKS

WINDBK 381

FOOTNOTE	CLASS-DETERMINING PHASE	SPECIES	HT	SPECIES	HT	SPECIES	HT	SPECIES	HT
		NONE							

WILDLIFE HABITAT SUITABILITY

WILDLF 391

FOOTNOTE	CLASS-DETERMINING PHASE	POTENTIAL FOR HABITAT ELEMENTS: GRAIN & SEED	GRASS & LEGUME	WILD HERB.	HARDWO TREES	CONIFER PLANTS	SHRUBS	WETLAND PLANTS	SHALLOW WATER	POTENTIAL AS HABITAT FOR: OPENLAND WILDLIFE	WOODLAND WILDLIFE	WETLAND WILDLIFE	RANGELAND WILDLIFE
	ALL NIRR	POOR	POOR	FAIR	--	--	FAIR	V. POOR	V. POOR	POOR	--	V. POOR	FAIR

POTENTIAL NATIVE PLANT COMMUNITY (RANGELAND OR FOREST UNDERSTORY VEGETATION)

PHASE 401 | PLANT 411 | PROOUC 431

FOOTNOTE	COMMON PLANT NAME	PLANT SYMBOL (NLSPN)	PERCENTAGE COMPOSITION (DRY WEIGHT) BY CLASS DETERMINING PHASE
	NEEDLEANOTHREAO	STCO4	25
	THICKSPIKE WHEATGRASS	AGDA	25
	INDIAN RICEGRASS	ORHY	10
	NEEDLELEAF SEDGE	CAEL2	5
	PRAIRIE JUNEGRASS	KOCR	5
	SANDBERG BLUEGRASS	POSE	5
	BIG SAGEBRUSH	ARTR2	5
	LOW RABBITBRUSH	CHVIH2	5
		OTHER	15
	POTENTIAL PRODUCTION (LBS./AC. DRY WT): FAVORABLE YEARS		1,700
	NORMAL YEARS		1,400
	UNFAVORABLE YEARS		900

FOOTNOTES

NOTES 441

SYM.	
1	EXCESSIVE PERMEABILITY, RATE MAY CAUSE POLLUTION OF GROUND WATER.
2	WATER FOR IRRIGATION NOT AVAILABLE AT PRESENT.

SCS-SOILS-5
REV. MAY 1972
FILE CODE SOILS-12

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

SOIL SURVEY INTERPRETATIONS

KEYING ONLY — RECORD NO. | CONTROL WORD | NO.
MLRA | 001
STATE | 011

MLRA(S): 34 | KIND OF UNIT: SERIES | UNIT NAME: DEBONE
STATE: WYOMING | RECORD NO. | AUTHOR(S): JRS | DATE: 1/73 | REVISED | UNIT MODIFIER

CLASSIFICATION AND BRIEF SOIL DESCRIPTION

CLASS 021: TYPIC NATRARGIDS, FINE, MONTMORILLONITIC, FRIGID

DESCR 031: THE DEBONE SERIES ARE WELL DRAINED SOILS FORMED IN ALLUVIUM FROM ALKALINE SHALE ON ALLUVIAL FANS. SLOPES ARE 6 TO 10 PERCENT. ELEVATION IS 6,800 TO 7,000 FEET. PRECIPITATION IS 7 to 9 INCHES, MEAN ANNUAL AIR TEMPERATURE IS ABOUT 36°F., AND THE GROWING SEASON IS 80 TO 90 DAYS. TYPICALLY, THE SURFACE LAYER IS BROWN SANDY LOAM TO FINE SANDY LOAM ABOUT 8 INCHES THICK. THE SUBSURFACE LAYER IS PINKISH GRAY SANDY LOAM ABOUT 2 INCHES THICK. THE SUBSOIL IS BROWN SANDY CLAY TO SANDY CLAY LOAM ABOUT 14 INCHES THICK. THE SUBSTRATUM IS LIGHT BROWNISH GRAY SANDY CLAY LOAM TO 60 INCHES OR MORE.

ESTIMATED SOIL PROPERTIES

FOOTNOTE	DEPTH (IN.)	USDA TEXTURE	UNIFIED	AASHO	FRACT. >3 IN. (PCT)	PERCENT OF MATERIAL LESS THAN 3 IN. PASSING SIEVE 4	10	40	200	LIQUID LIMIT	PLASTICITY INDEX
PROP 041	0-10	SL, FSL	SM-SC-SC	A-4	0	100	100	60-75	35-45	10-20	5-10
2	10-60	SCL	SC	A-6	0	90-100	90-100	80-90	35-50	30-40	11-20
3											
4											
5											
6											

	DEPTH (IN.)	PERMEABILITY (IN/HR)	AVAILABLE WATER CAPACITY (IN/IN)	SOIL REACTION (pH)	SALINITY (MMHOS/CM)	SHRINK-SWELL POTENTIAL	CORROSIVITY STEEL	CORROSIVITY CONCRETE	EROSION FACTORS K	EROSION FACTORS T	WIND EROD. GROUP
PROP 051	SAME DEPTH AS ABOVE	2.0-6.0	.12-.14	6.6-7.8	--	LOW	HIGH	LOW	.20	5	3
2		.06-.6	.08-.10	8.5->9.0	2.0-8.0	MODERATE	HIGH	MODERATE	.24		
3											
4											
5											
6											

	FLOODING FREQUENCY	FLOODING DURATION	FLOODING MONTHS	HIGH WATER TABLE DEPTH (FT)	HIGH WATER TABLE KIND	HIGH WATER TABLE MONTHS	CEMENTED PAN DEPTH (IN)	CEMENTED PAN HARDNESS	BEDROCK DEPTH (IN)	BEDROCK HARDNESS	SUBSIDENCE INITIAL (IN)	SUBSIDENCE TOTAL (IN)	HYD GRP	POTENTIAL FROST ACTION
PROP 061	NONE			>6			--		60	RIPPABLE	--		D	LOW

SANITARY FACILITIES

	FOOTNOTES	
SEPTIC 071	SEPTIC TANK ABSORPTION FIELDS	SEVERE - PERCS SLOWLY
LAGOON 081	SEWAGE LAGOONS	6-7%: MODERATE - SLOPE, DEPTH TO ROCK 7+%: SEVERE - SLOPE
TRENCH 091	SANITARY LANDFILL (TRENCH)	SLIGHT
SANARE 101	SANITARY LANDFILL (AREA)	6-8%: SLIGHT 8-10%: MODERATE - SLOPE
COVER 111	DAILY COVER FOR LANDFILL	6-8%: FAIR - TOO CLAYEY 8-10%: FAIR - SLOPE, TOO CLAYEY

COMMUNITY DEVELOPMENT

	FOOTNOTES	
EXCAV 121	SHALLOW EXCAVATIONS	6-8%: SLIGHT 8-10%: MODERATE - SLOPE
DWEL 131	DWELLINGS WITHOUT BASEMENTS	6-8%: MODERATE - SHRINK-SWELL 8-10%: MODERATE - SLOPE, SHRINK-SWELL
DWEL 141	DWELLINGS WITH BASEMENTS	6-8%: MODERATE - SHRINK-SWELL 8-10%: MODERATE - SLOPE, SHRINK-SWELL
BLDGS 151	SMALL COMMERCIAL BUILDINGS	6-8%: MODERATE - SLOPE, SHRINK-SWELL 8+%: SEVERE - SLOPE
ROADS 161	LOCAL ROADS AND STREETS	6-8%: MODERATE - SHRINK-SWELL, LOW STRENGTH 8-10%: MODERATE - SLOPE, SHRINK-SWELL, LOW STRENGTH

REGIONAL INTERPRETATIONS

	FOOTNOTES	
REGION 171		
REGION 181		

SOURCE MATERIAL

KEYING ONLY	FOOTNOTES	
FILL 191	ROADFILL	FAIR - SHRINK-SWELL, LOW STRENGTH
SAND 201	SAND	UNSUITED
GRAVEL 211	GRAVEL	UNSUITED
SOIL 221	TOPSOIL	POOR - EXCESS ALKALI

WATER MANAGEMENT

	FOOTNOTES	
PONDRS 231	POND RESERVOIR AREA	SLOPE
DIKES 241	EMBANKMENTS DIKES AND LEVEES	UNSTABLE FILL
PONDAQ 251	EXCAVATED PONDS AQUIFER FED	NO WATER
DRAIN 261	DRAINAGE	EXCESS ALKALI, PERCS SLOWLY
IRRIG 271	IRRIGATION	EXCESS ALKALI, SLOPE, PERCS SLOWLY
TERRAC 281	TERRACES AND DIVERSIONS	--
WATERW 291	GRASSED WATERWAYS	--

KEYING ONLY — RECORD NO. / CONTROL WORD / NO.

UNIT NAME: DEBONE
UNIT MODIFIER:

RECREATION

KEYING ONLY

CONTROL WORD	NO.		FOOTNOTE
CAMPS	301	CAMP AREAS	SEVERE - DUSTY
PICNIC	311	PICNIC AREAS	SEVERE - DUSTY
PLAYGO	321	PLAYGROUNDS	SEVERE - SLOPE, DUSTY
PATHS	331	PATHS AND TRAILS	SEVERE - DUSTY

CAPABILITY AND PREDICTED YIELDS - CROPS AND PASTURE (HIGH LEVEL MANAGEMENT)

CROPHO 451 — CROPS 341

FOOTNOTE	CLASS-DETERMINING PHASE	CAPABILITY NIRR	CAPABILITY IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.
	6-10	7E	7E														

WOODLAND SUITABILITY

WOODS 361

FOOTNOTE	CLASS-DETERMINING PHASE	ORD SYM	MANAGEMENT PROBLEMS: EROSION HAZARD	EQUIP. LIMIT	SEEDLING MORT'Y.	WINDTH. HAZARD	PLANT COMPET.	POTENTIAL PRODUCTIVITY: IMPORTANT TREES	SITE INDEX	TREES TO PLANT
								NONE		

WIND BREAKS

WINDBK 381

FOOTNOTE	CLASS-DETERMINING PHASE	SPECIES	HT	SPECIES	HT	SPECIES	HT	SPECIES	HT
		NONE							

WILDLIFE HABITAT SUITABILITY

WILOLF 391

FOOTNOTE	CLASS-DETERMINING PHASE	POTENTIAL FOR HABITAT ELEMENTS: GRAIN & SEED	GRASS & LEGUME	WILD HERB.	HARDWD TREES	CONIFER PLANTS	SHRUBS	WETLAND PLANTS	SHALLOW WATER	POTENTIAL AS HABITAT FOR: OPENLAND WILDLIFE	WOODLAND WILDLIFE	WETLAND WILDLIFE	RANGELAND WILDLIFE
	ALL NIRR	V. POOR	V. POOR	POOR	--	--	POOR	V. POOR	V. POOR	V. POOR	--	V. POOR	POOR

POTENTIAL NATIVE PLANT COMMUNITY (RANGELAND OR FOREST UNDERSTORY VEGETATION)

PHASE 401 — PLANT 411

FOOTNOTE	COMMON PLANT NAME	PLANT SYMBOL (NLSPN)	PERCENTAGE COMPOSITION (DRY WEIGHT) BY CLASS DETERMINING PHASE
	THICKSPIKE WHEATGRASS	AGOA	30
	NEEDLEANDTHREAD	STCO4	20
	INDIAN RICEGRASS	ORHY	10
	BLUEBUNCH WHEATGRASS	AGSP	5
	PRAIRIE JUNEGRASS	KOCR	5
	SANDBERG BLUEGRASS	POSE	5
	BIG SAGEBRUSH	ARTR2	10
	LOW RABBITBRUSH	CHVIH2	5
	WINTERFAT	EUROT	5
		OTHER	5

POTENTIAL PRODUCTION (LBS./AC. ORY WT):

PRODUC 431

FAVORABLE YEARS	700
NORMAL YEARS	500
UNFAVORABLE YEARS	300

FOOTNOTES

NOTES 441

SYM.	
1	WATER FOR IRRIGATION NOT AVAILABLE AT PRESENT.

SCS-SOILS-5
REV. MAY 1972
FILE CODE SOILS-12

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

SOIL SURVEY INTERPRETATIONS

KEYING ONLY: RECORD NO. | CONTRDL WORD | NO.

MLRA | 001 | MLRA(S) 34 | KIND OF UNIT SERIES | UNIT NAME FORELLE

STATE | 011 | STATE WYOMING | RECORD NO. | AUTHOR(S) JRS | DATE 1/73 | REVISED | UNIT MODIFIER

CLASSIFICATION AND BRIEF SOIL DESCRIPTION

CLASS | 021 | BOROLLIC HAPLARGIDS, FINE-LOAMY, MIXED

DESCR | 031 | THE FORELLE SERIES ARE WELL DRAINED SOILS FORMED IN ALLUVIUM AND SLOPE WASH ON ALLUVIAL FANS. SLOPES ARE 0 TO 3 PERCENT. ELEVATION IS 7,000 TO 7,300 FEET. PRECIPITATION IS 10 TO 12 INCHES. MEAN ANNUAL AIR TEMPERATURE IS ABOUT 36°F., AND THE GROWING SEASON IS ABOUT 80 TO 90 DAYS. TYPICALLY, THE SURFACE LAYER IS GRAYISH BROWN TO BROWN CLAY LOAM ABOUT 4 INCHES THICK. THE SUBSOIL IS BROWN SANDY CLAY LOAM ABOUT 28 INCHES THICK. THE SUBSTRATUM IS BROWN CLAY LOAM TO 60 INCHES OR MORE.

ESTIMATED SOIL PROPERTIES

	FOOTNOTE	DEPTH (IN.)	USDA TEXTURE	UNIFIED	AASHD	FRACT. >3 IN. (PCT)	PERCENT OF MATERIAL LESS THAN 3 IN. PASSING SIEVE 4	10	40	200	LIQUID LIMIT	PLASTICITY INDEX
PRDP 041	1	0-32	SCL	SC	A-6	0-5	95-100	90-100	75-90	35-50	30-40	15-20
2		32-60	CL	CL	A-6	0	90-100	90-100	85-100	70-80	35-40	15-20
3												
4												
5												
6												

	DEPTH (IN.)	PERMEABILITY (IN/HR)	AVAILABLE WATER CAPACITY (IN/IN)	SOIL REACTION (pH)	SALINITY (MMHOS/CM)	SHRINK-SWELL POTENTIAL	CORROSIVITY STEEL	CORROSIVITY CONCRETE	EROSION FACTORS K	EROSION FACTORS T	WIND EROD. GROUP
PROP 051		.6-2.0	.14-.16	6.6-9.0	--	MODERATE	HIGH	LOW	.24	5	6
2	SAME DEPTH AS ABOVE	.6-2.0	.19-.21	7.8-9.0	--	MODERATE	HIGH	LOW	.32		
3											
4											
5											
6											

	FLOODING FREQUENCY	FLOODING DURATION	FLOODING MONTHS	HIGH WATER TABLE DEPTH (FT)	HIGH WATER TABLE KIND	HIGH WATER TABLE MONTHS	CEMENTED PAN DEPTH (IN)	CEMENTED PAN HARDNESS	BEDROCK DEPTH (IN)	BEDROCK HARDNESS	SUBSIDENCE INITIAL (IN)	SUBSIDENCE TOTAL (IN)	HYD GRP	POTENTIAL FROST ACTION
PRDP 061				>6			--		>60		--		B	LOW

SANITARY FACILITIES

	FOOTNOTES	
SEPTIC 071	1	MODERATE - PERCS SLOWLY
LAGOON 081	1	0-2%: MODERATE - PERCS RAPIDLY 2-3%: MODERATE - SLOPE, PERCS RAPIDLY
TRENCH 091	1	MODERATE - TOO CLAYEY
SANARE 101	1	SLIGHT
COVER 111		GOOD

SEPTIC: SEPTIC TANK ABSORPTION FIELDS
LAGOON: SEWAGE LAGOONS
TRENCH: SANITARY LANDFILL (TRENCH)
SANARE: SANITARY LANDFILL (AREA)
COVER: DAILY COVER FOR LANDFILL

COMMUNITY DEVELOPMENT

	FOOTNOTES	
EXCAV 121	1	MODERATE - TOO CLAYEY
DWEL 131	1	MODERATE - SHRINK-SWELL, LOW STRENGTH
DWEL 141	1	MODERATE - SHRINK-SWELL, LOW STRENGTH
BLDGS 151	1	MODERATE - SHRINK-SWELL, LOW STRENGTH
ROADS 161	1	MODERATE - LOW STRENGTH, SHRINK-SWELL

EXCAV: SHALLOW EXCAVATIONS
DWEL: DWELLINGS WITHOUT BASEMENTS
DWEL: DWELLINGS WITH BASEMENTS
BLDGS: SMALL COMMERCIAL BUILDINGS
ROADS: LOCAL ROADS AND STREETS

REGIONAL INTERPRETATIONS

REGION 171
REGION 181

SOURCE MATERIAL

KEYING ONLY		FOOTNOTES	
FILL 191	ROADFILL		FAIR TO POOR - LOW STRENGTH
SAND 201	SAND		UNSUITED
GRAVEL 211	GRAVEL		UNSUITED
SOIL 221	TOPSOIL		FAIR - TOO CLAYEY

WATER MANAGEMENT

		FOOTNOTES	
PONDRS 231	POND RESERVOIR AREA		FAVORABLE
DIKES 241	EMBANKMENTS DIKES AND LEVEES		LOW STRENGTH
PONDAQ 251	EXCAVATED PONDS AQUIFER FED		NO WATER
DRAIN 261	DRAINAGE		PERCS SLOWLY
IRRIG 271	IRRIGATION	1	FAVORABLE
TERRAC 281	TERRACES AND DIVERSIONS		--
WATERW 291	GRASSED WATERWAYS		--

UNIT NAME: FORELLE
UNIT MODIFIER:

RECREATION

KEYING ONLY RECORD NO.	CONTROL WORD	NO.		
	CAMPS	301	CAMP AREAS	FOOTNOTE 1: MODERATE - TOO CLAYEY
	PICNIC	311	PICNIC AREAS	FOOTNOTE 1: MODERATE - TOO CLAYEY
	PLAYGD	321	PLAYGROUNDS	FOOTNOTE 1: 0-2%: MODERATE - TOO CLAYEY; 2+%: MODERATE - SLOPE, TOO CLAYEY
	PATHS	331	PATHS AND TRAILS	FOOTNOTE 1: MODERATE - TOO CLAYEY

CAPABILITY AND PREDICTED YIELDS - CROPS AND PASTURE (HIGH LEVEL MANAGEMENT)

CROPHD 451 / CROPS 341	CLASS-DETERMINING PHASE	CAPABILITY NIRR	CAPABILITY IRR.														
				NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.
2	0-3	6C	3C														

WOODLAND SUITABILITY

WOODS 361 / 371	CLASS-DETERMINING PHASE	ORD SYM	MANAGEMENT PROBLEMS: EROSION HAZARD	EQUIP. LIMIT	SEEDLING MORT'Y.	WINDTH. HAZARD	PLANT COMPET.	POTENTIAL PRODUCTIVITY: IMPORTANT TREES	SITE INDEX	TREES TO PLANT
								NONE		

WIND BREAKS

WINDBK 381	CLASS-DETERMINING PHASE	SPECIES	HT	SPECIES	HT	SPECIES	HT	SPECIES	HT
		NONE							

WILDLIFE HABITAT SUITABILITY

WILDLF 391	CLASS-DETERMINING PHASE	POTENTIAL FOR HABITAT ELEMENTS: GRAIN & SEED	GRASS & LEGUME	WILD HERB.	HARDWD TREES	CONIFER PLANTS	SHRUBS	WETLAND PLANTS	SHALLOW WATER	POTENTIAL AS HABITAT FOR: OPENLAND WILDLIFE	WOODLAND WILDLIFE	WETLAND WILDLIFE	RANGELAND WILDLIFE
	ALL NIRR	POOR	POOR	FAIR	--	--	FAIR	POOR	V. POOR	POOR	--	V. POOR	FAIR

POTENTIAL NATIVE PLANT COMMUNITY (RANGELAND OR FOREST UNDERSTORY VEGETATION)

PHASE 401 / PLANT 411	COMMON PLANT NAME	PLANT SYMBOL (NLSPN)	PERCENTAGE COMPOSITION (DRY WEIGHT) BY CLASS DETERMINING PHASE
	NEEOLEANOTHREAO	STC04	15
	LETTERMAN NEEDLEGRASS	STLE4	10
	BLUEBUNCH WHEATGRASS	AGSP	10
	CANBY BLUEGRASS	POCA	10
	INDIAN RICEGRASS	ORHY	5
	THICKSPIKE WHEATGRASS	AGDA	20
	PRAIRIE JUNEGRASS	KOCR	5
	BIG SAGEBRUSH	ARTR2	15
		OTHER	10
PRODUC 431	POTENTIAL PRODUCTION (LBS./AC. DRY WT): FAVORABLE YEARS		1,500
	NORMAL YEARS		1,200
	UNFAVORABLE YEARS		700

NOTES 441

FOOTNOTES

SYM.	
1	SOILS IN LOW AREAS AND DEPRESSIONS SUBJECT TO RARE FLOODING.
2	WATER FOR IRRIGATION NOT AVAILABLE AT PRESENT.

SCS-SOILS-5
REV. MAY 1972
FILE CODE SOILS-12

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

SOIL SURVEY INTERPRETATIONS

KEYING ONLY — RECORD NO. | CONTROL WORD | NO.
MLRA | 001
STATE | 011

MLRA(S) 34 | KIND OF UNIT SERIES | UNIT NAME FRADDLE
STATE WYOMING | RECORD NO. | AUTHOR(S) JRS | DATE 2/73 | REVISED | UNIT MODIFIER

CLASSIFICATION AND BRIEF SOIL DESCRIPTION

CLASS 021: TYPIC HAPLARGIDS, FINE LOAMY, MIXED

DESCR 031: THE FRADDLE SERIES ARE WELL DRAINED SOILS FORMED IN RESIDUUM FROM SOFT SANDSTONE ON UPLANDS. SLOPES ARE 3 TO 20 PERCENT. ELEVATION IS 6,800 TO 7,000 FEET. PRECIPITATION IS 7 TO 9 INCHES, AND THE MEAN ANNUAL AIR TEMPERATURE IS ABOUT 36°F. TYPICALLY, THE SURFACE LAYER IS PALE BROWN SANDY LOAM ABOUT 4 INCHES THICK. THE SUBSOIL IS LIGHT YELLOWISH BROWN TO LIGHT OLIVE BROWN SANDY CLAY LOAM ABOUT 18 INCHES THICK. THE SUBSTRATUM IS LIGHT YELLOWISH BROWN SANDY LOAM ABOUT 11 INCHES THICK AND IS UNDERLAIN BY SOFT SANDSTONE AT A DEPTH OF 33 INCHES.

ESTIMATED SOIL PROPERTIES

FOOTNOTE

	DEPTH (IN.)	USDA TEXTURE	UNIFIED	AASHO	FRACT. >3 IN. (PCT)	PERCENT OF MATERIAL LESS THAN 3 IN. PASSING SIEVE 4	10	40	200	LIQUID LIMIT	PLASTICITY INDEX
PROP 041	0-22	SCL	SC	A-6	0	90-100	90-100	70-85	35-50	30-40	11-15
2	22-33	SL	SM-SC, SC	A-2	0	90-100	90-100	50-70	20-30	20-40	5-15
3	33	WB	--	--	--	--	--	--	--	--	--
4											
5											
6											

	DEPTH (IN.)	PERMEABILITY (IN/HR)	AVAILABLE WATER CAPACITY (IN/IN)	SOIL REACTION (pH)	SALINITY (MMHOS/CM)	SHRINK-SWELL POTENTIAL	CORROSIVITY STEEL	CORROSIVITY CONCRETE	EROSION FACTORS K	EROSION FACTORS T	WIND EROD. GROUP
PROP 051		.6-2.0	.14-.16	6.6-7.8	--	MODERATE	HIGH	LOW	.24	3	3
2	SAME DEPTH AS ABOVE	2.0-6.0	.11-.13	7.4-8.4	2.0-4.0	LOW	HIGH	LOW	.20		
3											
4											
5											
6											

	FLOODING FREQUENCY	FLOODING DURATION	FLOODING MONTHS	HIGH WATER TABLE DEPTH (FT)	HIGH WATER TABLE KIND	HIGH WATER TABLE MONTHS	CEMENTED PAN DEPTH (IN)	CEMENTED PAN HARDNESS	BEDROCK DEPTH (IN)	BEDROCK HARDNESS	SUBSIDENCE INITIAL (IN)	SUBSIDENCE TOTAL (IN)	HYD GRP	POTENTIAL FROST ACTION
PROP 061	NONE			>6			--		20-40	RIPPABLE	--		B	LOW

SANITARY FACILITIES

FOOTNOTES

SEPTIC 071	SEPTIC TANK ABSORPTION FIELDS	3-15%: SEVERE - DEPTH TO ROCK 15+%: SEVERE - SLOPE, DEPTH TO ROCK
LAGOON 081	SEWAGE LAGOONS	3-7%: SEVERE - DEPTH TO ROCK 7+%: SEVERE - SLOPE, DEPTH TO ROCK
TRENCH 091	SANITARY LANDFILL (TRENCH)	SEVERE - DEPTH TO ROCK, PERCS RAPIDLY
SANARE 101	SANITARY LANDFILL (AREA)	3-8%: SLIGHT 8-15%: MODERATE - SLOPE 15+%: SEVERE - SLOPE
COVER 111	DAILY COVER FOR LANDFILL	3-8%: FAIR - THIN LAYER 8-15%: FAIR - SLOPE, THIN LAYER 15+%: POOR - SLOPE

COMMUNITY DEVELOPMENT

FOOTNOTES

EXCAV 121	SHALLOW EXCAVATIONS	3-8%: MODERATE - DEPTH TO ROCK 8-15%: MODERATE - SLOPE, DEPTH TO ROCK 15+%: SEVERE - SLOPE
DWEL 131	DWELLINGS WITHOUT BASEMENTS	3-8%: MODERATE - SHRINK-SWELL 8-15%: MODERATE - SLOPE, SHRINK-SWELL 15+%: SEVERE - SLOPE
DWEL 141	DWELLINGS WITH BASEMENTS	3-8%: MODERATE - SHRINK-SWELL, DEPTH TO ROCK 8-15+%: MODERATE - SLOPE, SHRINK-SWELL, DEPTH TO ROCK 15+%: SEVERE - SLOPE
BLDGS 151	SMALL COMMERCIAL BUILDINGS	3-4%: MODERATE - SHRINK-SWELL 4-8%: MODERATE - SLOPE, SHRINK-SWELL 8+%: SEVERE - SLOPE
ROADS 161	LOCAL ROADS AND STREETS	3-8%: MODERATE - SHRINK-SWELL 8-15%: MODERATE - SLOPE, SHRINK-SWELL 15+%: SEVERE - SLOPE

REGIONAL INTERPRETATIONS

FOOTNOTES

REGION 171		
REGION 181		

SOURCE MATERIAL

FOOTNOTES

KEYING ONLY			
FILL	191	ROADFILL	POOR - THIN LAYER
SAND	201	SAND	UNSUITED
GRAVEL	211	GRAVEL	UNSUITED
SOIL	221	TOPSOIL	3-8%: FAIR - TOO CLAYEY 8-15%: FAIR - SLOPE, TOO CLAYEY 15+%: POOR - SLOPE

WATER MANAGEMENT

FOOTNOTES

PONDRS 231	POND RESERVOIR AREA	DEPTH TO ROCK, SLOPE, PERCS RAPIDLY
DIKES 241	EMBANKMENTS DIKES AND LEVEES	PERCS RAPIDLY, LOW STRENGTH
PONDAQ 251	EXCAVATED PONDS AQUIFER FED	NO WATER
DRAIN 261	DRAINAGE	DEPTH TO ROCK
IRRIG 271	IRRIGATION	SLOPE, ROOTING DEPTH
TERRAC 281	TERRACES AND DIVERSIONS	--
WATERW 291	GRASSED WATERWAYS	--

KEYING ONLY — RECORD NO. / CONTROL WORD / NO.

UNIT NAME: FRAGOLE
UNIT MODIFIER:

RECREATION

KEYING ONLY		FOOTNOTE		FOOTNOTE
CAMPS	301	3-8%: SLIGHT 8-15%: MODERATE - SLOPE 15+%: SEVERE - SLOPE	CAMP AREAS	
PICNIC	311	3-8%: SLIGHT 8-15%: MODERATE - SLOPE 15+%: SEVERE - SLOPE	PICNIC AREAS	
PLAYGD	321		PLAYGROUNDS	3-6%: MODERATE - SLOPE, DEPTH TO ROCK 6+%: SEVERE - SLOPE
PATHS	331		PATHS AND TRAILS	3-15%: SLIGHT 15-20%: MODERATE - SLOPE

CAPABILITY AND PREDICTED YIELDS - CROPS AND PASTURE (HIGH LEVEL MANAGEMENT)

FOOTNOTE

CROPHD 451

CROPS 341

CLASS-DETERMINING PHASE	CAPABILITY NIRR	CAPABILITY IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.
3-6%	6E	4E														
6-10%	6E	4E														
10-15%	6E	6E														
15-20%	6E	--														

351

WOODLAND SUITABILITY

FOOTNOTE

WOODS 361

CLASS-DETERMINING PHASE	ORD SYM	MANAGEMENT PROBLEMS: EROSION HAZARD	EQUIP. LIMIT	SEEDLING MORT'Y.	WINDTH. HAZARD	PLANT COMPET.	POTENTIAL PRODUCTIVITY: IMPORTANT TREES	SITE INDEX	TREES TO PLANT
							NONE		

371

WIND BREAKS

FOOTNOTE

WINDBK 381

CLASS-DETERMINING PHASE	SPECIES	HT	SPECIES	HT	SPECIES	HT	SPECIES	HT
	NONE							

WILDLIFE HABITAT SUITABILITY

FOOTNOTE

WILDLF 391

CLASS-DETERMINING PHASE	POTENTIAL FOR HABITAT ELEMENTS: GRAIN & SEED	GRASS & LEGUME	WILD HERB.	HARDWD TREES	CONIFER PLANTS	SHRUBS	WETLAND PLANTS	SHALLOW WATER	POTENTIAL AS HABITAT FOR: OPENLAND WILDLIFE	WOODLAND WILDLIFE	WETLAND WILDLIFE	RANGELAND WILDLIFE
ALL	POOR	POOR	POOR	--	--	POOR	V. POOR	V. POOR	POOR	--	V. POOR	POOR

POTENTIAL NATIVE PLANT COMMUNITY (RANGELAND OR FOREST UNDERSTORY VEGETATION)

FOOTNOTE

PHASE 401

PLANT 411

COMMON PLANT NAME	PLANT SYMBOL (NLSPN)	PERCENTAGE COMPOSITION (DRY WEIGHT) BY CLASS DETERMINING PHASE
THICKSPIKE WHEATGRASS	AGDA	30
NEEDLEANDTHREAD	STCO4	20
INDIAN RICEGRASS	ORHY	10
BIG SAGEBRUSH	ARTR2	10
BLUEBUNCH WHEATGRASS	AGSP	5
PRAIRIE JUNEGRASS	KOCR	5
SANDBERG BLUEGRASS	POSE	5
LOW RABBITBRUSH	CHVIH2	5
WINTERFAT	EUROT	5
	OTHER	5

421

POTENTIAL PRODUCTION (LBS./AC. DRY WT):	PRODUC 431
FAVORABLE YEARS	700
NORMAL YEARS	500
UNFAVORABLE YEARS	300

FOOTNOTES

NOTES 441

SYM.

WATER FOR IRRIGATION NOT AVAILABLE AT PRESENT.

SCS-SOILS-5
REV. MAY 1972
FILE CODE SOILS-12

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

SOIL SURVEY INTERPRETATIONS

KEYING ONLY — RECORD NO. | CONTROL WORD | NO.
MLRA 001
STATE 011

MLRA(S) 34 | KIND OF UNIT SERIES | UNIT NAME GLENDERSON
STATE WYOMING | RECORD NO. | AUTHOR(S) JRS | DATE 2/73 | REVISED | UNIT MODIFIER

CLASSIFICATION AND BRIEF SOIL DESCRIPTION

CLASS 021: TYPIC TORRIFLUVENTS, COARSE-LOAMY, MIXED (CALCAREOUS), FRIGID

DESCR 031: THE GLENDERSON SERIES ARE WELL DRAINED SOILS FORMED IN ALLUVIUM DERIVED LOCALLY FROM VERY STRONGLY ALKALINE INTERBEDDED SANDSTONE AND SHALE ON ALLUVIAL FANS. SLOPES ARE 0 TO 3 PERCENT. ELEVATION IS 6,800 TO 7,000 FEET. PRECIPITATION IS 7 TO 9 INCHES, AND MEAN ANNUAL AIR TEMPERATURE IS ABOUT 36°F. TYPICALLY, THE SURFACE LAYER IS LIGHT BROWNISH GRAY SANDY LOAM ABOUT 6 INCHES THICK. THE UNDERLYING LAYER IS LIGHT OLIVE GRAY TO LIGHT OLIVE BROWN SANDY LOAM STRATIFIED WITH THIN LENSES OF LOAM AND IS UNDERLAIN BY VERY FINE SANDY LOAM OR LOAM TO 60 INCHES OR MORE.

ESTIMATED SOIL PROPERTIES

	FOOTNOTE	DEPTH (IN.)	USDA TEXTURE	UNIFIED	AASHO	FRACT. >3 IN. (PCT)	PERCENT OF MATERIAL LESS THAN 3 IN. PASSING SIEVE 4	10	40	200	LIQUID LIMIT	PLASTICITY INDEX
PROP 041		0-60	SR-SL-L	SM-SC, CL	A-4	0	95-100	90-100	60-90	35-70	15-25	5-10

	DEPTH (IN.)	PERMEABILITY (IN/HR)	AVAILABLE WATER CAPACITY (IN/IN)	SOIL REACTION (PH)	SALINITY (MMHOS/CM)	SHRINK-SWELL POTENTIAL	CORROSIVITY STEEL	CORROSIVITY CONCRETE	EROSION FACTORS K	EROSION FACTORS T	WIND EROD. GROUP
PROP 051	SAME DEPTH AS ABOVE	.6-2.0	.06-.08	7.4->9.0	4.0-8.0	LOW	HIGH	MOOERATE	.24	5	3

	FLOODING FREQUENCY	FLOODING DURATION	FLOODING MONTHS	HIGH WATER TABLE DEPTH (FT)	HIGH WATER TABLE KIND	HIGH WATER TABLE MONTHS	CEMENTED PAN DEPTH (IN)	CEMENTED PAN HARDNESS	BEDROCK DEPTH (IN)	BEDROCK HARONESS	SUBSIDENCE INITIAL (IN)	SUBSIDENCE TOTAL (IN)	HYD GRP	POTENTIAL FROST ACTION
PROP 061	NONE			>6			--		>60		--		B	LOW

SANITARY FACILITIES

	FOOTNOTES		KEYING ONLY
SEPTIC 071	SEPTIC TANK ABSORPTION FIELDS	MOOERATE - PERCS SLOWLY	FILL 191
LAGOON 081	SEWAGE LAGOONS	MODERATE - PERCS RAPIDLY	SAND 201
TRENCH 091	SANITARY LANOFILL (TRENCH)	SLIGHT	GRAVEL 211
SANARE 101	SANITARY LANDFILL (AREA)	SLIGHT	SOIL 221
COVER 111	DAILY COVER FOR LANDFILL	GOOD	

COMMUNITY DEVELOPMENT

	FOOTNOTES	
EXCAV 121	SHALLOW EXCAVATIONS	SLIGHT
DWEL 131	DWELLINGS WITHOUT BASEMENTS	SLIGHT
DWEL 141	DWELLINGS WITH BASEMENTS	SLIGHT
BLDGS 151	SMALL COMMERCIAL BUILDINGS	SLIGHT
ROADS 161	LOCAL ROAOS ANO STREETS	MODERATE - LOW STRENGTH

REGIONAL INTERPRETATIONS

	FOOTNOTES	
REGION 171		
REGION 181		

SOURCE MATERIAL

	FOOTNOTES	
FILL 191	ROAOFILL	FAIR - LOW STRENGTH
SAND 201	SAND	UNSUITED
GRAVEL 211	GRAVEL	UNSUITED
SOIL 221	TOPSOIL	POOR - EXCESS ALKALI

WATER MANAGEMENT

	FOOTNOTES	
PONDRS 231	POND RESERVOIR AREA	PERCS RAPIOLY
DIKES 241	EMBANKMENTS DIKES ANO LEVEES	PERCS RAPIDLY, UNSTABLE FILL
PONDAQ 251	EXCAVATEO PONDS AQUIFER FEO	NO WATER
DRAIN 261	DRAINAGE	EXCESS ALKALI
IRRIG 271	IRRIGATION	EXCESS ALKALI, ERODES EASILY
TERRAC 281	TERRACES ANO DIVERSIONS	
WATERW 291	GRASSEO WATERWAYS	

KEYING ONLY | RECORD NO. | CONTROL WORD | NO.

UNIT NAME: GLENDERSDN
UNIT MODIFIER:

RECREATION

KEYING ONLY			FOOTNOTE		FOOTNOTE
	CAMPS	301	MODERATE - DUSTY	PLAYGD 321	D-2%: MODERATE - DUSTY 2-8%: MODERATE - SLOPE, DUSTY
		2		2	
		3	CAMP AREAS	3 PLAYGROUNDS	
		4		4	
		5		5	
	PICNIC	311	MODERATE - DUSTY	PATHS 331	MODERATE - DUSTY
		2		2	
		3	PICNIC AREAS	3 PATHS AND TRAILS	
		4		4	
		5		5	

CAPABILITY AND PREDICTED YIELDS - CROPS AND PASTURE (HIGH LEVEL MANAGEMENT)

FOOTNOTE

		CLASS-DETERMINING PHASE	CAPABILITY NIRR	CAPABILITY IRR.														
	CROPHD 451				NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.
	2																	
	3																	
	CROPS 341	0-3	7S	7S														
	2																	
	3																	
	4																	
	5																	
	6																	
	7																	
	8																	
	9																	
	351																	
	2																	
	3																	

WOODLAND SUITABILITY

FOOTNOTE

		CLASS-DETERMINING PHASE	ORD SYM	MANAGEMENT PROBLEMS: EROSION HAZARD	EQUIP. LIMIT	SEEDLING MORT'Y.	WINDTH. HAZARD	PLANT COMPET.	POTENTIAL PRODUCTIVITY: IMPORTANT TREES	SITE INDEX	TREES TO PLANT
	WOODS 361								NONE		
	2										
	3										
	4										
	5										
	6										
	7										
	8										
	9										
	371										
	2										
	3										
	4										
	5										
	6										

WIND BREAKS

FOOTNOTE

		CLASS-DETERMINING PHASE	SPECIES	HT	SPECIES	HT	SPECIES	HT	SPECIES	HT
	WINDBK 381		NONE							
	2									
	3									
	4									
	5									
	6									

WILDLIFE HABITAT SUITABILITY

FOOTNOTE

		CLASS-DETERMINING PHASE	POTENTIAL FOR HABITAT ELEMENTS: GRAIN & SEED	GRASS & LEGUME	WILD HERB.	HARDWD TREES	CONIFER PLANTS	SHRUBS	WETLAND PLANTS	SHALLOW WATER	POTENTIAL AS HABITAT FOR: OPENLAND WILDLIFE	WOODLAND WILDLIFE	WETLAND WILDLIFE	RANGELAND WILDLIFE
	WILDLF 391	ALL NIRR	V. POOR	V. POOR	POOR	--	--	POOR	POOR	V. POOR	V. POOR	--	V. POOR	POOR
	2													
	3													
	4													
	5													
	6													

POTENTIAL NATIVE PLANT COMMUNITY (RANGELAND OR FOREST UNDERSTORY VEGETATION)

FOOTNOTE

		COMMON PLANT NAME	PLANT SYMBOL (NLSPN)	PERCENTAGE COMPOSITION (DRY WEIGHT) BY CLASS DETERMINING PHASE
	PHASE 401			
	2			
	PLANT 411	THICKSPIKE WHEATGRASS	AGDA	30
	2	NEEDLEANDTHREAD	STCO4	20
	3	INDIAN RICEGRASS	ORHY	10
	4	BIG SAGEBRUSH	ARTR2	10
	5	BLUEBUNCH WHEATGRASS	AGSP	5
	6	PRAIRIE JUNEGRASS	KOCR	5
	7	SANDBERG BLUEGRASS	POSE	5
	8	LOW RABBITBRUSH	CHVIH2	5
	9	WINTERFAT	EURDT	5
	421		OTHER	5
	2			
	3			
	4			
	5			
	6			
	PRODUC 431	POTENTIAL PRODUCTION (LBS./AC. DRY WT): FAVORABLE YEARS		700
	2	NORMAL YEARS		500
	3	UNFAVORABLE YEARS		300

FOOTNOTES

		SYM.	
	NOTES 441	1	WATER FOR IRRIGATION NOT AVAILABLE AT PRESENT.
	2		
	3		
	4		
	5		
	6		
	7		

SCS-SOILS-S
REV. MAY 1972
FILE CODE SOILS-12

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

SOIL SURVEY INTERPRETATIONS

KEYING ONLY: RECORD NO. | CONTROL WORD MLRA 001, STATE 011

MLRA(S) 34 | KIND OF UNIT SERIES | UNIT NAME GLENDIVE
STATE WYOMING | RECORD NO. | AUTHOR(S) JRS | DATE 2/73 | REVISED | UNIT MODIFIER

CLASSIFICATION AND BRIEF SOIL DESCRIPTION

CLASS 021: USTIC TORRIFLUVENTS, COARSE-LOAMY, MIXED (CALCAREOUS), FRIGID

DESCR 031: THE GLENDIVE SERIES ARE WELL DRAINED SOILS FORMED IN SANDY ALLUVIUM ON FLOODPLAINS. SLOPES ARE 0 TO 3 PERCENT. ELEVATION IS 7,000 TO 7,200 FEET. PRECIPITATION IS 10 TO 12 INCHES. THE MEAN ANNUAL AIR TEMPERATURE IS ABOUT 36°F., AND THE GROWING SEASON IS ABOUT 80 TO 90 DAYS. TYPICALLY, THE PROFILE IS BROWN OR GRAYISH BROWN SANDY LOAM STRATIFIED WITH THIN LENSES OF LOAM AND VERY FINE SANDY LOAM TO 60 INCHES OR MORE.

ESTIMATED SOIL PROPERTIES

	FOOTNOTE	DEPTH (IN.)	USDA TEXTURE	UNIFIED	AASHO	FRACT. >3 IN. (PCT)	PERCENT OF MATERIAL LESS THAN 3 IN. PASSING SIEVE 4	10	40	200	LIQUID LIMIT	PLASTICITY INDEX
PROP 041		0-60	SR-SL-L	SM, CL	A-4	0	95-100	90-100	60-90	35-70	15-25	NP-10

	DEPTH (IN.)	PERMEABILITY (IN/HR)	AVAILABLE WATER CAPACITY (IN/IN)	SOIL REACTION (pH)	SALINITY (MMHOS/CM)	SHRINK-SWELL POTENTIAL	CORROSIVITY STEEL	CORROSIVITY CONCRETE	EROSION FACTORS K	EROSION FACTORS T	WIND EROD. GROUP
PROP 051	SAME DEPTH AS ABOVE	2.0-6.0	.13-.15	7.4-9.0	--	LOW	HIGH	LOW	.24	5	3

	FLOODING FREQUENCY	FLOODING DURATION	FLOODING MONTHS	HIGH WATER TABLE DEPTH (FT)	HIGH WATER TABLE KIND	HIGH WATER TABLE MONTHS	CEMENTED PAN DEPTH (IN)	CEMENTED PAN HARDNESS	BEDROCK DEPTH (IN)	BEDROCK HARDNESS	SUBSIDENCE INITIAL (IN)	SUBSIDENCE TOTAL (IN)	HYD GRP	POTENTIAL FROST ACTION
PROP 061	OCCASIONAL	VERY BRIEF	MAY-JUNE	>6			--		>60		--		B	LOW

SANITARY FACILITIES

	FOOTNOTES	
SEPTIC 071	SEPTIC TANK ABSORPTION FIELDS	SEVERE - FLOODS
LAGOON 081	SEWAGE LAGOONS	SEVERE - FLOODS
TRENCH 091	SANITARY LANDFILL (TRENCH)	SEVERE - FLOODS
SANARE 101	SANITARY LANDFILL (AREA)	SEVERE - FLOODS
COVER 111	DAILY COVER FOR LANDFILL	GOOD

COMMUNITY DEVELOPMENT

	FOOTNOTES	
EXCAV 121	SHALLOW EXCAVATIONS	SEVERE - FLOODS
DWEL 131	DWELLINGS WITHOUT BASEMENTS	SEVERE - FLOODS
DWEL 141	DWELLINGS WITH BASEMENTS	SEVERE - FLOODS
BLDGS 151	SMALL COMMERCIAL BUILDINGS	SEVERE - FLOODS
ROADS 161	LOCAL ROADS AND STREETS	SEVERE - FLOODS

REGIONAL INTERPRETATIONS

	FOOTNOTES	
REGION 171		
REGION 181		

SOURCE MATERIAL

KEYING ONLY	FOOTNOTES	
FILL 191	ROADFILL	FAIR - LOW STRENGTH
SAND 201	SAND	UNSUITED
GRAVEL 211	GRAVEL	UNSUITED
SOIL 221	TOPSOIL	GOOD

WATER MANAGEMENT

	FOOTNOTES	
PONDRS 231	POND RESERVOIR AREA	PERCS RAPIDLY
DIKES 241	EMBANKMENTS DIKES AND LEVEES	PERCS RAPIDLY, LOW STRENGTH
PONDAQ 251	EXCAVATED PONDS AQUIFER FED	DEEP TO WATER
DRAIN 261	DRAINAGE	FLOODS
IRRIG 271	IRRIGATION	FLOODS
TERRAC 281	TERRACES AND DIVERSIONS	--
WATERW 291	GRASSED WATERWAYS	---

KEYING ONLY — RECORD NO. / CONTROL WORD / NO.

UNIT NAME: GLENDIVE
UNIT MODIFIER:

RECREATION

KEYING ONLY			FOOTNOTE
CAMPS	301	CAMP AREAS	SEVERE - FLOODS
PICNIC	311	PICNIC AREAS	MODERATE - FLOODS
PLAYGD	321	PLAYGROUNDS	0-2%: MODERATE - FLOODS 2-3%: MODERATE - SLOPE, FLOODS
PATHS	331	PATHS AND TRAILS	SLIGHT

CAPABILITY AND PREDICTED YIELDS-CROPS AND PASTURE (HIGH LEVEL MANAGEMENT)

CROPHO 451

FOOTNOTE	CLASS-DETERMINING PHASE	CAPABILITY															
		NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.
CROPS 341	0-3	6E	3E														

WOODLAND SUITABILITY

FOOTNOTE	CLASS-DETERMINING PHASE	ORO SYM	MANAGEMENT PROBLEMS					POTENTIAL PRODUCTIVITY		TREES TO PLANT
			EROSION HAZARD	EQUIP. LIMIT	SEEDLING MORT'Y.	WINDTH. HAZARD	PLANT COMPET.	IMPORTANT TREES	SITE INDEX	
WOODS 361								NONE		

WIND BREAKS

WINDBK 381

FOOTNOTE	CLASS-DETERMINING PHASE	SPECIES	HT	SPECIES	HT	SPECIES	HT	SPECIES	HT
		NONE							

WILDLIFE HABITAT SUITABILITY

WILDLF 391

FOOTNOTE	CLASS-DETERMINING PHASE	POTENTIAL FOR HABITAT ELEMENTS								POTENTIAL AS HABITAT FOR:			
		GRAIN & SEED	GRASS & LEGUME	WILD HERB.	HARDWD TREES	CONIFER PLANTS	SHRUBS	WETLAND PLANTS	SHALLOW WATER	OPENLAND WILDLIFE	WOODLAND WILDLIFE	WETLAND WILDLIFE	RANGELAND WILDLIFE
	ALL	POOR	POOR	FAIR	--	--	FAIR	POOR	V. POOR	POOR	--	V. POOR	FAIR

POTENTIAL NATIVE PLANT COMMUNITY (RANGELAND OR FOREST UNDERSTORY VEGETATION)

PHASE 401

FOOTNOTE	COMMON PLANT NAME	PLANT SYMBOL (NLSPN)	PERCENTAGE COMPOSITION (DRY WEIGHT) BY CLASS DETERMINING PHASE
PLANT 411	WESTERN WHEATGRASS	AGSM	20
	BASIN WILDRYE	ELCI2	15
	CANBY BLUEGRASS	POCA	10
	NEEDLEANDTHREAD	STCO4	10
	SLENDER WHEATGRASS	AGTR	10
	PRAIRIE JUNEGRASS	KOCR	5
	BIG SAGEBRUSH	ARTR2	5
	SILVER SAGEBRUSH	ARCAI3	5
		OTHER	20

PRODUC 431

POTENTIAL PRODUCTION (LBS./AC. DRY WT):	
FAVORABLE YEARS	2,200
NORMAL YEARS	1,800
UNFAVORABLE YEARS	1,200

FOOTNOTES

NOTES 441

SYM.	
1	WATER FOR IRRIGATION NOT AVAILABLE AT PRESENT.

SCS-SOILS-5
REV. MAY 1972
FILE CODE SOILS-12

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

SOIL SURVEY INTERPRETATIONS

KEYING ONLY: RECORD NO. | CONTROL: WDRO | NO.; MLRA | 001; STATE | 011

MLRA(S): 34 | KIND OF UNIT: PHASE | UNIT NAME: GLENDIVE, SALINE

STATE: WYOMING | RECORD NO. | AUTHOR(S): JRS | DATE: 2/73 | REVISED | UNIT MODIFIER

CLASSIFICATION AND BRIEF SOIL DESCRIPTION

CLASS 021

OESCR 031

THE GLENDIVE,SALINE PHASE IS SOMEWHAT POORLY DRAINED. THE SOIL FORMED IN SANDY ALLUVIUM ON FLOODPLAINS. SLOPES ARE 0 TO 3 PERCENT. ELEVATION IS 7,000 TO 7,200 FEET. PRECIPITATION IS 10 TO 12 INCHES, THE MEAN ANNUAL AIR TEMPERATURE IS ABOUT 36°F., AND THE GROWING SEASON IS ABOUT 80 TO 90 DAYS. TYPICALLY, THE PROFILE IS BROWN OR GRAYISH BROWN,SANDY LOAM STRATIFIED WITH THIN LENSES OF LOAM AND VERY FINE SANDY LOAM TO 60 INCHES OR MORE.

ESTIMATED SOIL PROPERTIES

FOOTNOTE	OEPTH (IN.)	USOA TEXTURE	UNIFIED	AASHO	FRACT. >3 IN. (PCT)	PERCENT OF MATERIAL LESS THAN 3 IN. PASSING SIEVE 4	10	40	200	LIQUID LIMIT	PLASTICITY INDEX
PROP 041	0-60	SR- SL-L	SM, CL	A-4	0	95-100	90-100	60-90	35-70	15-25	NP-10

	OEPTH (IN.)	PERMEABILITY (IN/HR)	AVAILABLE WATER CAPACITY (IN/IN)	SOIL REACTION (pH)	SALINITY (MMHOS/CM)	SHRINK-SWELL POTENTIAL	CORROSIVITY STEEL	CORROSIVITY CONCRETE	EROSION FACTORS K	EROSION FACTORS T	WIND EROD. GROUP
PROP 051	SAME OEPTH AS ABOVE	.2-.6	.06-.07	7.4-9.0	8.0-16.0	LOW	HIGH	HIGH	.24	5	3

	FLOODING FREQUENCY	FLOODING DURATION	FLOODING MONTHS	HIGH WATER TABLE OEPTH (FT)	HIGH WATER TABLE KIND	HIGH WATER TABLE MONTHS	CEMENTED PAN OEPTH (IN)	CEMENTED PAN HARDNESS	BEDROCK OEPTH (IN)	BEDROCK HARDNESS	SUBSIDENCE INITIAL (IN)	SUBSIDENCE TOTAL (IN)	HYD GRP	POTENTIAL FROST ACTION
PROP 061	OCCASIONAL	VERY BRIEF	MAY-JUNE	1.5-3	APPARENT	MAY- OCT.	--		>60		--		B	MODERATE

SANITARY FACILITIES

FOOTNOTES		
SEPTIC 071	SEPTIC TANK ABSORPTION FIELDS	SEVERE - FLOODS, WET
LAGOON 081	SEWAGE LAGOONS	SEVERE - FLOODS, WET
TRENCH 091	SANITARY LANDFILL (TRENCH)	SEVERE - FLOODS, WET
SANARE 101	SANITARY LANDFILL (AREA)	SEVERE - FLOODS, WET
COVER 111	DAILY COVER FOR LANDFILL	GOOD

COMMUNITY DEVELOPMENT

FOOTNOTES		
EXCAV 121	SHALLOW EXCAVATIONS	SEVERE - WET, FLOODS
DWEL 131	DWELLINGS WITHOUT BASEMENTS	SEVERE - FLOODS
DWEL 141	DWELLINGS WITH BASEMENTS	SEVERE - FLOODS, WET
BLDGS 151	SMALL COMMERCIAL BUILDINGS	SEVERE - FLOODS
ROADS 161	LOCAL ROADS AND STREETS	SEVERE - FLOODS

REGIONAL INTERPRETATIONS

FOOTNOTES		
REGION 171		
REGION 181		

KEYING ONLY

SOURCE MATERIAL

FOOTNOTES		
FILL 191	ROADFILL	FAIR - AREA RECLAIM, LOW STRENGTH
SAND 201	SAND	UNSUITED
GRAVEL 211	GRAVEL	UNSUITED
SOIL 221	TOPSOIL	POOR - EXCESS SALT

WATER MANAGEMENT

FOOTNOTES		
PONDRS 231	PONO RESERVOIR AREA	PERCS RAPIDLY
DIKES 241	EMBANKMENTS DIKES AND LEVEES	UNSTABLE FILL
PONDAQ 251	EXCAVATED PONDS AQUIFER FED	FAVORABLE
DRAIN 261	DRAINAGE	FLOODS, CUTBANKS CAVE, EXCESS SALTS
IRRIG 271	IRRIGATION	FLOODS, EXCESS SALT
TERRAC 281	TERRACES AND DIVERSIONS	--
WATERW 291	GRASSED WATERWAYS	--

KEYING ONLY — RECORD NO. / CONTROL WORD / NO.

UNIT NAME: GLENOIVE
UNIT MODIFIER: SALINE

RECREATION

KEYING ONLY			FOOTNOTE
CAMPS	301	CAMP AREAS	SEVERE - WET, FLOODS
PICNIC	311	PICNIC AREAS	MODERATE - WET, FLOODS
PLAYGD	321	PLAYGROUNDS	0-2%: MODERATE - FLOODS, WET 2-3%: MODERATE - SLOPE, FLOODS, WET
PATHS	331	PATHS AND TRAILS	MODERATE - WET

CAPABILITY AND PREDICTED YIELDS - CROPS AND PASTURE (HIGH LEVEL MANAGEMENT)

FOOTNOTE

KEYING ONLY		CLASS-DETERMINING PHASE	CAPABILITY NIRR	CAPABILITY IRR.														
CROPHD	451																	
CROPS	341	0-3	6S	4S														

WOODLAND SUITABILITY

FOOTNOTE

KEYING ONLY		CLASS-DETERMINING PHASE	ORD SYM	MANAGEMENT PROBLEMS: EROSION HAZARD	EQUIP. LIMIT	SEEDLING MORT'Y.	WINDTH. HAZARD	PLANT COMPET.	POTENTIAL PRODUCTIVITY: IMPORTANT TREES	SITE INDEX	TREES TO PLANT
WOODS	361								NONE		

WIND BREAKS

FOOTNOTE

KEYING ONLY		CLASS-DETERMINING PHASE	SPECIES	HT	SPECIES	HT	SPECIES	HT	SPECIES	HT
WINDBK	381		NONE							

WILDLIFE HABITAT SUITABILITY

FOOTNOTE

KEYING ONLY		CLASS-DETERMINING PHASE	POTENTIAL FOR HABITAT ELEMENTS: GRAIN & SEED	GRASS & LEGUME	WILD HERB.	HARDWD TREES	CONIFER PLANTS	SHRUBS	WETLAND PLANTS	SHALLOW WATER	POTENTIAL AS HABITAT FOR: OPENLAND WILDLIFE	WOODLAND WILDLIFE	WETLAND WILDLIFE	RANGELAND WILDLIFE
WILDLF	391	ALL NIRR	POOR	POOR	GOOD	--	--	GOOD	FAIR	FAIR	POOR	--	FAIR	GOOD

POTENTIAL NATIVE PLANT COMMUNITY (RANGELAND OR FOREST UNDERSTORY VEGETATION)

FOOTNOTE

KEYING ONLY		COMMON PLANT NAME	PLANT SYMBOL (NLSPN)	PERCENTAGE COMPOSITION (DRY WEIGHT) BY CLASS DETERMINING PHASE
PHASE	401			
PLANT	411	ALKALI SACATON	SPAI	45
	412	BASIN WILDRYE	ELCI2	10
	413	INLAND SALTGRASS	DIST	10
	414	INLAND SEDGE	CAIN11	10
	415	GREASEWOOD	SARCO	10
	416	NUTTALL ALKALIGRASS	PUAI	5
	417	ALKALI MUHLI	MUAS	5
	418		OTHER	5

KEYING ONLY		POTENTIAL PRODUCTION (LBS./AC. DRY WT):	
PRODUC	431	FAVORABLE YEARS	3,400
	432	NORMAL YEARS	3,000
	433	UNFAVORABLE YEARS	2,500

FOOTNOTES

KEYING ONLY		SYM.	
NOTES	441	1	WATER FOR IRRIGATION NOT AVAILABLE AT PRESENT.

SCS-SOILS-5
REV. MAY 1972
FILE CODE SOILS-12

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

SOIL SURVEY INTERPRETATIONS

KEYING ONLY — RECORD NO. — CONTROL: WORD MLRA 001; STATE 011

MLRA(S) 34 | KIND OF UNIT SERIES | UNIT NAME HATERMUS
STATE WYOMING | RECORD NO. | AUTHOR(S) JRS | DATE 2/73 | REVISED | UNIT MODIFIER

CLASSIFICATION AND BRIEF SOIL DESCRIPTION

CLASS 021: TYPIC TORRIORTHENTS, LOAMY, MIXED (CALCAREOUS), FRIGID, SHALLOW

DESCR 031: THE HATERMUS SERIES ARE WELL DRAINED SOILS FORMED IN RESIDUUM FROM VERY STRONGLY ALKALINE SHALE ON RIDGES AND UPPER HILLSIDES. SLOPES ARE 10 TO 30 PERCENT. ELEVATION IS 6,800 TO 7,000 FEET. PRECIPITATION IS 7 TO 9 INCHES, MEAN ANNUAL AIR TEMPERATURE IS ABOUT 36°F., AND THE GROWING SEASON IS ABOUT 80 TO 90 DAYS. TYPICALLY, THE SURFACE LAYER IS LIGHT GRAY LOAM ABOUT 1 INCH THICK. THE UNDERLYING LAYER IS LIGHT BROWNISH GRAY CLAY LOAM TO LIGHT OLIVE GRAY LOAM ABOUT 17 INCHES THICK AND IS UNDERLAIN BY SOFT, VERY STRONGLY ALKALINE SHALE AT A DEPTH OF 18 INCHES.

ESTIMATED SOIL PROPERTIES

	FOOTNOTE	DEPTH (IN.)	USDA TEXTURE	UNIFIED	AASHO	FRACT. >3 IN. (PCT)	PERCENT OF MATERIAL LESS THAN 3 IN. PASSING SIEVE: 4	10	40	200	LIQUID LIMIT	PLASTICITY INDEX
PROP 041		0-18	CL, L	CL	A-6	0	90-100	90-100	85-100	65-80	25-35	11-15
2		18	WB	--	--	--	--	--	--			

	DEPTH (IN.)	PERMEABILITY (IN/HR)	AVAILABLE WATER CAPACITY (IN/IN)	SOIL REACTION (pH)	SALINITY (MMHOS/CM)	SHRINK-SWELL POTENTIAL	CORROSIVITY: STEEL	CORROSIVITY: CONCRETE	EROSION FACTORS: K	EROSION FACTORS: T	WIND EROD. GROUP
PROP 051		.6-2.0	.08-.09	85->9.0	2.0-4.0	MODERATE	HIGH	HIGH	.28	1	4L
2	SAME DEPTH AS ABOVE										

	FLOODING: FREQUENCY	DURATION	MONTHS	HIGH WATER TABLE: DEPTH (FT)	KIND	MONTHS	CEMENTED PAN: DEPTH (IN)	HARDNESS	BEDROCK: DEPTH (IN)	HARDNESS	SUBSIDENCE: INITIAL (IN)	TOTAL (IN)	HYD GRP	POTENTIAL FROST ACTION
PROP 061	NONE			>6			--		10-20	RIPPABLE	--		D	LOW

	FOOTNOTES	SANITARY FACILITIES	KEYING ONLY	FOOTNOTES	SOURCE MATERIAL
SEPTIC 071	SEPTIC TANK ABSORPTION FIELDS	10-15%: SEVERE - DEPTH TO ROCK 15+%: SEVERE - SLOPE, DEPTH TO ROCK	FILL 191	ROADFILL	POOR - THIN LAYER
LAGOON 081	SEWAGE LAGOONS	SEVERE - DEPTH TO ROCK, SLOPE	SAND 201	SAND	UNSUITED
TRENCH 091	SANITARY LANDFILL (TRENCH)	10-25%: SEVERE - DEPTH TO ROCK 25+%: SEVERE - SLOPE, DEPTH TO ROCK	GRAVEL 211	GRAVEL	UNSUITED
SANARE 101	SANITARY LANDFILL (AREA)	10-15%: MODERATE - SLOPE 15+%: SEVERE - SLOPE	SOIL 221	TOPSOIL	POOR - THIN LAYER, EXCESS ALKALI
COVER 111	DAILY COVER FOR LANDFILL	10-15%: POOR - THIN LAYER 15+%: POOR - SLOPE, THIN LAYER			

	FOOTNOTES	COMMUNITY DEVELOPMENT		FOOTNOTES	WATER MANAGEMENT
EXCAV 121	SHALLOW EXCAVATIONS	10-15%: SEVERE - OEPTH TO ROCK 15+%: SEVERE - SLOPE, OEPTH TO ROCK	PONDRS 231	POND RESERVOIR AREA	DEPTH TO ROCK, SLOPE
DWEL 131	DWELLINGS WITHOUT BASEMENTS	10-15%: MOOERATE - SLOPE 15+%: SEVERE - SLOPE	DIKES 241	EMBANKMENTS DIKES AND LEVEES	THIN LAYER, LOW STRENGTH
DWEL 141	DWELLINGS WITH BASEMENTS	10-15%: SEVERE - DEPTH TO ROCK 15+%: SEVERE - SLOPE, DEPTH TO ROCK	PONDAQ 251	EXCAVATED PONDS AQUIFER FED	NO WATER
BLDGS 151	SMALL COMMERCIAL BUILDINGS	SEVERE - SLOPE	DRAIN 261	DRAINAGE	DEPTH TO ROCK, EXCESS ALKALI
ROADS 161	LOCAL ROADS AND STREETS	10-15%: MODERATE - SLOPE 15+%: SEVERE - SLOPE	IRRIG 271	IRRIGATION	ROOTING DEPTH, SLOPE, EXCESS ALKALI
			TERRAC 281	TERRACES AND DIVERSIONS	--
			WATERW 291	GRASSED WATERWAYS	--

	FOOTNOTES	REGIONAL INTERPRETATIONS
REGION 171		
REGION 181		

KEYING ONLY — RECORD NO. / CONTROL WORD / NO.

UNIT NAME: HATERMUS
UNIT MODIFIER:

RECREATION

KEYING ONLY			FOOTNOTE
CAMPS	301	CAMP AREAS	10-15%: SEVERE - OUSTY 15+%: SEVERE - SLOPE, OUSTY
PICNIC	311	PICNIC AREAS	10-15%: SEVERE - OUSTY 15+%: SEVERE - ,OUSTY
PLAYGD	321	PLAYGROUNDS	SEVERE - OEPTH TO ROCK, SLOPE, OUSTY
PATHS	331	PATHS AND TRAILS	10-15%: MOOERATE - DUSTY 15-25%: MODERATE - SLOPE, OUSTY 25+%: SEVERE - SLOPE

CAPABILITY AND PREDICTED YIELDS - CROPS AND PASTURE (HIGH LEVEL MANAGEMENT)

FOOTNOTE

KEYING ONLY		CLASS-OETERMINING PHASE	CAPABILITY															
			NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.
CROPHD	451																	
CROPS	341	ALL	7E	--														

WOODLAND SUITABILITY

FOOTNOTE

KEYING ONLY		CLASS-DETERMINING PHASE	ORO SYM	MANAGEMENT PROBLEMS: EROSION HAZARO	EQUIP. LIMIT	SEEOLING MORT'Y.	WINDTH. HAZARD	PLANT COMPET.	POTENTIAL PROOUCTIVITY: IMPORTANT TREES	SITE INOEX	TREES TO PLANT
WOODS	361								NONE		

WIND BREAKS

FOOTNOTE

KEYING ONLY		CLASS-DETERMINING PHASE	SPECIES	HT	SPECIES	HT	SPECIES	HT	SPECIES	HT
WINDBK	381		NONE							

WILDLIFE HABITAT SUITABILITY

FOOTNOTE

KEYING ONLY		CLASS-DETERMINING PHASE	POTENTIAL FOR HABITAT ELEMENTS: GRAIN & SEED	GRASS & LEGUME	WILD HERB.	HARDWD TREES	CONIFER PLANTS	SHRUBS	WETLANO PLANTS	SHALLOW WATER	POTENTIAL AS HABITAT FOR: OPENLANO WILOLIFE	WOODLANO WILOLIFE	WETLANO WILOLIFE	RANGELAND WILOLIFE
WILDLF	391	ALL	V. POOR	V. POOR	POOR	--	--	POOR	V. POOR	V. POOR	V. POOR	--	V. POOR	POOR

POTENTIAL NATIVE PLANT COMMUNITY (RANGELAND OR FOREST UNDERSTORY VEGETATION)

FOOTNOTE

KEYING ONLY		COMMON PLANT NAME	PLANT SYMBOL (NLSPN)	PERCENTAGE COMPOSITION (DRY WEIGHT) BY CLASS OETERMINING PHASE
PHASE	401			
PLANT	411	BLUEBUNCH WHEATGRASS	AGSP	30
	2	THICKSPIKE WHEATGRASS	AGOA	15
	3	LETTERMAN NEEDLEGRASS	STLE4	10
	4	SANDBERG BLUEGRASS	POSE	10
	5	NEEDLEANDTHREAD	STCO4	5
	6	NEEDLELEAF SEDGE	CAEL2	5
	7	BIG SAGEBRUSH	ARTR2	5
	8	LOW RABBITBRUSH	CHVIH2	5
	9		OTHER	15
	421			
PRODUC	431	POTENTIAL PRODUCTION (LBS./AC. DRY WT): FAVORABLE YEARS		450
	2	NORMAL YEARS		350
	3	UNFAVORABLE YEARS		200

FOOTNOTES

KEYING ONLY		SYM.
NOTES	441	

SCS-SOILS-5
REV. MAY 1972
FILE CODE SOILS-12

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

SOIL SURVEY INTERPRETATIONS

KEYING ONLY — RECORD NO. | CONTROL: WORD NO.

MLRA 001 | STATE 011

MLRA(S): 34 | KIND OF UNIT: SERIES | UNIT NAME: HATERTON

STATE: WYOMING | RECORD NO.: | AUTHOR(S): JRS | DATE: 2/73 | REVISED: | UNIT MODIFIER:

CLASSIFICATION AND BRIEF SOIL DESCRIPTION

CLASS 021: TYPIC TORRIORTHENTS, LOAMY, MIXED (CALCAREOUS), FRIGID, SHALLOW.

DESCR 031: THE HATERTON SERIES ARE WELL DRAINED SOILS FORMED IN RESIDUUM FROM SILTSTONE OR SHALE ON RIDGES AND UPPER SIDEHILLS. SLOPES ARE 10 TO 30 PERCENT. PRECIPITATION IS 7 TO 9 INCHES, MEAN ANNUAL AIR TEMPERATURE IS ABOUT 36°F., AND THE GROWING SEASON IS 80 TO 90 DAYS. TYPICALLY, THE SURFACE LAYER IS LIGHT BROWNISH GRAY FINE SANDY LOAM ABOUT 2 INCHES THICK. THE UNDERLYING LAYER IS PALE BROWN LOAM ABOUT 16 INCHES THICK AND IS UNDERLAIN BY SOFT SHALE AT A DEPTH OF 18 INCHES.

ESTIMATED SOIL PROPERTIES

FOOTNOTE	DEPTH (IN.)	USDA TEXTURE	UNIFIED	AASHO	FRACT. >3 IN. (PCT)	PERCENT OF MATERIAL LESS THAN 3 IN. PASSING SIEVE: 4	10	40	200	LIQUID LIMIT	PLASTICITY INDEX
PROP 041	0-18	L	ML-CL, CL	A-4, A-6	0	80-95	75-90	65-85	50-70	20-35	5-10
	18+	WB									

	DEPTH (IN.)	PERMEABILITY (IN/HR)	AVAILABLE WATER CAPACITY (IN/IN)	SOIL REACTION (pH)	SALINITY (MMHOS/CM)	SHRINK-SWELL POTENTIAL	CORROSIVITY: STEEL	CORROSIVITY: CONCRETE	EROSION FACTORS: K	EROSION FACTORS: T	WIND EROD. GROUP
PROP 051	SAME DEPTH AS ABOVE	.6-2.0	.16-.18	7.8-9.0	2.0-4.0	LOW	HIGH	MODERATE	.28	1	3

	FLOODING: FREQUENCY	FLOODING: DURATION	FLOODING: MONTHS	HIGH WATER TABLE: DEPTH (FT)	HIGH WATER TABLE: KIND	HIGH WATER TABLE: MONTHS	CEMENTED PAN: DEPTH (IN)	CEMENTED PAN: HARDNESS	BEDROCK: DEPTH (IN)	BEDROCK: HARDNESS	SUBSIDENCE: INITIAL (IN)	SUBSIDENCE: TOTAL (IN)	HYD GRP	POTENTIAL FROST ACTION
PROP 061	NONE			>6			--		10-20	RIPPABLE	--		D	LOW

SANITARY FACILITIES

	FOOTNOTES	
SEPTIC 071	SEPTIC TANK ABSORPTION FIELDS	10-15%: SEVERE - DEPTH TO ROCK 15+%: SEVERE - SLOPE, DEPTH TO ROCK
LAGOON 081	SEWAGE LAGOONS	SEVERE - DEPTH TO ROCK, SLOPE
TRENCH 091	SANITARY LANDFILL (TRENCH)	10-25%: SEVERE - DEPTH TO ROCK 25+%: SEVERE - SLOPE, DEPTH TO ROCK
SANARE 101	SANITARY LANDFILL (AREA)	10-15%: MODERATE - SLOPE 15+%: SEVERE - SLOPE
COVER 111	DAILY COVER FOR LANDFILL	10-15%: POOR - THIN LAYER 15+%: POOR - SLOPE, THIN LAYER

COMMUNITY DEVELOPMENT

	FOOTNOTES	
EXCAV 121	SHALLOW EXCAVATIONS	10-15%: SEVERE - DEPTH TO ROCK 15+%: SEVERE - SLOPE, DEPTH TO ROCK
DWEL 131	DWELLINGS WITHOUT BASEMENTS	10-15%: MODERATE - SLOPE 15+%: SEVERE - SLOPE
DWEL 141	DWELLINGS WITH BASEMENTS	10-15%: SEVERE - DEPTH TO ROCK 15+%: SEVERE - SLOPE, DEPTH TO ROCK
BLDGS 151	SMALL COMMERCIAL BUILDINGS	SEVERE - SLOPE
ROADS 161	LOCAL ROADS AND STREETS	10-15%: MODERATE - SLOPE 15+%: SEVERE - SLOPE

REGIONAL INTERPRETATIONS

	FOOTNOTES	
REGION 171		
REGION 181		

SOURCE MATERIAL

KEYING ONLY	FOOTNOTES	
FILL 191	ROADFILL	POOR - THIN LAYER
SAND 201	SAND	UNSUITED
GRAVEL 211	GRAVEL	UNSUITED
SOIL 221	TOPSOIL	POOR - THIN LAYER

WATER MANAGEMENT

	FOOTNOTES	
PONDRS 231	POND RESERVOIR AREA	DEPTH TO ROCK, SLOPE
DIKES 241	EMBANKMENTS DIKES AND LEVEES	THIN LAYER, LOW STRENGTH
PONDAQ 251	EXCAVATED PONDS AQUIFER FED	NO WATER
DRAIN 261	DRAINAGE	DEPTH TO ROCK
IRRIG 271	IRRIGATION	ROOTING DEPTH, SLOPE
TERRAC 281	TERRACES AND DIVERSIONS	
WATERW 291	GRASSED WATERWAYS	

UNIT NAME: HATERTON
UNIT MODIFIER:

RECREATION

KEYING ONLY RECORD NO.	CONTROL WORD	NO.	FOOTNOTE	KEYING ONLY	NO.	FOOTNOTE
	CAMPS	301	10-15%: MODERATE - SLOPE 15+%: SEVERE - SLOPE (CAMP AREAS)	PLAYGD	321	SEVERE - DEPTH TO ROCK, SLOPE (PLAYGROUNDS)
	PICNIC	311	10-15%: MODERATE - SLOPE 15+%: SEVERE - SLOPE (PICNIC AREAS)	PATHS	331	10-15%: SLIGHT 15-25%: MODERATE - SLOPE 25+%: SEVERE - SLOPE (PATHS AND TRAILS)

CAPABILITY AND PREDICTED YIELDS - CROPS AND PASTURE (HIGH LEVEL MANAGEMENT)

	CROPHD 451	CROPS 341	FOOTNOTE	CLASS-DETERMINING PHASE	CAPABILITY NIRR	CAPABILITY IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.
				ALL	7E	--														

WOODLAND SUITABILITY

WOODS 361	FOOTNOTE	CLASS-DETERMINING PHASE	ORD SYM	MANAGEMENT PROBLEMS: EROSION HAZARD	EQUIP. LIMIT	SEEDLING MORT'Y.	WINDTH. HAZARD	PLANT COMPET.	POTENTIAL PRODUCTIVITY: IMPORTANT TREES	SITE INDEX	TREES TO PLANT
									NONE		

WIND BREAKS

WINOBK 381	FOOTNOTE	CLASS-DETERMINING PHASE	SPECIES	HT	SPECIES	HT	SPECIES	HT	SPECIES	HT
			NONE							

WILDLIFE HABITAT SUITABILITY

WILOLF 391	FOOTNOTE	CLASS-DETERMINING PHASE	POTENTIAL FOR HABITAT ELEMENTS: GRAIN & SEED	GRASS & LEGUME	WILD HERB.	HARDWD TREES	CONIFER PLANTS	SHRUBS	WETLAND PLANTS	SHALLOW WATER	POTENTIAL AS HABITAT FOR: OPENLAND WILDLIFE	WOODLAND WILDLIFE	WETLAND WILDLIFE	RANGELAND WILDLIFE
		ALL	V. POOR	V. POOR	POOR	--	--	POOR	V. POOR	V. POOR	V. POOR	--	V. POOR	POOR

POTENTIAL NATIVE PLANT COMMUNITY (RANGELAND OR FOREST UNDERSTORY VEGETATION)

PHASE 401	PLANT 411	FOOTNOTE	COMMON PLANT NAME	PLANT SYMBOL (NLSPN)	PERCENTAGE COMPOSITION (DRY WEIGHT) BY CLASS DETERMINING PHASE
	1		BLUEBUNCH WHEATGRASS	AGSP	30
	2		THICKSPIKE WHEATGRASS	AGDA	15
	3		LETTERMAN NEEDLEGRASS	STLE4	10
	4		SANDBERG BLUEGRASS	POSE	10
	5		NEEDLEANDTHREAD	STCO4	5
	6		NEEDLELEAF SEDGE	CAEL2	5
	7		BIG SAGEBRUSH	ARTR2	5
	8		LOW RABBITBRUSH	CHVIH2	5
	9			OTHER	15

PRODUC 431	POTENTIAL PRODUCTION (LBS./AC. DRY WT):	
1	FAVORABLE YEARS	450
2	NORMAL YEARS	350
3	UNFAVORABLE YEARS	200

NOTES 441	SYM.	FOOTNOTES

SCS-SOILS-5
REV. MAY 1972
FILE CODE SOILS-12

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

SOIL SURVEY INTERPRETATIONS

KEYING ONLY — RECORD NO. | CONTROL WORD | NO.

MLRA(S) 34 | KIND OF UNIT SERIES | UNIT NAME HAVRE
STATE WYOMING | RECORD NO. | AUTHOR(S) JRS | DATE 2/73 | REVISED | UNIT MODIFIER

CLASSIFICATION AND BRIEF SOIL DESCRIPTION

CLASS 021: USTIC TORRIFLUVENTS, FINE-LOAMY, MIXED (CALCAREOUS), FRIGID

DESCR 031: THE HAVRE SERIES ARE WELL DRAINED SOILS FORMED IN ALLUVIUM ON FLOODPLAINS. SLOPES ARE 0 TO 3 PERCENT. ELEVATION IS 7,000 TO 7,300 FEET. PRECIPITATION IS 10 TO 12 INCHES, MEAN ANNUAL AIR TEMPERATURE IS ABOUT 36°F., AND THE GROWING SEASON IS 80 TO 90 DAYS. TYPICALLY, THE SURFACE LAYER IS BROWN LOAM ABOUT 4 INCHES THICK. THE UNDERLYING LAYER IS GRAYISH BROWN TO BROWN STRATIFIED LOAM TO CLAY LOAM TO 60 INCHES OR MORE.

ESTIMATED SOIL PROPERTIES

	FOOTNOTE	DEPTH (IN.)	USDA TEXTURE	UNIFIED	AASHO	FRACT. >3 IN. (PCT)	PERCENT OF MATERIAL LESS THAN 3 IN. PASSING SIEVE 4	10	40	200	LIQUID LIMIT	PLASTICITY INDEX
PROP 041		0-60	SR-L-CL	CL	A-6	0	100	90-100	80-100	60-80	25-35	11-15

	DEPTH (IN.)	PERMEABILITY (IN/HR)	AVAILABLE WATER CAPACITY (IN/IN)	SOIL REACTION (pH)	SALINITY (MMHOS/CM)	SHRINK-SWELL POTENTIAL	CORROSIVITY STEEL	CORROSIVITY CONCRETE	EROSION FACTORS K	EROSION FACTORS T	WIND EROD. GROUP
PROP 051	SAME DEPTH AS ABOVE	.6-2.0	.16-.18	7.4-9.0	2.0-4.0	MODERATE	HIGH	LOW	.28	5	4L

	FLOODING FREQUENCY	FLOODING DURATION	FLOODING MONTHS	HIGH WATER TABLE DEPTH (FT)	HIGH WATER TABLE KIND	HIGH WATER TABLE MONTHS	CEMENTED PAN DEPTH (IN)	CEMENTED PAN HARDNESS	BEDROCK DEPTH (IN)	BEDROCK HARDNESS	SUBSIDENCE INITIAL (IN)	SUBSIDENCE TOTAL (IN)	HYD GRP	POTENTIAL FROST ACTION
PROP 061	OCCASIONAL	VERY BRIEF	MAY-JUNE	>6					>60		--		B	LOW

	FOOTNOTES	SANITARY FACILITIES	KEYING ONLY	FOOTNOTES	SOURCE MATERIAL
SEPTIC 071	SEPTIC TANK ABSORPTION FIELDS	SEVERE - FLOODS	FILL 191	ROADFILL	FAIR - SHRINK-SWELL, LOW STRENGTH
LAGOON 081	SEWAGE LAGOONS	SEVERE - FLOODS	SAND 201	SAND	UNSUITED
TRENCH 091	SANITARY LANDFILL (TRENCH)	SEVERE - FLOODS	GRAVEL 211	GRAVEL	UNSUITED
SANARE 101	SANITARY LANDFILL (AREA)	SEVERE - FLOODS	SOIL 221	TOPSOIL	GOOD
COVER 111	DAILY COVER FOR LANDFILL	GOOD			

	FOOTNOTES	COMMUNITY DEVELOPMENT		FOOTNOTES	WATER MANAGEMENT
EXCAV 121	SHALLOW EXCAVATIONS	SEVERE - FLOODS	PONDRS 231	PONO RESERVOIR AREA	FAVORABLE
DWEL 131	DWELLINGS WITHOUT BASEMENTS	SEVERE - FLOODS	DIKES 241	EMBANKMENTS DIKES AND LEVEES	LOW STRENGTH, SHRINK-SWELL
DWEL 141	DWELLINGS WITH BASEMENTS	SEVERE - FLOODS	PONDAQ 251	EXCAVATED PONDS AQUIFER FED	DEEP TO WATER
BLDGS 151	SMALL COMMERCIAL BUILDINGS	SEVERE - FLOODS	DRAIN 261	DRAINAGE	FLOODS
ROADS 161	LOCAL ROADS AND STREETS	SEVERE - FLOODS	IRRIG 271	IRRIGATION	FLOODS
			TERRAC 281	TERRACES AND DIVERSIONS	--
			WATERW 291	GRASSED WATERWAYS	--

	FOOTNOTES	REGIONAL INTERPRETATIONS
REGION 171		
REGION 181		

UNIT NAME: HAVRE
UNIT MODIFIER:

RECREATION

KEYING ONLY RECORD NO.	CONTROL WORD	NO.		FOOTNOTE
	CAMPS	301	CAMP AREAS	SEVERE - FLOODS
	PICNIC	311	PICNIC AREAS	MODERATE - FLOODS

KEYING ONLY			FOOTNOTE
PLAYGO	321	PLAYGROUNDS	0-2%: MODERATE - FLOODS 3+%: MODERATE - SLOPE, FLOODS
PATHS	331	PATHS AND TRAILS	SLIGHT

CAPABILITY AND PREDICTED YIELDS - CROPS AND PASTURE (HIGH LEVEL MANAGEMENT)

FOOTNOTE

CROPHO	CROPS	CLASS-DETERMINING PHASE	CAPABILITY NIRR	CAPABILITY IRR.														
451	341	0-3	6E	3C														

WOODLAND SUITABILITY

FOOTNOTE

WOODS	CLASS-DETERMINING PHASE	ORD SYM	MANAGEMENT PROBLEMS: EROSION HAZARD	EQUIP. LIMIT	SEEDLING MORT'Y.	WINDTH. HAZARD	PLANT COMPET.	POTENTIAL PRODUCTIVITY: IMPORTANT TREES	SITE INDEX	TREES TO PLANT
361								NONE		

WIND BREAKS

FOOTNOTE

WINDBK	CLASS-DETERMINING PHASE	SPECIES	HT	SPECIES	HT	SPECIES	HT	SPECIES	HT
381		NONE							

WILDLIFE HABITAT SUITABILITY

FOOTNOTE

WILDLF	CLASS-DETERMINING PHASE	POTENTIAL FOR HABITAT ELEMENTS: GRAIN & SEED	GRASS & LEGUME	WILD HERB.	HAROWD TREES	CONIFER PLANTS	SHRUBS	WETLAND PLANTS	SHALLOW WATER	POTENTIAL AS HABITAT FOR: OPENLAND WILDLIFE	WOODLAND WILDLIFE	WETLAND WILDLIFE	RANGELAND WILDLIFE
391	ALL NIRR	POOR	POOR	FAIR	--	--	FAIR	POOR	V. POOR	POOR	--	V. POOR	FAIR

POTENTIAL NATIVE PLANT COMMUNITY (RANGELAND OR FOREST UNDERSTORY VEGETATION)

FOOTNOTE

PHASE	PLANT	COMMON PLANT NAME	PLANT SYMBOL (NLSPN)	PERCENTAGE COMPOSITION (DRY WEIGHT) BY CLASS DETERMINING PHASE
401				
	411	WESTERN WHEATGRASS	AGSM	20
		BASIN WILDRYE	ELCI2	15
		CANBY BLUEGRASS	POCA	10
		NEEOLEANOTHREAO	STCO4	10
		SLENDER WHEATGRASS	AGTR	10
		PRAIRIE JUNEGRASS	KOCR	5
		BIG SAGEBRUSH	ARTR2	5
		SILVER SAGEBRUSH	ARCAI3	5
			OTHER	20

PRODUC	POTENTIAL PRODUCTION (LBS./AC. DRY WT):	
431	FAVORABLE YEARS	2,200
	NORMAL YEARS	1,800
	UNFAVORABLE YEARS	1,200

FOOTNOTES

NOTES	SYM.	
441	1	WATER FOR IRRIGATION NOT AVAILABLE AT PRESENT.

SCS-SOILS-S
REV. MAY 1972
FILE CODE SOILS-12

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

SOIL SURVEY INTERPRETATIONS

KEYING ONLY — RECORD NO. | CONTROL: WORO 001; MLRA; STATE 011

MLRA(S) 34 | KIND OF UNIT PHASE | UNIT NAME HAVRE
STATE WYOMING | RECORD NO. | AUTHOR(S) JRS | DATE 2/73 | REVISED | UNIT MODIFIER SALINE

CLASSIFICATION AND BRIEF SOIL DESCRIPTION

CLASS 021

DESCR 031: THE HAVRE SALINE PHASE IS SOMEWHAT POORLY DRAINED. THE SOIL FORMED IN ALLUVIUM ON FLOODPLAINS. SLOPES ARE 0 TO 3 PERCENT. ELEVATION IS 7,000 TO 7,300 FEET. PRECIPITATION IS 10 TO 12 INCHES, MEAN ANNUAL AIR TEMPERATURE IS ABOUT 36°F., AND THE GROWING SEASON IS 80 TO 90 DAYS. TYPICALLY, THE SURFACE LAYER IS BROWN LOAM ABOUT 4 INCHES THICK. THE UNDERLYING LAYER IS GRAYISH BROWN TO BROWN STRATIFIED LOAM TO CLAY LOAM TO 60 INCHES OR MORE.

ESTIMATED SOIL PROPERTIES

	FOOTNOTE	DEPTH (IN.)	USDA TEXTURE	UNIFIED	AASHO	FRACT. >3 IN. (PCT)	PERCENT OF MATERIAL LESS THAN 3 IN. PASSING SIEVE 4	10	40	200	LIQUID LIMIT	PLASTICITY INDEX
PROP 041		0-60	SR- L- CL	CL	A-6	0	100	90-100	80-100	60-80	25-35	11-15

	DEPTH (IN.)	PERMEABILITY (IN/HR)	AVAILABLE WATER CAPACITY (IN/IN)	SOIL REACTION (pH)	SALINITY (MMHOS/CM)	SHRINK-SWELL POTENTIAL	CORROSIVITY STEEL	CORROSIVITY CONCRETE	EROSION FACTORS K	EROSION FACTORS T	WIND EROD. GROUP
PROP 051	SAME DEPTH AS ABOVE	.20-.6	.08-.09	7.9-9.0	8.0-16.0	MODERATE	HIGH	MODERATE	.28	5	4L

	FLOOOING FREQUENCY	FLOOOING DURATION	FLOOOING MONTHS	HIGH WATER TABLE DEPTH (FT)	HIGH WATER TABLE KIND	HIGH WATER TABLE MONTHS	CEMENTED PAN DEPTH (IN)	CEMENTED PAN HARDNESS	BEDROCK DEPTH (IN)	BEDROCK HARDNESS	SUBSIDENCE INITIAL (IN)	SUBSIDENCE TOTAL (IN)	HYD GRP	POTENTIAL FROST ACTION
PROP 061	OCCASIONAL	VERY BRIEF	MAY-JUNE	1.5-3	APPARENT	MAY-OCT.	--		>60				B	LOW

SANITARY FACILITIES

	FOOTNOTES	SANITARY FACILITIES	KEYING ONLY
SEPTIC 071	SEPTIC TANK ABSORPTION FIELDS	SEVERE - FLOODS, WET	FILL 191
LAGOON 081	SEWAGE LAGOONS	SEVERE - FLOODS, WET	SAND 201
TRENCH 091	SANITARY LANDFILL (TRENCH)	SEVERE - FLOODS, WET	GRAVEL 211
SANARE 101	SANITARY LANDFILL (AREA)	SEVERE - FLOODS, WET	SOIL 221
COVER 111	DAILY COVER FOR LANDFILL	GOOD	

COMMUNITY DEVELOPMENT

	FOOTNOTES	COMMUNITY DEVELOPMENT
EXCAV 121	SHALLOW EXCAVATIONS	SEVERE - FLOODS, WET
DWEL 131	DWELLINGS WITHOUT BASEMENTS	SEVERE - FLOODS
DWEL 141	DWELLINGS WITH BASEMENTS	SEVERE - WET, FLOODS
BLDGS 151	SMALL COMMERCIAL BUILDINGS	SEVERE - FLOODS
ROADS 161	LOCAL ROADS AND STREETS	SEVERE - FLOODS

REGIONAL INTERPRETATIONS

	FOOTNOTES	REGIONAL INTERPRETATIONS
REGION 171		
REGION 181		

SOURCE MATERIAL

	FOOTNOTES	SOURCE MATERIAL
FILL 191	ROADFILL	FAIR - AREA RECLAIM, SHRINK-SWELL, LOW STRENGTH
SAND 201	SAND	UNSUITED
GRAVEL 211	GRAVEL	UNSUITED
SOIL 221	TOPSOIL	POOR - EXCESS SALT

WATER MANAGEMENT

	FOOTNOTES	WATER MANAGEMENT
PONDRS 231	POND RESERVOIR AREA	FAVORABLE
DIKES 241	EMBANKMENTS DIKES AND LEVEES	UNSTABLE FILL
PONDAQ 251	EXCAVATED PONDS AQUIFER FED	FAVORABLE
DRAIN 261	DRAINAGE	FLOODS, EXCESS SALT
IRRIG 271	IRRIGATION	FLOODS - EXCESS SALT
TERRAC 281	TERRACES AND DIVERSIONS	--
WATERW 291	GRASSED WATERWAYS	--

KEYING ONLY — RECORD NO. / CONTRDL WORD / CONTRDL NO.

UNIT NAME: HAVRE
UNIT MODIFIER: SALINE

RECREATION

KEYING ONLY	CONTRDL NO.		FOOTNOTE		FOOTNOTE
CAMPS	301	CAMP AREAS	SEVERE - WET, FLOODS	PLAYGD 321	PLAYGRDUNDS	0-2%: MODERATE - FLOODS, WET 2-3%: MODERATE - SLOPE, FLOODS, WET
PICNIC	311	PICNIC AREAS	SEVERE - WET, FLOODS	PATHS 331	PATHS AND TRAILS	MODERATE - WET

CAPABILITY AND PREDICTED YIELDS-CROPS AND PASTURE (HIGH LEVEL MANAGEMENT)

CROPHD 451 / CROPS 341

FOOTNDTE	CLASS-DETERMINING PHASE	CAPABILITY NIRR	CAPABILITY IRR.														
		NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.
1	0-3	6S	4S														

WOODLAND SUITABILITY

FODTNDTE / WOODS 361

CLASS-DETERMINING PHASE	DRD SYM	MANAGEMENT PRDBLEMS: EROSION HAZARD	EQUIP. LIMIT	SEEDLING MDRT'Y.	WINDTH. HAZARD	PLANT COMPET.	POTENTIAL PRDDUCTIVITY: IMPORTANT TREES	SITE INDEX	TREES TO PLANT
							NONE		

WIND BREAKS

FOOTNOTE / WINDBK 381

CLASS-DETERMINING PHASE	SPECIES	HT	SPECIES	HT	SPECIES	HT	SPECIES	HT
	NONE							

WILDLIFE HABITAT SUITABILITY

FODTNOTE / WILDLF 391

CLASS-DETERMINING PHASE	POTENTIAL FOR HABITAT ELEMENTS: GRAIN & SEED	GRASS & LEGUME	WILD HERB.	HARDWD TREES	CONIFER PLANTS	SHRUBS	WETLAND PLANTS	SHALLDW WATER	POTENTIAL AS HABITAT FOR: OPENLAND WILDLIFE	WOODLAND WILDLIFE	WETLAND WILDLIFE	RANGELAND WILDLIFE
ALL NIRR	POOR	POOR	GOOD	--	--	GOOD	FAIR	FAIR	POOR	--	FAIR	GOOD

POTENTIAL NATIVE PLANT COMMUNITY (RANGELAND OR FOREST UNDERSTORY VEGETATION)

FOOTNOTE / PHASE 401 / PLANT 411

COMMON PLANT NAME	PLANT SYMBOL (NLSPN)	PERCENTAGE COMPOSITION (DRY WEIGHT) BY CLASS DETERMINING PHASE
ALKALI SACATON	SPAI	45
BASIN WILDRYE	ELCI2	10
INLAND SALTGRASS	DIST	10
INLAND SEDGE	CAIN11	10
GREASEWOOD	SARCO	10
ALKALI MUHLY	MUAS	5
NUTTALL ALKALIGRASS	PUAI	5
OTHER	--	5

PRODUC 431

POTENTIAL PRODUCTION (LBS./AC. DRY WT):	PERCENTAGE COMPOSITION (DRY WEIGHT) BY CLASS DETERMINING PHASE
FAVORABLE YEARS	3,400
NORMAL YEARS	3,000
UNFAVORABLE YEARS	2,500

NOTES 441

SYM.	FOOTNOTES
1	WATER FOR IRRIGATION NOT AVAILABLE AT PRESENT.

SCS-SOILS-S
REV. MAY 1972
FILE CODE SOILS-12

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

SOIL SURVEY INTERPRETATIONS

KEYING ONLY

RECORD NO.	CONTRDL WORD	NO.
	MLRA	001
	STATE	011

MLRA(S) 34 | KIND OF UNIT SERIES | UNIT NAME HUGUSTON

STATE WYDMING | RECORD NO. | AUTHOR(S) JRS | DATE 1/73 | REVISED | UNIT MODIFIER

CLASSIFICATION AND BRIEF SOIL DESCRIPTION

CLASS 021: TYPIC TORRIORTHENTS, LDAMY, MIXED (CALCAREOUS), FRIGID, SHALLOW

DESCR 031: THE HUGUSTON SERIES ARE WELL DRAINED SOILS FORMED IN RESIDUUM FROM SANDSTONE ON RIDGES AND UPPER HILLSIDES. SLOPES ARE 10 TO 30 PERCENT. ELEVATION IS 6,800 TO 7,000 FEET. PRECIPITATION IS 7 TO 9 INCHES, MEAN ANNUAL AIR TEMPERATURE IS ABOUT 36°F., AND THE GRDWING SEASON IS ABOUT 80 TO 90 DAYS. TYPICALLY, THE SURFACE LAYER IS GRAYISH BROWN SANDY LOAM ABOUT 2 INCHES THICK. THE UNDERLYING LAYER IS LIGHT OLIVE BROWN SANDY LOAM ABOUT 12 INCHES THICK AND IS UNDERLAIN BY SOFT SANDSTONE AT A DEPTH OF 14 INCHES.

ESTIMATED SOIL PROPERTIES

	FOOTNOTE	DEPTH (IN.)	USDA TEXTURE	UNIFIED	AASHO	FRACT. >3 IN. (PCT)	PERCENT OF MATERIAL LESS THAN 3 IN. PASSING SIEVE 4	10	40	200	LIQUID LIMIT	PLASTICITY INDEX
PRDP 041	1	0-14	SL	SM, SM-SC	A-1, A-2	0	70-80	60-75	35-50	20-30	10-15	NP-5
	2	14+	WB									

	DEPTH (IN.)	PERMEABILITY (IN/HR)	AVAILABLE WATER CAPACITY (IN/IN)	SOIL REACTION (pH)	SALINITY (MMHOS/CM)	SHRINK-SWELL POTENTIAL	CORROSIVITY STEEL	CORROSIVITY CONCRETE	EROSION FACTORS K	EROSION FACTORS T	WIND EROD. GROUP
PROP 051	SAME DEPTH AS ABOVE	2.0-6.0	.11-.13	7.9-9.0	2.0-4.0	LOW	HIGH	LOW	.20	1	3

	FLOODING FREQUENCY	FLOODING DURATION	FLOODING MONTHS	HIGH WATER TABLE DEPTH (FT)	HIGH WATER TABLE KIND	HIGH WATER TABLE MONTHS	CEMENTED PAN DEPTH (IN)	CEMENTED PAN HARDNESS	BEDROCK DEPTH (IN)	BEDROCK HARDNESS	SUBSIDENCE INITIAL (IN)	SUBSIDENCE TOTAL (IN)	HYD GRP	POTENTIAL FRDST ACTION
PRDP 061	NONE			NONE			--		10-20	RIPPABLE	--	--	D	LOW

SANITARY FACILITIES

	FOOTNOTES	SANITARY FACILITIES
SEPTIC 071	SEPTIC TANK ABSORPTION FIELDS	10-15%: SEVERE - DEPTH TO ROCK 15+%: SEVERE - SLOPE, DEPTH TO ROCK
LAGOON 081	SEWAGE LAGOONS	SEVERE - DEPTH TO ROCK, SLOPE, PERCS RAPIDLY
TRENCH 091	SANITARY LANDFILL (TRENCH)	10-25%: SEVERE - DEPTH TO ROCK, PERCS RAPIOLY 25+%: SEVERE - SLOPE, DEPTH TO RDCK, PERCS RAPIDLY
SANARE 101	SANITARY LANOFILL (AREA)	10-15%: SEVERE - PERCS RAPIDLY 15+%: SEVERE - SLOPE, PERCS RAPIDLY
COVER 111	DAILY COVER FOR LANDFILL	10-15%: POOR - THIN LAYER 15+%: POOR - SLOPE, THIN LAYER

COMMUNITY DEVELOPMENT

	FOOTNOTES	COMMUNITY DEVELOPMENT
EXCAV 121	SHALLDW EXCAVATIONS	10-15%: SEVERE - DEPTH TO ROCK 15+%: SEVERE - SLOPE, DEPTH TO ROCK
DWEL 131	DWELLINGS WITHOUT BASEMENTS	10-15%: MOOERATE - SLOPE, DEPTH TO ROCK 15+%: SEVERE - SLOPE
DWEL 141	DWELLINGS WITH BASEMENTS	10-15%: SEVERE - DEPTH TO ROCK 15+%: SEVERE - SLOPE, DEPTH TO ROCK
BLDGS 151	SMALL COMMERCIAL BUILDINGS	SEVERE - SLOPE
ROADS 161	LOCAL ROADS ANO STREETS	10-15%: MODERATE - SLOPE, DEPTH TO ROCK 15+%: SEVERE - SLOPE

REGIONAL INTERPRETATIONS

	FOOTNOTES	REGIONAL INTERPRETATIONS
REGION 171		
REGION 181		

KEYING ONLY

SOURCE MATERIAL

	FOOTNOTES	SOURCE MATERIAL
FILL 191	ROADFILL	POOR - THIN LAYER
SAND 201	SAND	POOR
GRAVEL 211	GRAVEL	UNSUITED
SOIL 221	TOPSOIL	10-15%: POOR - THIN LAYER 15+%: POOR - SLOPE, THIN LAYER

WATER MANAGEMENT

	FOOTNOTES	WATER MANAGEMENT
PONDRS 231	POND RESERVOIR AREA	DEPTH TO ROCK, SLOPE, PERCS RAPIDLY
DIKES 241	EMBANKMENTS DIKES AND LEVEES	THIN LAYER, PERCS RAPIDLY, PIPING
PONDAQ 251	EXCAVATEO PONDS AQUIFER FEO	NO WATER
DRAIN 261	DRAINAGE	DEPTH TO ROCK
IRRIG 271	IRRIGATION	COMPLEX SLOPE, ROOTING DEPTH
TERRAC 281	TERRACES ANO DIVERSIONS	--
WATERW 291	GRASSEO WATERWAYS	--

KEYING ONLY — RECORD NO. / CONTROL WORD / NO.

UNIT NAME: HUGUSTON
UNIT MODIFIER:

RECREATION

KEYING ONLY	NO.		FOOTNOTE
CAMPS	301	CAMP AREAS	10-15%: MODERATE - SLOPE 15+%: SEVERE - SLOPE
PICNIC	311	PICNIC AREAS	10-15%: MODERATE - SLOPE 15+%: SEVERE - SLOPE
PLAYGD	321	PLAYGROUNDS	SEVERE - SLOPE, DEPTH TO ROCK
PATHS	331	PATHS AND TRAILS	10-15%: SLIGHT 15-25%: MODERATE - SLOPE 25+%: SEVERE - SLOPE

CAPABILITY AND PREDICTED YIELDS - CROPS AND PASTURE (HIGH LEVEL MANAGEMENT)

FOOTNOTE

KEYING ONLY	NO.	CLASS-DETERMINING PHASE	CAPABILITY NIRR	CAPABILITY IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.
CROPHO	451																	
CROPS	341	ALL	7E	--														
	351																	

WOODLAND SUITABILITY

FOOTNOTE

KEYING ONLY	NO.	CLASS-DETERMINING PHASE	ORD SYM	MANAGEMENT PROBLEMS: EROSION HAZARD	EQUIP. LIMIT	SEEDLING MORT'Y.	WINDTH. HAZARD	PLANT COMPET.	POTENTIAL PRODUCTIVITY: IMPORTANT TREES	SITE INDEX	TREES TO PLANT
WOODS	361								NONE		
	371										

WIND BREAKS

FDOTNOTE

KEYING ONLY	NO.	CLASS-DETERMINING PHASE	SPECIES	HT	SPECIES	HT	SPECIES	HT	SPECIES	HT
WINDBK	381		NONE							

WILDLIFE HABITAT SUITABILITY

FOOTNOTE

KEYING ONLY	NO.	CLASS-DETERMINING PHASE	POTENTIAL FOR HABITAT ELEMENTS: GRAIN & SEED	GRASS & LEGUME	WILD HERB.	HARDWD TREES	CONIFER PLANTS	SHRUBS	WETLAND PLANTS	SHALLOW WATER	POTENTIAL AS HABITAT FOR: OPENLAND WILDLIFE	WOODLAND WILDLIFE	WETLAND WILDLIFE	RANGELAND WILDLIFE
WILDLF	391	ALL NIRR	V. POOR	V. POOR	POOR	--	--	POOR	V. POOR	V. POOR	V. POOR	--	V. POOR	POOR

POTENTIAL NATIVE PLANT COMMUNITY (RANGELAND OR FOREST UNDERSTORY VEGETATION)

FOOTNOTE

KEYING ONLY	NO.	COMMON PLANT NAME	PLANT SYMBOL (NLSPN)	PERCENTAGE COMPOSITION (DRY WEIGHT) BY CLASS DETERMINING PHASE
PHASE	401			
PLANT	411	NEEDLEANDTHREAD	STCO4	30
	2	INDIAN RICEGRASS	ORHY	10
	3	NEEOLELEAF SEOGE	CAEL2	10
	4	LOW RABBITBRUSH	CHVIH2	10
	5	THICKSPIKE WHEATGRASS	AGOA	5
	6	SANDBERG BLUEGRASS	POSE	5
	7	WINTERFAT	EUROT	5
	8	BIG SAGEBRUSH	ARTR2	5
	9	SHADSCALE	ATCO	5
	421		OTHER	15
PRODUC	431	POTENTIAL PRODUCTION (LBS./AC. DRY WT): FAVORABLE YEARS		450
	2	NORMAL YEARS		350
	3	UNFAVORABLE YEARS		200

NOTES	441	SYM.	FOOTNOTES
	2		
	3		
	4		
	5		
	6		
	7		

SCS-SOILS-5
REV. MAY 1972
FILE CODE SOILS-12

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

SOIL SURVEY INTERPRETATIONS

KEYING ONLY: RECORD NO. | CONTROL WORD MLRA | NO. 001 | STATE | 011

MLRA(S) 34 | KIND OF UNIT SERIES | UNIT NAME KOONICH
STATE WYOMING | RECORD NO. | AUTHOR(S) JRS | DATE 2/73 | REVISED | UNIT MODIFIER

CLASSIFICATION AND BRIEF SOIL DESCRIPTION

CLASS 021: TYPIC TORRIORTHENTS, SANDY, MIXED, FRIGID

DESCR 031: THE KOONICH SERIES ARE WELL DRAINED SOILS FORMED IN ALLUVIUM ON ALLUVIAL FANS. SLOPES ARE 0 TO 3 PERCENT. ELEVATION IS 6,800 TO 7,000 FEET. PRECIPITATION IS 7 TO 9 INCHES, MEAN ANNUAL AIR TEMPERATURE IS ABOUT 36°F., AND THE GROWING SEASON IS ABOUT 80 TO 90 DAYS. TYPICALLY, THE SURFACE LAYER IS GRAYISH BROWN SANDY LOAM ABOUT 3 INCHES THICK. THE UNDERLYING LAYER IS GRAYISH BROWN TO BROWN SANDY LOAM ABOUT 20 INCHES THICK. THE SUBSTRATUM IS LIGHT BROWNISH GRAY FINE SAND TO BROWN SAND TO 60 INCHES OR MORE.

ESTIMATED SOIL PROPERTIES

	FOOTNOTE	DEPTH (IN.)	USDA TEXTURE	UNIFIED	AASHO	FRACT. >3 IN. (PCT)	PERCENT OF MATERIAL LESS THAN 3 IN. PASSING SIEVE 4	10	40	200	LIQUID LIMIT	PLASTICITY INDEX
PROP 041	1	0-23	SL	SM-SC, SC	A-2	0	85-95	80-90	50-65	25-35	15-20	5-10
	2	23-60	S	SM, SM-SC	A-2	0	85-95	80-90	50-70	15-25	10-15	NP-5
	3											
	4											
	5											
	6											

	DEPTH (IN.)	PERMEABILITY (IN/HR)	AVAILABLE WATER CAPACITY (IN/IN)	SOIL REACTION (pH)	SALINITY (MMHOS/CM)	SHRINK-SWELL POTENTIAL	CORROSIVITY STEEL	CORROSIVITY CONCRETE	EROSION FACTORS K	EROSION FACTORS T	WIND EROD. GROUP
PROP 051	SAME DEPTH AS ABOVE	2.0-6.0	.11-.13	6.6-7.3	2.0-4.0	LOW	HIGH	LOW	.20	5	3
2		6.0-20.0	.05-.07	6.6-7.3	2.0-4.0	LOW	HIGH	LOW	.15	5	1
3											
4											
5											
6											

	FLOODING FREQUENCY	FLOODING DURATION	FLOODING MONTHS	HIGH WATER TABLE DEPTH (FT)	HIGH WATER TABLE KIND	HIGH WATER TABLE MONTHS	CEMENTED PAN DEPTH (IN)	CEMENTED PAN HARDNESS	BEDROCK DEPTH (IN)	BEDROCK HARDNESS	SUBSIDENCE INITIAL (IN)	SUBSIDENCE TOTAL (IN)	HYD GRP	POTENTIAL FROST ACTION
PROP 061	RARE	VERY BRIEF	MAY-AUG.	<6					>60		--		A	LOW

	FOOTNOTES	SANITARY FACILITIES	KEYING ONLY		FOOTNOTES	SOURCE MATERIAL
SEPTIC 071	SEPTIC TANK ABSORPTION FIELDS	SLIGHT	FILL	191	ROADFILL	GOOD
LAGOON 081	SEWAGE LAGOONS	SEVERE - PERCS RAPIDLY, FLOODS	SAND	201	SAND	UNSUITED
TRENCH 091	SANITARY LANDFILL (TRENCH)	SEVERE - PERCS RAPIDLY	GRAVEL	211	GRAVEL	UNSUITED
SANARE 101	SANITARY LANDFILL (AREA)	SEVERE - PERCS RAPIDLY	SOIL	221	TOPSOIL	GOOD
COVER 111	DAILY COVER FOR LANDFILL	POOR - TOO SANDY			FOOTNOTES	WATER MANAGEMENT
	FOOTNOTES	COMMUNITY DEVELOPMENT	PONDRS	231	POND RESERVOIR AREA	PERCS RAPIDLY
EXCAV 121	SHALLOW EXCAVATIONS	MODERATE - FLOODS	DIKES	241	EMBANKMENTS OIKES AND LEVEES	PERCS RAPIDLY
DWEL 131	DWELLINGS WITHOUT BASEMENTS	SEVERE - FLOODS	PONDAQ	251	EXCAVATED PONDS AQUIFER FED	DEEP TO WATER
DWEL 141	DWELLINGS WITH BASEMENTS	SEVERE - FLOODS	DRAIN	261	DRAINAGE	FLOODS
BLDGS 151	SMALL COMMERCIAL BUILDINGS	SEVERE - FLOODS	IRRIG	271	IRRIGATION	FLOODS
ROADS 161	LOCAL ROADS AND STREETS	MODERATE - FLOODS	TERRAC	281	TERRACES AND DIVERSIONS	--
	FOOTNOTES	REGIONAL INTERPRETATIONS	WATERW	291	GRASSED WATERWAYS	--
REGION 171						
REGION 181						

KEYING ONLY — RECORD NO. / CONTROL WORD / NO.

UNIT NAME: KOONICH
UNIT MODIFIER:

RECREATION

KEYING ONLY			FOOTNOTE
CAMPS	301	CAMP AREAS	SEVERE - FLOODS
PICNIC	311	PICNIC AREAS	MODERATE - FLOODS
PLAYGD	321	PLAYGROUNDS	0-2%: MODERATE - FLOODS 3+%: MODERATE - SLOPE, FLOODS
PATHS	331	PATHS AND TRAILS	SLIGHT

CAPABILITY AND PREDICTED YIELDS - CROPS AND PASTURE (HIGH LEVEL MANAGEMENT)

FOOTNOTE

CROPHO 451	CROPS 341	CLASS-DETERMINING PHASE	CAPABILITY NIRR	CAPABILITY IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.
	1	ALL	6E	--																
	2																			
	3																			
	4																			
	5																			
	6																			
	7																			
	8																			
	9																			
	351																			
	2																			
	3																			

WOODLAND SUITABILITY

FOOTNOTE

WOODS 361	CLASS-DETERMINING PHASE	ORD SYM	MANAGEMENT PROBLEMS: EROSION HAZARD	EQUIP. LIMIT	SEEDLING MORT'Y.	WINDTH. HAZARD	PLANT COMPET.	POTENTIAL PRODUCTIVITY: IMPORTANT TREES	SITE INDEX	TREES TO PLANT
1	NONE							NONE		
2										
3										
4										
5										
6										
7										
8										
9										
371										
2										
3										
4										
5										
6										

WIND BREAKS

FOOTNOTE

WINOBK 381	CLASS-DETERMINING PHASE	SPECIES	HT	SPECIES	HT	SPECIES	HT	SPECIES	HT
1	NONE								
2									
3									
4									
5									
6									

WILDLIFE HABITAT SUITABILITY

FOOTNOTE

WILOLF 391	CLASS-DETERMINING PHASE	POTENTIAL FOR HABITAT ELEMENTS: GRAIN & SEED	GRASS & LEGUME	WILD HERB.	HARDWO TREES	CONIFER PLANTS	SHRUBS	WETLAND PLANTS	SHALLOW WATER	POTENTIAL AS HABITAT FOR: OPENLAND WILDLIFE	WOODLAND WILDLIFE	WETLAND WILDLIFE	RANGELAND WILDLIFE
1	ALL	FAIR	FAIR	FAIR	--	--	FAIR	POOR	POOR	FAIR	--	POOR	FAIR
2													
3													
4													
5													
6													

POTENTIAL NATIVE PLANT COMMUNITY (RANGELAND OR FOREST UNDERSTORY VEGETATION)

FOOTNOTE

PHASE 401	PLANT 411	COMMON PLANT NAME	PLANT SYMBOL (NLSPN)	PERCENTAGE COMPOSITION (DRY WEIGHT) BY CLASS DETERMINING PHASE
1	1	NEEDLEANDTHREAD	STCO4	30
2	2	INDIAN RICEGRASS	ORHY	10
	3	THICKSPIKE WHEATGRASS	AGDA	10
	4	LOW RABBITBRUSH	CHVIH2	10
	5	BLUEBUNCH WHEATGRASS	AGSP	5
	6	BOTTLEBRUSH SQUIRRELTAIL	SIHY	5
	7	PRAIRIE JUNEGRASS	KOCR	5
	8	NEEDLELEAF SEDGE	CAEL2	5
	9	BIG SAGEBRUSH	ARTR2	5
	421	SPINY HOPSAGE	GRSP	5
	2		OTHER	10
	3			
	4			
	5			
	6			

PROOUC 431	POTENTIAL PRODUCTION (LBS./AC. DRY WT):	
1	FAVORABLE YEARS	700
2	NORMAL YEARS	500
3	UNFAVORABLE YEARS	300

NOTES 441	SYM.	FOOTNOTES
1		
2		
3		
4		
5		
6		
7		

SCS-SOILS-S
REV. MAY 1972
FILE CODE SOILS-12

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

SOIL SURVEY INTERPRETATIONS

KEYING ONLY — RECORD NO. — CONTROL: WDRO, MLRA 001, STATE 011

MLRA(S) 34 | KIND OF UNIT SERIES | UNIT NAME LANEY
STATE WYOMING | RECORD NO. | AUTHOR(S) JRS | DATE 2/73 | REVISED | UNIT MODIFIER

CLASSIFICATION AND BRIEF SOIL DESCRIPTION

CLASS 021: TYPIC TORRIFLUVENTS, FINE-LOAMY, MIXED (CALCAREOUS), FRIGID

OESCR 031: THE LANEY SERIES ARE WELL DRAINED SOILS FORMED IN ALLUVIUM FROM ALKALINE SHALE ON ALLUVIAL FANS. SLOPES ARE 0 TO 3 PERCENT. ELEVATION IS 6,800 TO 7,000 FEET. PRECIPITATION IS 7 TO 9 INCHES. MEAN ANNUAL AIR TEMPERATURE IS ABOUT 36°F., AND THE GROWING SEASON IS ABOUT 80 TO 90 DAYS. TYPICALLY, THE SURFACE LAYER IS LIGHT BROWNISH GRAY LOAM ABOUT 3 INCHES THICK. THE UNDERLYING LAYER IS LIGHT OLIVE GRAY TO OLIVE GRAY LOAM ABOUT 33 INCHES THICK. THE SUBSTRATUM IS OLIVE, STRATIFIED CLAY LOAM TO STRATIFIED VERY FINE SANDY LOAM TO 60 INCHES OR MORE.

ESTIMATED SOIL PROPERTIES

PROP	FOOTNOTE	DEPTH (IN.)	USOA TEXTURE	UNIFIED	AASHO	FRACT. >3 IN. (PCT)	PERCENT OF MATERIAL LESS THAN 3 IN. PASSING SIEVE: 4	10	40	200	LIQUID LIMIT	PLASTICITY INDEX
041		0-36	L	CL	A-6	0	90-100	90-100	90-100	70-80	25-35	15-25
2		36-60	CL	CL	A-6	0	90-100	90-100	90-100	70-80	25-35	20-30
3												
4												
5												
6												

PROP	DEPTH (IN.)	PERMEABILITY (IN/HR)	AVAILABLE WATER CAPACITY (IN/IN)	SOIL REACTION (pH)	SALINITY (MMHOS/CM)	SHRINK-SWELL POTENTIAL	CORROSIVITY: STEEL	CONCRETE	EROSION FACTORS: K	T	WIND EROD. GROUP
051		.20-.6	.08-.09	8.5->9.0	4.0-8.0	MODERATE	HIGH	MODERATE	.24	5	4L
2	SAME DEPTH AS ABOVE	.20-.6	.09-.10	>9.0	4.0-8.0	MODERATE	HIGH	MODERATE	.37	5	4L
3											
4											
5											
6											

PROP	FLOODING: FREQUENCY	DURATION	MONTHS	HIGH WATER TABLE: DEPTH (FT)	KIND	MONTHS	CEMENTED PAN: DEPTH (IN)	HARDNESS	BEDROCK: DEPTH (IN)	HARDNESS	SUBSIDENCE: INITIAL (IN)	TOTAL (IN)	HYD GRP	POTENTIAL FROST ACTION
061	NONE			<6			--		>60		--		C	MODERATE

SANITARY FACILITIES

	FOOTNOTES	
SEPTIC 071	SEPTIC TANK ABSORPTION FIELDS	SEVERE - PERCS SLOWLY
LAGOON 081	SEWAGE LAGOONS	SLIGHT
TRENCH 091	SANITARY LANDFILL (TRENCH)	MODERATE - TOO CLAYEY
SANARE 101	SANITARY LANDFILL (AREA)	SLIGHT
COVER 111	DAILY COVER FOR LANDFILL	FAIR - TOO CLAYEY

COMMUNITY DEVELOPMENT

	FOOTNOTES	
EXCAV 121	SHALLOW EXCAVATIONS	MODERATE - TOO CLAYEY
DWEL 131	DWELLINGS WITHOUT BASEMENTS	MODERATE - SHRINK-SWELL, FROST ACTION, LOW STRENGTH
DWEL 141	DWELLINGS WITH BASEMENTS	MODERATE - SHRINK-SWELL, FROST ACTION, LOW STRENGTH
BLDGS 151	SMALL COMMERCIAL BUILDINGS	MODERATE - SHRINK-SWELL, LOW STRENGTH, FROST ACTION
ROADS 161	LOCAL ROADS AND STREETS	SEVERE - LOW STRENGTH

REGIONAL INTERPRETATIONS

	FOOTNOTES	
REGION 171		
REGION 181		

SOURCE MATERIAL

KEYING ONLY	FOOTNOTES	
FILL 191	ROADFILL	POOR - LOW STRENGTH, AREA RECLAIM
SAND 201	SAND	UNSUITED
GRAVEL 211	GRAVEL	UNSUITED
SOIL 221	TOPSOIL	POOR - EXCESS ALKALI

WATER MANAGEMENT

	FOOTNOTES	
PONDRS 231	POND RESERVOIR AREA	FAVORABLE
DIKES 241	EMBANKMENTS DIKES AND LEVEES	LOW STRENGTH, UNSTABLE FILL
PONDAQ 251	EXCAVATED PONDS AQUIFER FED	NO WATER
DRAIN 261	DRAINAGE	EXCESS ALKALI
IRRIG 271	IRRIGATION	EXCESS ALKALI, ERODES EASILY, PERCS SLOWLY
TERRAC 281	TERRACES AND DIVERSIONS	--
WATERW 291	GRASSED WATERWAYS	--

KEYING ONLY — RECORD NO. / CONTROL WORD / NO.

UNIT NAME: LANEY
UNIT MODIFIER:

RECREATION

KEYING ONLY			FOOTNOTE
CAMPS	301	CAMP AREAS	SEVERE - DUSTY
PICNIC	311	PICNIC AREAS	SEVERE - DUSTY
PLAYGD	321	PLAYGROUNDS	0-2%: SEVERE - DUSTY 3+%: SEVERE - SLOPE, DUSTY
PATHS	331	PATHS AND TRAILS	MODERATE - DUSTY

CAPABILITY AND PREDICTED YIELDS - CROPS AND PASTURE (HIGH LEVEL MANAGEMENT)

FOOTNOTE

CROPHO 451	CROPS 341	CLASS-DETERMINING PHASE	CAPABILITY NIRR	CAPABILITY IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.
	1	ALL	7S	—														

WOODLAND SUITABILITY

FOOTNOTE

WOODS 361	CLASS-DETERMINING PHASE	ORD SYM	MANAGEMENT PROBLEMS: EROSION HAZARD	EQUIP. LIMIT	SEEDLING MORT'Y.	WINOTH. HAZARD	PLANT COMPET.	POTENTIAL PRODUCTIVITY: IMPORTANT TREES	SITE INDEX	TREES TO PLANT
1	NONE							NONE		

WIND BREAKS

FOOTNOTE

WINDBK 381	CLASS-DETERMINING PHASE	SPECIES	HT	SPECIES	HT	SPECIES	HT	SPECIES	HT
1	NONE								

WILDLIFE HABITAT SUITABILITY

FOOTNOTE

WILDLF 391	CLASS-DETERMINING PHASE	POTENTIAL FOR HABITAT ELEMENTS: GRAIN & SEED	GRASS & LEGUME	WILD HERB.	HARDWD TREES	CONIFER PLANTS	SHRUBS	WETLAND PLANTS	SHALLOW WATER	POTENTIAL AS HABITAT FOR: OPENLAND WILDLIFE	WOODLAND WILDLIFE	WETLAND WILDLIFE	RANGELAND WILDLIFE
1	ALL	V. POOR	V. POOR	POOR	—	—	POOR	V. POOR	V. POOR	V. POOR	—	V. POOR	POOR

POTENTIAL NATIVE PLANT COMMUNITY (RANGELAND OR FOREST UNDERSTORY VEGETATION)

FOOTNOTE

PHASE 401	PLANT 411	COMMON PLANT NAME	PLANT SYMBOL (NLSPN)	PERCENTAGE COMPOSITION (DRY WEIGHT) BY CLASS DETERMINING PHASE
	1	GARDNER SALTBUSH	ATNU2	50
	2	BOTTLEBRUSH SQUIRRELTAIL	SIHY	10
	3	INDIAN RICEGRASS	ORHY	10
	4	THICKSPIKE WHEATGRASS	AGDA	5
	5	BUD SAGEBRUSH	ARSP5	5
	6	SANDBERG BLUEGRASS	POSE	5
	2	WINTERFAT	EUROT	5
	8		OTHER	10

PRODUC 431	POTENTIAL PRODUCTION (LBS./AC. DRY WT):	
1	FAVORABLE YEARS	600
2	NORMAL YEARS	450
3	UNFAVORABLE YEARS	300

FOOTNOTES

NOTES 441	SYM.	
1		

SCS-SOILS-S
REV. MAY 1972
FILE CODE SOILS-12

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

SOIL SURVEY INTERPRETATIONS

KEYING ONLY: RECORD NO. | CONTROL WORD MLRA 001, STATE 011

MLRA(S) 34 | KIND OF UNIT SERIES | UNIT NAME LITTSAN
STATE WYOMING | RECORD NO. | AUTHOR(S) JRS | DATE 2/73 | REVISED | UNIT MODIFIER

CLASSIFICATION AND BRIEF SOIL DESCRIPTION

CLASS 021: TYPIC HAPLARGIDS, COARSE-LOAMY, MIXED, FRIGID.

DESCR 031: THE LITTSAN SERIES ARE WELL DRAINED SOILS FORMED IN SANDY WIND-BORN DEPOSITS ON UPLANDS. SLOPES ARE 3 TO 10 PERCENT. ELEVATION IS 6,800 TO 7,000 FEET. PRECIPITATION IS 7 TO 9 INCHES, MEAN ANNUAL AIR TEMPERATURE IS ABOUT 36°F., AND THE GROWING SEASON IS ABOUT 80 TO 90 DAYS. TYPICALLY, THE SURFACE LAYER IS LIGHT BROWNISH GRAY FINE SANDY LOAM ABOUT 2 INCHES THICK. THE SUBSOIL IS PALE BROWN SANDY LOAM ABOUT 12 INCHES THICK. THE SUBSTRATUM IS PALE BROWN SANDY LOAM ABOUT 10 INCHES THICK AND IS UNDERLAIN BY SOFT SHALE AT A DEPTH OF 24 INCHES.

ESTIMATED SOIL PROPERTIES

FOOTNOTE	DEPTH (IN.)	USDA TEXTURE	UNIFIED	AASHO	FRACT. >3 IN. (PCT)	PERCENT OF MATERIAL LESS THAN 3 IN. PASSING SIEVE 4	10	40	200	LIQUID LIMIT	PLASTICITY INDEX
PROP 041	0-24	SL	SM, SM-SC	A-2	0	100	100	80-90	25-35	15-25	NP-5
	24+	VARIABLE	--	--	--	--	--	--	--	--	--

	DEPTH (IN.)	PERMEABILITY (IN/HR)	AVAILABLE WATER CAPACITY (IN/IN)	SOIL REACTION (pH)	SALINITY (MMHOS/CM)	SHRINK-SWELL POTENTIAL	CORROSIVITY STEEL	CORROSIVITY CONCRETE	EROSION FACTORS K	EROSION FACTORS T	WIND EROD. GROUP
PROP 051	SAME DEPTH AS ABOVE	2.0-6.0	.11-.13	6.6-7.8	2.0-4.0	LOW	HIGH	LOW	.24	3	3

	FLOODING FREQUENCY	FLOODING DURATION	FLOODING MONTHS	HIGH WATER TABLE DEPTH (FT)	HIGH WATER TABLE KIND	HIGH WATER TABLE MONTHS	CEMENTED PAN DEPTH (IN)	CEMENTED PAN HARDNESS	BEDROCK DEPTH (IN)	BEDROCK HARDNESS	SUBSIDENCE INITIAL (IN)	SUBSIDENCE TOTAL (IN)	HYD GRP	POTENTIAL FROST ACTION
PROP 061	NONE			>6					20-40	RIPPABLE	--		B	LOW

SANITARY FACILITIES

FOOTNOTES		
SEPTIC 071	SEPTIC TANK ABSORPTION FIELDS	SEVERE - DEPTH TO ROCK
LAGOON 081	SEWAGE LAGOONS	3-7%: SEVERE - DEPTH TO ROCK 7+%: SEVERE - SLOPE, DEPTH TO ROCK
TRENCH 091	SANITARY LANDFILL (TRENCH)	SEVERE - PERCS RAPIDLY
SANARE 101	SANITARY LANOFILL (AREA)	SEVERE - PERCS RAPIDLY
COVER 111	DAILY COVER FOR LANOFILL	FAIR - THIN LAYER

COMMUNITY DEVELOPMENT

FOOTNOTES		
EXCAV 121	SHALLOW EXCAVATIONS	3-8%: MODERATE - DEPTH TO ROCK 8+%: MOOERATE - SLOPE, DEPTH TO ROCK
DWEL 131	OWELLINGS WITHOUT BASEMENTS	3-8%: SLIGHT 8+%: MODERATE - SLOPE
DWEL 141	DWELLINGS WITH BASEMENTS	3-8%: MODERATE - DEPTH TO ROCK 8+%: MODERATE - SLOPE, DEPTH TO ROCK
BLDGS 151	SMALL COMMERCIAL BUILDINGS	MODERATE - SLOPE, DEPTH TO ROCK
ROADS 161	LOCAL ROADS AND STREETS	3-8%: SLIGHT 8+%: MODERATE - SLOPE

REGIONAL INTERPRETATIONS

FOOTNOTES	
REGION 171	
REGION 181	

SOURCE MATERIAL

KEYING ONLY	FOOTNOTES	
FILL 191	ROADFILL	POOR - THIN LAYER
SAND 201	SAND	POOR
GRAVEL 211	GRAVEL	UNSUITED
SOIL 221	TOPSOIL	GOOD

WATER MANAGEMENT

FOOTNOTES	
PONDRS 231	POND RESERVOIR AREA: SLOPE, PERCS RAPIDLY
DIKES 241	EMBANKMENTS OIKES AND LEVEES: PERCS RAPIDLY
PONDAQ 251	EXCAVATED PONDS AQUIFER FED: NO WATER
DRAIN 261	DRAINAGE: DEPTH TO ROCK
IRRIG 271	IRRIGATION: SLOPE, ROOTING DEPTH, ERODES EASILY
TERRAC 281	TERRACES AND DIVERSIONS: --
WATERW 291	GRASSED WATERWAYS: --

KEYING ONLY — RECORD NO. / CONTROL WORD / NO.

UNIT NAME: LITTSAN
UNIT MODIFIER:

RECREATION

KEYING ONLY				FOOTNOTE
CAMPS	301	CAMP AREAS		3-8%: SLIGHT 8+%: MODERATE - SLOPE
PICNIC	311	PICNIC AREAS		3-8%: SLIGHT 8+%: MODERATE - SLOPE
PLAYGO	321	PLAYGROUNDS		3-6%: MODERATE - SLOPE, DEPTH TO ROCK 6+%: SEVERE - SLOPE
PATHS	331	PATHS AND TRAILS		SLIGHT

CAPABILITY AND PREDICTED YIELDS - CROPS AND PASTURE (HIGH LEVEL MANAGEMENT)

FOOTNOTE

CROPHD	CROPS	CLASS-DETERMINING PHASE	CAPABILITY NIRR	CAPABILITY IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.
451	341	ALL	6E	--														

WOODLAND SUITABILITY

FOOTNOTE

WOODS	CLASS-DETERMINING PHASE	ORD SYM	MANAGEMENT PROBLEMS: EROSION HAZARD	EQUIP. LIMIT	SEEDLING MORT'Y.	WINDTH. HAZARD	PLANT COMPET.	POTENTIAL PRODUCTIVITY: IMPORTANT TREES	SITE INDEX	TREES TO PLANT
361	NONE							NONE		

WIND BREAKS

FOOTNOTE

WINOBK	CLASS-DETERMINING PHASE	SPECIES	HT	SPECIES	HT	SPECIES	HT	SPECIES	HT
381	NONE								

WILDLIFE HABITAT SUITABILITY

FOOTNOTE

WILDLF	CLASS-DETERMINING PHASE	POTENTIAL FOR HABITAT ELEMENTS: GRAIN & SEED	GRASS & LEGUME	WILD HERB.	HARDWD TREES	CONIFER PLANTS	SHRUBS	WETLAND PLANTS	SHALLOW WATER	POTENTIAL AS HABITAT FOR: OPENLAND WILDLIFE	WOODLAND WILDLIFE	WETLAND WILDLIFE	RANGELAND WILDLIFE
391	ALL	POOR	POOR	FAIR	---	---	FAIR	V. POOR	V. POOR	POOR	---	V. POOR	FAIR

POTENTIAL NATIVE PLANT COMMUNITY (RANGELAND OR FOREST UNDERSTORY VEGETATION)

FOOTNOTE

PHASE	PLANT	COMMON PLANT NAME	PLANT SYMBOL (NLSPN)	PERCENTAGE COMPOSITION (DRY WEIGHT) BY CLASS DETERMINING PHASE
401	411	NEEDLEANDTHREAD	STC04	30
	421	INDIAN RICEGRASS	ORHY	10
		THICKSPIKE WHEATGRASS	AGDA	10
		LOW RABBITBRUSH	CHVIH2	10
		BLUEBUNCH WHEATGRASS	AGSP	5
		BOTTLEBRUSH SQUIRRELTAIL	SIHY	5
		PRAIRIE JUNEGRASS	KOCR	5
		NEEDLELEAF SEDGE	CAEL2	5
		BIG SAGEBRUSH	ARTR2	5
		SPINY HOPSAGE	GRSP	5
			OTHER	10

PRODUC	POTENTIAL PRODUCTION (LBS./AC. DRY WT):	
431	FAVORABLE YEARS	700
	NORMAL YEARS	500
	UNFAVORABLE YEARS	300

FOOTNOTES

NOTES	SYM.
441	

SCS-SOILS-5
REV. MAY 1972
FILE CODE SOILS-12

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

SOIL SURVEY INTERPRETATIONS

KEYING ONLY — RECORD NO. — CONTROL: WORO, MLRA, STATE — NO.: 001, 011

MLRA(S): 34 | KIND OF UNIT: SERIES | UNIT NAME: MILREN
STATE: WYOMING | RECORD NO.: | AUTHOR(S): JRS | DATE: 2/73 | REVISED: | UNIT MODIFIER:

CLASSIFICATION AND BRIEF SOIL DESCRIPTION

CLASS 021: BOROLLIC PALEARGIDS, FINE, MONTMORILLONITIC

DESCR 031: THE MILREN SERIES ARE WELL DRAINED SOILS FORMED IN ALLUVIUM ON ALLUVIAL FANS. SLOPES ARE 3 TO 10 PERCENT. ELEVATION IS 7,000 TO 7,300 FEET. PRECIPITATION IS 10 TO 12 INCHES, MEAN ANNUAL AIR TEMPERATURE IS ABOUT 36°F., AND THE GROWING SEASON IS ABOUT 80 TO 90 DAYS. TYPICALLY, THE SURFACE LAYER IS BROWN SANDY LOAM ABOUT 2 INCHES THICK. THE SUBSURFACE LAYER IS LIGHT BROWNISH GRAY SANDY LOAM ABOUT 1 INCH THICK. THE SUBSOIL IS BROWN CLAY TO SANDY CLAY LOAM ABOUT 21 INCHES THICK. THE SUBSTRATUM IS LIGHT BROWNISH GRAY SANDY CLAY LOAM TO 60 INCHES OR MORE.

ESTIMATED SOIL PROPERTIES

FOOTNOTE	OEPTH (IN.)	USDA TEXTURE	UNIFIED	AASHO	FRACT. >3 IN. (PCT)	PERCENT OF MATERIAL LESS THAN 3 IN. PASSING SIEVE 4	10	40	200	LIQUID LIMIT	PLAS-TICITY INDEX
PROP 041	0-16	C	CL	A-6	0	100	100	80-90	50-60	25-35	15-25
2	16-60	SCL	SC	A-6	0	100	100	60-70	35-50	20-30	15-20
3											
4											
5											
6											

	DEPTH (IN.)	PERMEABILITY (IN/HR)	AVAILABLE WATER CAPACITY (IN/IN)	SOIL REACTION (pH)	SALINITY (MMHOS/CM)	SHRINK-SWELL POTENTIAL	CORROSIVITY STEEL	CORROSIVITY CONCRETE	EROSION FACTORS K	EROSION FACTORS T	WIND EROD. GROUP
PROP 051	SAME OEPTH AS ABOVE	.20-.6	.14-.16	7.4-8.4	2.0-4.0	HIGH	HIGH	LOW	.37	5	5
2		.20-.6	.07-.09	7.9->9.0	2.0-4.0	MODERATE	HIGH	MODERATE	.28	5	5
3											
4											
5											
6											

	FLOODING FREQUENCY	FLOODING DURATION	FLOODING MONTHS	HIGH WATER TABLE DEPTH (FT)	HIGH WATER TABLE KIND	HIGH WATER TABLE MONTHS	CEMENTED PAN DEPTH (IN)	CEMENTED PAN HARDNESS	BEDROCK DEPTH (IN)	BEDROCK HARDNESS	SUBSIDENCE INITIAL (IN)	SUBSIDENCE TOTAL (IN)	HYD GRP	POTENTIAL FROST ACTION
PROP 061	NONE			>6			--		>60		—		C	LOW

SANITARY FACILITIES

	FOOTNOTES	
SEPTIC 071	SEPTIC TANK ABSORPTION FIELDS	SEVERE - PERCS SLOWLY
LAGOON 081	SEWAGE LAGOONS	3-7%: MODERATE - SLOPE 7+%: SEVERE - SLOPE
TRENCH 091	SANITARY LANDFILL (TRENCH)	MODERATE - TOO CLAYEY
SANARE 101	SANITARY LANDFILL (AREA)	3-8%: SLIGHT 8+%: MODERATE - SLOPE
COVER 111	DAILY COVER FOR LANDFILL	FAIR - TOO CLAYEY

COMMUNITY DEVELOPMENT

	FOOTNOTES	
EXCAV 121	SHALLOW EXCAVATIONS	3-8%: MODERATE - TOO CLAYEY 8+%: MODERATE - TOO CLAYEY, SLOPE
DWEL 131	DWELLINGS WITHOUT BASEMENTS	SEVERE - SHRINK-SWELL
DWEL 141	DWELLINGS WITH BASEMENTS	SEVERE - SHRINK-SWELL
BLDGS 151	SMALL COMMERCIAL BUILDINGS	3-8%: SEVERE - SHRINK-SWELL 8+%: SEVERE - SLOPE, SHRINK-SWELL
ROADS 161	LOCAL ROADS AND STREETS	SEVERE - SHRINK-SWELL, LOW STRENGTH

REGIONAL INTERPRETATIONS

	FOOTNOTES	
REGION 171		
REGION 181		

KEYING ONLY

SOURCE MATERIAL

	FOOTNOTES	
FILL 191	ROADFILL	POOR - SHRINK-SWELL, LOW STRENGTH
SAND 201	SAND	UNSUITED
GRAVEL 211	GRAVEL	UNSUITED
SOIL 221	TOPSOIL	POOR - TOO CLAYEY, EXCESS ALKALI

WATER MANAGEMENT

	FOOTNOTES	
PONDS 231	POND RESERVOIR AREA	FAVORABLE
DIKES 241	EMBANKMENTS DIKES AND LEVEES	UNSTABLE FILL
PONDAQ 251	EXCAVATED PONDS AQUIFER FED	NO WATER
DRAIN 261	DRAINAGE	EXCESS ALKALI, PERCS SLOWLY
IRRIG 271	IRRIGATION	EXCESS ALKALI, PERCS SLOWLY
TERRAC 281	TERRACES AND DIVERSIONS	--
WATERW 291	GRASSED WATERWAYS	--

UNIT NAME: MILREN
UNIT MODIFIER:

RECREATION

KEYING ONLY RECORD NO.	CONTROL WORD	NO.		
	CAMPS	301	CAMP AREAS	FOOTNOTE: 3-8%: SLIGHT; 8+%: MODERATE - SLOPE
		2		
		3		
		4		
		5		
	PICNIC	311	PICNIC AREAS	3-8%: SLIGHT; 8+%: MODERATE - SLOPE
		2		
		3		
		4		
		5		

KEYING ONLY				
PLAYGD	321	PLAYGROUNDS	FOOTNOTE: 3-6%: MODERATE - PERCS SLOWLY, SLOPE; 6+%: SEVERE - SLOPE	
	2			
	3			
	4			
	5			
PATHS	331	PATHS AND TRAILS	SLIGHT	
	2			
	3			
	4			
	5			

CAPABILITY AND PREDICTED YIELDS - CROPS AND PASTURE (HIGH LEVEL MANAGEMENT)

FOOTNOTE

		CLASS-DETERMINING PHASE	CAPABILITY NIRR	CAPABILITY IRR.														
CROPHD	451																	
	2																	
	3																	
CROPS	341	ALL	6E	--														
	2																	
	3																	
	4																	
	5																	
	6																	
	7																	
	8																	
	9																	
	351																	
	2																	
	3																	

WOODLAND SUITABILITY

FOOTNOTE

	CLASS-DETERMINING PHASE	ORD SYM	MANAGEMENT PROBLEMS: EROSION HAZARD	EQUIP. LIMIT	SEEDLING MORT'Y.	WINDTH. HAZARD	PLANT COMPET.	POTENTIAL PRODUCTIVITY: IMPORTANT TREES	SITE INDEX	TREES TO PLANT
WOODS 361	NONE							NONE		
2										
3										
4										
5										
6										
7										
8										
9										
371										
2										
3										
4										
5										
6										

WIND BREAKS

FOOTNOTE

	CLASS-DETERMINING PHASE	SPECIES	HT	SPECIES	HT	SPECIES	HT	SPECIES	HT
WINDBK 381	NONE								
2									
3									
4									
5									
6									

WILDLIFE HABITAT SUITABILITY

FOOTNOTE

	CLASS-DETERMINING PHASE	POTENTIAL FOR HABITAT ELEMENTS: GRAIN & SEED	GRASS & LEGUME	WILD HERB.	HAROWO TREES	CONIFER PLANTS	SHRUBS	WETLAND PLANTS	SHALLOW WATER	POTENTIAL AS HABITAT FOR: OPENLAND WILDLIFE	WOODLAND WILDLIFE	WETLAND WILDLIFE	RANGELAND WILDLIFE
WILDLF 391	ALL	FAIR	FAIR	FAIR	--	--	FAIR	POOR	POOR	FAIR	--	FAIR	FAIR
2													
3													
4													
5													
6													

POTENTIAL NATIVE PLANT COMMUNITY (RANGELAND OR FOREST UNDERSTORY VEGETATION)

FOOTNOTE

	COMMON PLANT NAME	PLANT SYMBOL (NLSPN)	PERCENTAGE COMPOSITION (ORY WEIGHT) BY CLASS DETERMINING PHASE
PHASE 401			
2			
PLANT 411	BIG SAGEBRUSH	ARTR2	10
2	MUTTON BLUEGRASS	POFE	10
3	THICKSPIKE WHEATGRASS	AGDA	40
4	BOTTLEBRUSH SQUIRRELTAIL	SIHY	5
5	INDIAN RICEGRASS	ORHY	5
6	LETTERMAN NEEDLEGRASS	STLE4	5
7	PRAIRIE JUNEGRASS	KOCR	5
8	SANDBERG BLUEGRASS	POSE	5
9	LOW SAGEBRUSH	ARAR8	5
421		OTHER	10
2			
3			
4			
5			
6			
PRODUC 431	POTENTIAL PRODUCTION (LBS./AC. DRY WT): FAVORABLE YEARS		1,400
2	NORMAL YEARS		1,100
3	UNFAVORABLE YEARS		600

	SYM.	FOOTNOTES
NOTES 441		
2		
3		
4		
5		
6		
7		

SCS-SOILS-5
REV. MAY 1972
FILE CODE SOILS-12

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

SOIL SURVEY INTERPRETATIONS

KEYING ONLY — RECORD NO. | CONTROL WORD | CONTROL NO.

MLRA(S) 34 | KIND OF UNIT SERIES | UNIT NAME ONASON

STATE WYOMING | RECORD NO. | AUTHOR(S) JRS | DATE 2/73 | REVISED | UNIT MODIFIER

CLASSIFICATION AND BRIEF SOIL DESCRIPTION

CLASS 021: USTIC TORRIORTHENTS, LOAMY, MIXED, NONACID, FRIGID, SHALLOW

DESCR 031: THE ONASON SERIES ARE WELL DRAINED SOILS FORMED IN RESIDUUM FROM SANDSTONE ON RIDGES AND HILLSIDES. SLOPES ARE 10 TO 30 PERCENT. ELEVATION IS 7,000 TO 7,300 FEET. PRECIPITATION IS 10 TO 12 INCHES, MEAN ANNUAL AIR TEMPERATURE IS ABOUT 36°F., AND THE GROWING SEASON IS 80 TO 90 DAYS. TYPICALLY, THE SURFACE LAYER IS GRAYISH BROWN SANDY LOAM ABOUT 8 INCHES THICK. THE UNDERLYING LAYER IS GRAYISH BROWN GRAVELLY SANDY LOAM ABOUT 18 INCHES THICK AND IS UNDERLAIN BY SOFT ARKOSIC SANDSTONE AT A DEPTH OF 11 INCHES.

ESTIMATED SOIL PROPERTIES

FOOTNOTE	DEPTH (IN.)	USDA TEXTURE	UNIFIED	AASHO	FRACT. >3 IN. (PCT)	PERCENT OF MATERIAL LESS THAN 3 IN. PASSING SIEVE 4	10	40	200	LIQUID LIMIT	PLASTICITY INDEX
PROP 041	0-11	GR-SL	SM, SM-SC	A-2	0-5	70-80	60-70	35-50	15-30	10-15	NP-5
2	11+	WB									
3											
4											
5											
6											

	DEPTH (IN.)	PERMEABILITY (IN/HR)	AVAILABLE WATER CAPACITY (IN/IN)	SOIL REACTION (pH)	SALINITY (MMHOS/CM)	SHRINK-SWELL POTENTIAL	CORROSIVITY STEEL	CORROSIVITY CONCRETE	EROSION FACTORS K	EROSION FACTORS T	WIND EROD. GROUP
PROP 051	SAME DEPTH AS ABOVE	6.0-20.0	.08-.10	6.6-7.3	<2.0	LOW	HIGH	LOW	.20	1	3
2											
3											
4											
5											
6											

	FLOODING FREQUENCY	FLOODING DURATION	FLOODING MONTHS	HIGH WATER TABLE DEPTH (FT)	HIGH WATER TABLE KIND	HIGH WATER TABLE MONTHS	CEMENTED PAN DEPTH (IN)	CEMENTED PAN HARDNESS	BEDROCK DEPTH (IN)	BEDROCK HARDNESS	SUBSIDENCE INITIAL (IN)	SUBSIDENCE TOTAL (IN)	HYD GRP	POTENTIAL FROST ACTION
PROP 061	NONE			>6			—		10-20	RIPPABLE	--		C	LOW

SANITARY FACILITIES

FOOTNOTES		SANITARY FACILITIES
SEPTIC 071	SEPTIC TANK ABSORPTION FIELDS	10-15%: SEVERE - DEPTH TO ROCK 15+%: SEVERE - SLOPE, DEPTH TO ROCK
LAGOON 081	SEWAGE LAGOONS	SEVERE - SLOPE, PERCS RAPIDLY, DEPTH TO ROCK
TRENCH 091	SANITARY LANDFILL (TRENCH)	SEVERE - DEPTH TO ROCK, PERCS RAPIDLY
SANARE 101	SANITARY LANDFILL (AREA)	10-15%: SEVERE - PERCS RAPIDLY 15+%: SEVERE - SLOPE, PERCS RAPIDLY
COVER 111	DAILY COVER FOR LANDFILL	10-15%: POOR - THIN LAYER 15+%: POOR - SLOPE, THIN LAYER

COMMUNITY DEVELOPMENT

FOOTNOTES		COMMUNITY DEVELOPMENT
EXCAV 121	SHALLOW EXCAVATIONS	10-15%: SEVERE - DEPTH TO ROCK 15+%: SEVERE - SLOPE, DEPTH TO ROCK
DWEL 131	DWELLINGS WITHOUT BASEMENTS	10-15%: SEVERE - DEPTH TO ROCK 15+%: SEVERE - SLOPE, DEPTH TO ROCK
DWEL 141	DWELLINGS WITH BASEMENTS	10-15%: SEVERE - DEPTH TO ROCK 15+%: SEVERE - SLOPE, DEPTH TO ROCK
BLDGS 151	SMALL COMMERCIAL BUILDINGS	SEVERE - SLOPE, DEPTH TO ROCK
ROADS 161	LOCAL ROADS AND STREETS	10-15%: MODERATE - DEPTH TO ROCK 15+%: SEVERE - SLOPE

REGIONAL INTERPRETATIONS

FOOTNOTES		REGIONAL INTERPRETATIONS
REGION 171		
REGION 181		

SOURCE MATERIAL

KEYING ONLY	FOOTNOTES	SOURCE MATERIAL
FILL 191	ROADFILL	POOR - THIN LAYER
SAND 201	SAND	UNSUITED
GRAVEL 211	GRAVEL	UNSUITED
SOIL 221	TOPSOIL	10-15%: POOR - SMALL STONES, THIN LAYER 15+%: POOR - SLOPE, SMALL STONES, THIN LAYER

WATER MANAGEMENT

FOOTNOTES		WATER MANAGEMENT
PONDRS 231	POND RESERVOIR AREA	SLOPE, DEPTH TO ROCK, PERCS RAPIDLY
DIKES 241	EMBANKMENTS DIKES AND LEVEES	THIN LAYER, PERCS RAPIDLY
PONDAQ 251	EXCAVATED PONDS AQUIFER FED	NO WATER
DRAIN 261	DRAINAGE	DEPTH TO ROCK
IRRIG 271	IRRIGATION	SLOPE, ROOTING DEPTH, DROUGHTY
TERRAC 281	TERRACES AND DIVERSIONS	—
WATERW 291	GRASSED WATERWAYS	—

KEYING ONLY — RECORD NO. / CONTROL WORD / NO.

UNIT NAME: ONASON
UNIT MODIFIER:

RECREATION

KEYING ONLY			FOOTNOTE	KEYING ONLY			FOOTNOTE
	CAMPS	301	10-15%: MODERATE - SLOPE 15+%: SEVERE - SLOPE	PLAYGD	321	PLAYGROUNDS	SEVERE - SLOPE, DEPTH TO ROCK
	PICNIC	311	10-15%: MODERATE - SLOPE 15+%: SEVERE - SLOPE	PATHS	331	PATHS AND TRAILS	10-15%: SLIGHT 15-25%: MODERATE - SLOPE 25+%: SEVERE - SLOPE

CAPABILITY AND PREDICTED YIELDS - CROPS AND PASTURE (HIGH LEVEL MANAGEMENT)

		FOOTNOTE	CLASS-DETERMINING PHASE	CAPABILITY															
	CROPHD	451		NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.
	CROPS	341	ALL	7E	--														

WOODLAND SUITABILITY

		FOOTNOTE	CLASS-DETERMINING PHASE	ORD SYM	MANAGEMENT PROBLEMS: EROSION HAZARD	EQUIP. LIMIT	SEEDLING MORT'Y.	WINDTH. HAZARD	PLANT COMPET.	POTENTIAL PRODUCTIVITY: IMPORTANT TREES	SITE INDEX	TREES TO PLANT
	WOODS	361	NONE							NONE		

WIND BREAKS

		FOOTNOTE	CLASS-DETERMINING PHASE	SPECIES	HT	SPECIES	HT	SPECIES	HT	SPECIES	HT
	WINDBK	381	NONE								

WILDLIFE HABITAT SUITABILITY

		FOOTNOTE	CLASS-DETERMINING PHASE	POTENTIAL FOR HABITAT ELEMENTS: GRAIN & SEED	GRASS & LEGUME	WILD HERB.	HARDWO TREES	CONIFER PLANTS	SHRUBS	WETLAND PLANTS	SHALLOW WATER	POTENTIAL AS HABITAT FOR: OPENLAND WILDLIFE	WOODLAND WILDLIFE	WETLAND WILDLIFE	RANGELAND WILDLIFE
	WILDLF	391	ALL	V. POOR	V. POOR	POOR	--	--	POOR	V. POOR	V. POOR	V. POOR	--	V. POOR	POOR

POTENTIAL NATIVE PLANT COMMUNITY (RANGELAND OR FOREST UNDERSTORY VEGETATION)

		FOOTNOTE	COMMON PLANT NAME	PLANT SYMBOL (NLSPN)	PERCENTAGE COMPOSITION (DRY WEIGHT) BY CLASS DETERMINING PHASE
	PHASE	401			
	PLANT	411	INDIAN RICEGRASS	ORHY	20
		2	BLUEBUNCH WHEATGRASS	AGSP	15
		3	NEEDLEANDTHREAD	STCO4	10
		4	THICKSPIKE WHEATGRASS	AGDA	10
		5	BOTTLEBRUSH SQUIRRELTAIL	SIHY	5
		6	NEEDLELEAF SEDGE	CAEL2	5
		7	PRAIRIE JUNEGRASS	KOCR	5
		8	SANDBERG BLUEGRASS	POSE	5
		9	LOW RABBITBRUSH	CHVIH2	5
		421	SKUNKBUSH		5
		2		OTHER	10
		3			
		4			
		5			
		6			

		POTENTIAL PRODUCTION (LBS./AC. ORY WT):	
	PRODUC 431	FAVORABLE YEARS	1,200
	2	NORMAL YEARS	900
	3	UNFAVORABLE YEARS	700

		SYM.	FOOTNOTES
	NOTES 441		
	2		
	3		
	4		
	5		
	6		
	7		

SCS-SOILS-5
REV. MAY 1972
FILE CODE SOILS-12

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

SOIL SURVEY INTERPRETATIONS

KEYING ONLY — RECORD NO. — CONTROL WORD: MLRA 001, STATE 011

MLRA(S): 34 | KIND OF UNIT: SERIES | UNIT NAME: OURARD
STATE: WYOMING | RECORD NO.: | AUTHOR(S): JRS | DATE: 2/73 | REVISED: | UNIT MODIFIER:

CLASSIFICATION AND BRIEF SOIL DESCRIPTION (CLASS 021, DESCR 031)

TYPIC HAPLARGIDS, LOAMY, MIXED, FRIGID, SHALLOW.

THE OURARD SERIES ARE WELL DRAINED SOILS FORMED IN RESIDUUM FROM SHALE ON RIDGES. SLOPES ARE 3 TO 10 PERCENT. ELEVATION IS 6,800 TO 7,000 FEET. PRECIPITATION IS 7 TO 9 INCHES, MEAN ANNUAL AIR TEMPERATURE IS ABOUT 36°F. AND THE GROWING SEASON IS ABOUT 80 TO 90 DAYS. TYPICALLY, THE SURFACE LAYER IS BROWN SANDY LOAM ABOUT 2 INCHES THICK. THE SUBSOIL IS YELLOWISH BROWN TO LIGHT BROWNISH GRAY SANDY CLAY LOAM ABOUT 14 INCHES THICK AND IS UNDERLAIN BY SOFT SHALE AT A DEPTH OF 16 INCHES.

ESTIMATED SOIL PROPERTIES

PROP	FOOTNOTE	DEPTH (IN.)	USDA TEXTURE	UNIFIED	AASHO	FRACT. >3 IN. (PCT)	PERCENT OF MATERIAL LESS THAN 3 IN. PASSING SIEVE 4	10	40	200	LIQUID LIMIT	PLASTICITY INDEX
041		0-16	SCL	SC	A-2, A-6	0-5	95-100	90-100	60-70	30-40	20-30	10-15
042		16+	WB	--	--	--	--	--	--	--	--	--

PROP	DEPTH (IN.)	PERMEABILITY (IN/HR)	AVAILABLE WATER CAPACITY (IN/IN)	SOIL REACTION (pH)	SALINITY (MMHOS/CM)	SHRINK-SWELL POTENTIAL	CORROSIVITY STEEL	CORROSIVITY CONCRETE	EROSION FACTORS K	EROSION FACTORS T	WIND EROD. GROUP
051	0-16	.6-2.0	.14-.16	6.6-9.0	2.0-4.0	MODERATE	HIGH	MODERATE	.28	1	3
052	SAME DEPTH AS ABOVE										

PROP	FLOODING FREQUENCY	FLOODING DURATION	FLOODING MONTHS	HIGH WATER TABLE DEPTH (FT)	HIGH WATER TABLE KIND	HIGH WATER TABLE MONTHS	CEMENTED PAN DEPTH (IN)	CEMENTED PAN HARDNESS	BEDROCK DEPTH (IN)	BEDROCK HARDNESS	SUBSIDENCE INITIAL (IN)	SUBSIDENCE TOTAL (IN)	HYD GRP	POTENTIAL FROST ACTION
061	NONE			>6			--		10-20	RIPPABLE	--		D	LOW

SANITARY FACILITIES

	FOOTNOTES	
SEPTIC 071	SEPTIC TANK ABSORPTION FIELDS	SEVERE - DEPTH TO ROCK
LAGOON 081	SEWAGE LAGOONS	SEVERE - DEPTH TO ROCK
TRENCH 091	SANITARY LANDFILL (TRENCH)	SEVERE - DEPTH TO ROCK
SANARE 101	SANITARY LANDFILL (AREA)	3-8%: SLIGHT 8+%: MODERATE - SLOPE
COVER 111	DAILY COVER FOR LANDFILL	POOR - THIN LAYER

COMMUNITY DEVELOPMENT

	FOOTNOTES	
EXCAV 121	SHALLOW EXCAVATIONS	SEVERE - DEPTH TO ROCK
DWEL 131	DWELLINGS WITHOUT BASEMENTS	SEVERE - DEPTH TO ROCK
DWEL 141	DWELLINGS WITH BASEMENTS	SEVERE - DEPTH TO ROCK
BLDGS 151	SMALL COMMERCIAL BUILDINGS	SEVERE - DEPTH TO ROCK
ROADS 161	LOCAL ROADS AND STREETS	SEVERE - DEPTH TO ROCK

REGIONAL INTERPRETATIONS

	FOOTNOTES	
REGION 171		
REGION 181		

SOURCE MATERIAL

KEYING ONLY	FOOTNOTES	
FILL 191	ROADFILL	POOR - THIN LAYER
SAND 201	SAND	UNSUITED
GRAVEL 211	GRAVEL	UNSUITED
SOIL 221	TOPSOIL	POOR - THIN LAYER

WATER MANAGEMENT

	FOOTNOTES	
PONDRS 231	POND RESERVOIR AREA	DEPTH TO ROCK, SLOPE
DIKES 241	EMBANKMENTS DIKES AND LEVEES	THIN LAYER, PERCS RAPIDLY
PONDAQ 251	EXCAVATED PONDS AQUIFER FED	NO WATER
DRAIN 261	DRAINAGE	DEPTH TO ROCK, EXCESS ALKALI
IRRIG 271	IRRIGATION	COMPLEX SLOPE, ROOTING DEPTH
TERRAC 281	TERRACES AND DIVERSIONS	—
WATERW 291	GRASSED WATERWAYS	—

KEYING ONLY — RECORD NO. — CONTROL WORD — NO.

UNIT NAME: OUARO
UNIT MODIFIER:

RECREATION

KEYING ONLY				
CAMPS	301	CAMP AREAS	FOOTNOTE: 3-8%: SLIGHT; 8+%: MODERATE - SLOPE	
PICNIC	311	PICNIC AREAS	FOOTNOTE: 3-8%: SLIGHT; 8+%: MODERATE - SLOPE	
PLAYGO	321	PLAYGROUNDS	FOOTNOTE: 3-6%: SEVERE - DEPTH TO ROCK; 6+%: SEVERE - SLOPE, DEPTH TO ROCK	
PATHS	331	PATHS AND TRAILS	SLIGHT	

CAPABILITY AND PREDICTED YIELDS - CROPS AND PASTURE (HIGH LEVEL MANAGEMENT)

FOOTNOTE

CROPHD / CROPS	CLASS-DETERMINING PHASE	CAPABILITY NIRR	CAPABILITY IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.
451 / 341	ALL	7E	---														

WOODLAND SUITABILITY

FOOTNOTE

WOODS	CLASS-DETERMINING PHASE	ORO SYM	MANAGEMENT PROBLEMS: EROSION HAZARD	EQUIP. LIMIT	SEEDLING MORT'Y.	WINDTH. HAZARD	PLANT COMPET.	POTENTIAL PRODUCTIVITY: IMPORTANT TREES	SITE INDEX	TREES TO PLANT
361	NONE							NONE		

WIND BREAKS

FOOTNOTE

WINDBK	CLASS-DETERMINING PHASE	SPECIES	HT	SPECIES	HT	SPECIES	HT	SPECIES	HT
381	NONE								

WILDLIFE HABITAT SUITABILITY

FOOTNOTE

WILDLF	CLASS-DETERMINING PHASE	POTENTIAL FOR HABITAT ELEMENTS: GRAIN & SEED	GRASS & LEGUME	WILD HERB.	HAROWO TREES	CONIFER PLANTS	SHRUBS	WETLAND PLANTS	SHALLOW WATER	POTENTIAL AS HABITAT FOR: OPENLAND WILDLIFE	WOODLAND WILDLIFE	WETLAND WILDLIFE	RANGELAND WILDLIFE
391	ALL	V. POOR	V. POOR	POOR	---	---	POOR	V. POOR	V. POOR	V. POOR	---	V. POOR	POOR

POTENTIAL NATIVE PLANT COMMUNITY (RANGELAND OR FOREST UNDERSTORY VEGETATION)

FOOTNOTE

PHASE / PLANT	COMMON PLANT NAME	PLANT SYMBOL (NLSPN)	PERCENTAGE COMPOSITION (ORY WEIGHT) BY CLASS DETERMINING PHASE
401 / 411	BLUEBUNCH WHEATGRASS	AGSP	30
	THICKSPIKE WHEATGRASS	AGOA	15
	LETTERMAN NEEDLEGRASS	STLE4	10
	SANDBERG BLUEGRASS	POSE	10
	NEEDLEANDTHREAD	STCO4	5
	NEEDLELEAF SEDGE	CAEL2	5
	BIG SAGEBRUSH	ARTR2	5
		OTHER	15
421	POTENTIAL PRODUCTION (LBS./AC. ORY WT): FAVORABLE YEARS		450
	NORMAL YEARS		350
	UNFAVORABLE YEARS		200

NOTES 441

SYM. — FOOTNOTES

SCS-SOILS-5
REV. MAY 1972
FILE CODE SOILS-12

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

SOIL SURVEY INTERPRETATIONS

KEYING ONLY — RECORD NO. — CONTROL: WORO / MLRA 001 / STATE 011

MLRA(S): 34 | KIND OF UNIT: SERIES | UNIT NAME: RALLOD
STATE: WYOMING | RECORD NO.: | AUTHOR(S): JRS | DATE: 2/73 | REVISED: | UNIT MODIFIER:

CLASSIFICATION AND BRIEF SOIL DESCRIPTION

CLASS 021 / DESCR 031:
BOROLLIC NATRARGIDS, CLAYEY, MONTMORILLONITIC, SHALLOW

THE RALLOD SERIES ARE WELL DRAINED SOILS FORMED IN RESIDUUM FROM ALKALINE SHALE ON RIDGES AND HILLSIDES. SLOPES ARE 10 TO 30 PERCENT. ELEVATION IS 7,000 TO 7,300 FEET. PRECIPITATION IS 10 TO 12 INCHES, MEAN ANNUAL AIR TEMPERATURE IS ABOUT 36°F., AND THE GROWING SEASON IS ABOUT 80 TO 90 DAYS. TYPICALLY, THE SURFACE LAYER IS BROWN SANDY LOAM ABOUT 3 INCHES THICK. THE SUBSOIL IS BROWN SANDY CLAY ABOUT 9 INCHES THICK AND IS UNDERLAIN BY SOFT ALKALINE SHALE AT A DEPTH OF 12 INCHES.

ESTIMATED SOIL PROPERTIES

FOOTNOTE

PROP	OEPTH (IN.)	USDA TEXTURE	UNIFIED	AASHO	FRACT. >3 IN. (PCT)	PERCENT OF MATERIAL LESS THAN 3 IN. PASSING SIEVE 4	10	40	200	LIQUID LIMIT	PLASTICITY INDEX
041	0-12	SC	CL	A-6, A-7	0	95-100	95-100	70-80	60-70	35-45	20-30
2	12+	WB									

PROP	DEPTH (IN.)	PERMEABILITY (IN/HR)	AVAILABLE WATER CAPACITY (IN/IN)	SOIL REACTION (pH)	SALINITY (MMHOS/CM)	SHRINK-SWELL POTENTIAL	CORROSIVITY STEEL	CORROSIVITY CONCRETE	EROSION FACTORS K	EROSION FACTORS T	WIND EROD. GROUP
051	SAME DEPTH AS ABOVE	.06-.20	.07-.08	7.4->9.0	4.0-8.0	HIGH	HIGH	MODERATE	.20	1	3

PROP	FLOODING FREQUENCY	FLOODING DURATION	FLOODING MONTHS	HIGH WATER TABLE OEPTH (FT)	HIGH WATER TABLE KIND	HIGH WATER TABLE MONTHS	CEMENTED PAN DEPTH (IN)	CEMENTED PAN HARDNESS	BEDROCK OEPTH (IN)	BEDROCK HARDNESS	SUBSIDENCE INITIAL (IN)	SUBSIDENCE TOTAL (IN)	HYD GRP	POTENTIAL FROST ACTION
061	NONE			>6			--		10-20	RIPPABLE	--		D	LOW

SANITARY FACILITIES

FOOTNOTES

SEPTIC 071	SEPTIC TANK ABSORPTION FIELDS	10-15%: SEVERE - OEPTH TO ROCK, PERCS SLOWLY 15+%: SEVERE - SLOPE, DEPTH TO ROCK, PERCS SLOWLY
LAGOON 081	SEWAGE LAGOONS	SEVERE - SLOPE, DEPTH TO ROCK
TRENCH 091	SANITARY LANDFILL (TRENCH)	10-25%: SEVERE - DEPTH TO ROCK 25+%: SEVERE - SLOPE, DEPTH TO ROCK
SANARE 101	SANITARY LANDFILL (AREA)	10-15%: MODERATE - SLOPE 15+%: SEVERE - SLOPE
COVER 111	DAILY COVER FOR LANDFILL	10-15%: POOR - THIN LAYER 15+%: POOR - SLOPE, THIN LAYER

COMMUNITY DEVELOPMENT

FOOTNOTES

EXCAV 121	SHALLOW EXCAVATIONS	10-15%: SEVERE - DEPTH TO ROCK 15+%: SEVERE - SLOPE, DEPTH TO ROCK
DWEL 131	DWELLINGS WITHOUT BASEMENTS	10-15%: SEVERE - DEPTH TO ROCK, SHRINK-SWELL 15+%: SEVERE - SLOPE, DEPTH TO ROCK, SHRINK-SWELL
DWEL 141	DWELLINGS WITH BASEMENTS	10-15%: SEVERE - DEPTH TO ROCK, SHRINK-SWELL 15+%: SEVERE - SLOPE, DEPTH TO ROCK, SHRINK-SWELL
BLDGS 151	SMALL COMMERCIAL BUILDINGS	SEVERE - SLOPE, DEPTH TO ROCK, SHRINK-SWELL
ROADS 161	LOCAL ROADS AND STREETS	10-15%: SEVERE - DEPTH TO ROCK, SHRINK-SWELL, LOW STRENGTH 15+%: SEVERE - SLOPE, DEPTH TO ROCK, SHRINK-SWELL, LOW STRENGTH

REGIONAL INTERPRETATIONS

FOOTNOTES

REGION 171
REGION 181

SOURCE MATERIAL

FOOTNOTES

KEYING ONLY		
FILL 191	ROADFILL	10-25%: POOR - SHRINK-SWELL, THIN LAYER 25+%: POOR - SLOPE, SHRINK-SWELL, THIN LAYER
SAND 201	SAND	UNSUITED
GRAVEL 211	GRAVEL	UNSUITED
SOIL 221	TOPSOIL	10-15%: POOR - EXCESS ALKALI, THIN LAYER 15+%: POOR - SLOPE, EXCESS ALKALI, THIN LAYER

WATER MANAGEMENT

FOOTNOTES

PONDRS 231	POND RESERVOIR AREA	DEPTH TO ROCK, SLOPE
DIKES 241	EMBANKMENTS DIKES AND LEVEES	THIN LAYER, UNSTABLE FILL
PONDAQ 251	EXCAVATED PONDS AQUIFER FED	NO WATER
DRAIN 261	DRAINAGE	EXCESS ALKALI, DEPTH TO ROCK, PERCS SLOWLY
IRRIG 271	IRRIGATION	ROOTING DEPTH, SLOPE, EXCESS ALKALI
TERRAC 281	TERRACES AND DIVERSIONS	--
WATERW 291	GRASSED WATERWAYS	--

KEYING ONLY — RECORD NO. / CONTROL WORD / NO.

UNIT NAME: RALLOD
UNIT MODIFIER:

RECREATION

KEYING ONLY	NO.		FOOTNOTE	KEYING ONLY	NO.		FOOTNOTE
CAMPS	301	CAMP AREAS	1 10–15%: MODERATE – SLOPE 15+%: SEVERE – SLOPE	PLAYGD	321	PLAYGROUNDS	1 SEVERE – SLOPE, DEPTH TO ROCK
PICNIC	311	PICNIC AREAS	1 10–15%: MODERATE – SLOPE 15+%: SEVERE – SLOPE	PATHS	331	PATHS AND TRAILS	1 10–15%: SLIGHT 15–25%: MODERATE – SLOPE 25+%: SEVERE – SLOPE

CAPABILITY AND PREDICTED YIELDS - CROPS AND PASTURE (HIGH LEVEL MANAGEMENT)

FOOTNOTE

CRDPHD	NO.	CLASS-DETERMINING PHASE	CAPABILITY NIRR	CAPABILITY IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.
CRDPS	341	ALL	7E	--																
	351																			

WOODLAND SUITABILITY

FOOTNOTE

WODDS	NO.	CLASS-DETERMINING PHASE	ORD SYM	MANAGEMENT PROBLEMS: EROSION HAZARD	EQUIP. LIMIT	SEEDLING MORT'Y.	WINDTH. HAZARD	PLANT COMPET.	POTENTIAL PRODUCTIVITY: IMPORTANT TREES	SITE INDEX	TREES TO PLANT
	361	NONE							NONE		
	371										

WIND BREAKS

FOOTNOTE

WINDBK	NO.	CLASS-DETERMINING PHASE	SPECIES	HT	SPECIES	HT	SPECIES	HT	SPECIES	HT
	381	NONE								

WILDLIFE HABITAT SUITABILITY

FOOTNOTE

WILDLF	NO.	CLASS-DETERMINING PHASE	POTENTIAL FOR HABITAT ELEMENTS: GRAIN & SEED	GRASS & LEGUME	WILD HERB.	HARDWD TREES	CONIFER PLANTS	SHRUBS	WETLAND PLANTS	SHALLOW WATER	POTENTIAL AS HABITAT FOR: OPENLAND WILDLIFE	WOODLAND WILDLIFE	WETLAND WILDLIFE	RANGELAND WILDLIFE
	391	ALL	V. POOR	V. POOR	POOR	--	--	POOR	V. POOR	V. POOR	V. POOR	--	V. POOR	POOR

POTENTIAL NATIVE PLANT COMMUNITY (RANGELAND OR FOREST UNDERSTORY VEGETATION)

FOOTNOTE

PHASE	NO.	COMMON PLANT NAME	PLANT SYMBOL (NLSPN)	PERCENTAGE COMPOSITION (DRY WEIGHT) BY CLASS DETERMINING PHASE
PLANT	411	THICKSPIKE WHEATGRASS	AGOA	40
	2	INDIAN RICEGRASS	ORHY	10
	3	WINTERFAT	EUROT	10
	4	BOTTLEBRUSH SQUIRRELTAIL	SIHY	5
	5	MUTTON BLUEGRASS	POFE	5
	6	GARDNER SALTBUSH	ATNU2	5
	7	NEEDLELEAF SEDGE	CAEL2	5
	8	SANDBERG BLUEGRASS	POSE	5
	9	LOW RABBITBRUSH	CHVIH2	5
	421	LOW SAGEBRUSH	ARAR8	5
	2		OTHER	5

PRDDUC	NO.	POTENTIAL PRODUCTION (LBS./AC. ORY WT):	
	431	FAVORABLE YEARS	1,000
	2	NORMAL YEARS	750
	3	UNFAVORABLE YEARS	500

FOOTNOTES

NOTES	NO.	SYM.	
	441	1	WHERE SURFACE LAYER IS THIN, AREAS HAVE SEVERE LIMITATION--TOO CLAYEY.

SCS-SOILS-5
REV. MAY 1972
FILE CODE SOILS-12

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

SOIL SURVEY INTERPRETATIONS

KEYING ONLY — RECORD NO. | CONTROL WORD | NO.
MLRA | 001
STATE | 011

MLRA(S): 34 | KIND OF UNIT: SERIES | UNIT NAME: RELSOB
STATE: WYOMING | RECORD NO.: | AUTHOR(S): JRS | DATE: 2/73 | REVISED: | UNIT MODIFIER:

CLASSIFICATION AND BRIEF SOIL DESCRIPTION

CLASS 021: BOROLLIC HAPLARGIDS, FINE-LOAMY OVER SANDY OR SANDY-SKELETAL, MIXED.

DESCR 031: THE RELSOB SERIES ARE WELL DRAINED SOILS FORMED IN ALLUVIUM ON ALLUVIAL FANS. SLOPES ARE 3 TO 10 PERCENT. ELEVATION IS 7,000 TO 7,300 FEET. PRECIPITATION IS 10 TO 12 INCHES, MEAN ANNUAL AIR TEMPERATURE IS ABOUT 36°F., AND THE GROWING SEASON IS ABOUT 80 TO 90 DAYS. TYPICALLY, THE SURFACE LAYER IS PALE BROWN SANDY LOAM ABOUT 2 INCHES THICK. THE SUBSOIL IS PINKISH GRAY TO BROWN SANDY CLAY LOAM ABOUT 14 INCHES THICK. THE SUBSTRATUM IS YELLOWISH BROWN SANDY LOAM TO GRAYISH BROWN GRAVELLY SAND TO 60 INCHES OR MORE.

ESTIMATED SOIL PROPERTIES

	FOOTNOTE	DEPTH (IN.)	USDA TEXTURE	UNIFIED	AASHO	FRACT. >3 IN. (PCT)	PERCENT OF MATERIAL LESS THAN 3 IN. PASSING SIEVE 4	10	40	200	LIQUID LIMIT	PLASTICITY INDEX
PROP 041		0-24	SCL	SC, SM-SC	A-2	0	85-100	80-95	60-80	25-35	15-25	5-10
2		24-60	GR-S	SP-SM	A-2	0	50-60	40-50	20-35	5-10	0-5	NP
3												
4												
5												
6												

	DEPTH (IN.)	PERMEABILITY (IN/HR)	AVAILABLE WATER CAPACITY (IN/IN)	SOIL REACTION (pH)	SALINITY (MMHOS/CM)	SHRINK-SWELL POTENTIAL	CORROSIVITY STEEL	CORROSIVITY CONCRETE	EROSION FACTORS K	EROSION FACTORS T	WIND EROD. GROUP
PROP 051	SAME DEPTH AS ABOVE	.6-2.0	.14-.16	6.6-7.3	<2.0	LOW	HIGH	LOW	.28	5	5
2		6.0-20.0	.04-.06	6.6-7.3	<2.0	LOW	HIGH	LOW	.15	5	3
3											
4											
5											
6											

	FLOODING FREQUENCY	FLOODING DURATION	FLOODING MONTHS	HIGH WATER TABLE DEPTH (FT)	HIGH WATER TABLE KIND	HIGH WATER TABLE MONTHS	CEMENTED PAN DEPTH (IN)	CEMENTED PAN HARDNESS	BEDROCK DEPTH (IN)	BEDROCK HARDNESS	SUBSIDENCE INITIAL (IN)	SUBSIDENCE TOTAL (IN)	HYD GRP	POTENTIAL FROST ACTION
PROP 061	NONE			>6			--		>60		--		B	LOW

SANITARY FACILITIES

	FOOTNOTES		KEYING ONLY
SEPTIC 071	SEPTIC TANK ABSORPTION FIELDS	3-8%: SLIGHT 8+%: MOODERATE - SLOPE	FILL 191
LAGOON 081	SEWAGE LAGOONS	3-7%: SEVERE - PERCS RAPIDLY 7+%: SEVERE - SLOPE, PERCS RAPIDLY	SAND 201
TRENCH 091	SANITARY LANDFILL (TRENCH)	SEVERE - PERCS RAPIDLY, TOO SANDY	GRAVEL 211
SANARE 101	SANITARY LANDFILL (AREA)	SEVERE - PERCS RAPIDLY	SOIL 221
COVER 111	DAILY COVER FOR LANDFILL	POOR - TOO SANOY, SMALL STONES	

COMMUNITY DEVELOPMENT

	FOOTNOTES	
EXCAV 121	SHALLOW EXCAVATIONS	3-8%: MODERATE - SMALL STONES 8+%: MOODERATE - SLOPE, SMALL STONES
DWEL 131	DWELLINGS WITHOUT BASEMENTS	3-8%: SLIGHT 8+%: MODERATE - SLOPE
DWEL 141	DWELLINGS WITH BASEMENTS	3-8%: SLIGHT 8+%: MOODERATE - SLOPE
BLDGS 151	SMALL COMMERCIAL BUILDINGS	3-4%: SLIGHT 4-8%: MOODERATE - SLOPE 8+%: SEVERE - SLOPE
ROADS 161	LOCAL ROADS AND STREETS	3-8%: SLIGHT 8+%: FAIR - SLOPE

REGIONAL INTERPRETATIONS

	FOOTNOTES	
REGION 171		
REGION 181		

SOURCE MATERIAL

	FOOTNOTES	
ROADFILL 191		FAIR - LOW STRENGTH
SAND 201		FAIR
GRAVEL 211		FAIR
TOPSOIL 221		FAIR - TOO CLAYEY

WATER MANAGEMENT

	FOOTNOTES	
PONDRS 231	POND RESERVOIR AREA	PERCS RAPIDLY
DIKES 241	EMBANKMENTS DIKES AND LEVEES	PERCS RAPIDLY
PONDAQ 251	EXCAVATED PONDS AQUIFER FED	NO WATER
DRAIN 261	DRAINAGE	FAVORABLE
IRRIG 271	IRRIGATION	FAVORABLE
TERRAC 281	TERRACES AND DIVERSIONS	--
WATERW 291	GRASSED WATERWAYS	--

KEYING ONLY

UNIT NAME: RELSOB

UNIT MODIFIER:

RECREATION

RECORD NO.	CONTROL WORD	NO.		FOOTNOTE
	CAMPS	301	CAMP AREAS	3-8%: SLIGHT 8+%: MODERATE - SLOPE
		2		
		3		
		4		
		5		
	PICNIC	311	PICNIC AREAS	3-8%: SLIGHT 8+%: MODERATE - SLOPE
		2		
		3		
		4		
		5		

KEYING ONLY			FOOTNOTE
PLAYGD	321	PLAYGROUNDS	3-6%: MODERATE - SLOPE 6+%: SEVERE - SLOPE
	2		
	3		
	4		
	5		
PATHS	331	PATHS AND TRAILS	SLIGHT
	2		
	3		
	4		
	5		

CAPABILITY AND PREDICTED YIELDS - CROPS AND PASTURE (HIGH LEVEL MANAGEMENT)

			FOOTNOTE	CLASS-DETERMINING PHASE	CAPABILITY															
					NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.
	CRDPHD	451																		
		2																		
		3																		
	CRDPS	341		ALL	6E	--														
		2																		
		3																		
		4																		
		5																		
		6																		
		7																		
		8																		
		9																		
		351																		
		2																		
		3																		

WOODLAND SUITABILITY

			FOOTNOTE	CLASS-DETERMINING PHASE	ORO SYM	MANAGEMENT PROBLEMS					POTENTIAL PRODUCTIVITY		TREES TO PLANT
						EROSION HAZARD	EQUIP. LIMIT	SEEDLING MORT'Y.	WINDTH. HAZARD	PLANT COMPET.	IMPORTANT TREES	SITE INDEX	
	WDDDS	361		NONE							NONE		
		2											
		3											
		4											
		5											
		6											
		7											
		8											
		9											
		371											
		2											
		3											
		4											
		5											
		6											

WIND BREAKS

			FOOTNOTE	CLASS-DETERMINING PHASE	SPECIES	HT	SPECIES	HT	SPECIES	HT	SPECIES	HT
	WINDBK	381		NONE								
		2										
		3										
		4										
		5										
		6										

WILDLIFE HABITAT SUITABILITY

			FOOTNOTE	CLASS-DETERMINING PHASE	POTENTIAL FOR HABITAT ELEMENTS								POTENTIAL AS HABITAT FOR:			
					GRAIN & SEED	GRASS & LEGUME	WILD HERB.	HAROWD TREES	CONIFER PLANTS	SHRUBS	WETLAND PLANTS	SHALLOW WATER	OPENLAND WILDLIFE	WOODLAND WILDLIFE	WETLAND WILDLIFE	RANGELAND WILDLIFE
	WILDLF	391		ALL	FAIR	FAIR	FAIR	--	--	FAIR	POOR	POOR	FAIR	--	POOR	FAIR
		2														
		3														
		4														
		5														
		6														

POTENTIAL NATIVE PLANT COMMUNITY (RANGELAND OR FOREST UNDERSTORY VEGETATION)

			FOOTNOTE	COMMON PLANT NAME	PLANT SYMBOL (NLSPN)	PERCENTAGE COMPOSITION (DRY WEIGHT) BY CLASS DETERMINING PHASE				
	PHASE	401								
		2								
	PLANT	411		THICKSPIKE WHEATGRASS	AGDA	20				
		2		NEEDLEANDTHREAD	STCO4	15				
		3		BIG SAGEBRUSH	ARTR2	15				
		4		BLUEBUNCH WHEATGRASS	AGSP	10				
		5		CANBY BLUEGRASS	POCA	10				
		6		LETTERMAN NEEDLEGRASS	STLE4	10				
		7		INDIAN RICEGRASS	ORHY	5				
		8		PRAIRIE JUNEGRASS	KOCR	5				
		9			OTHER	10				
		421								
		2								
		3								
		4								
		5								
		6								

	PRDOUC	431	POTENTIAL PRODUCTION (LBS./AC. DRY WT):		
		2	FAVORABLE YEARS	1,500	
		3	NORMAL YEARS	1,200	
			UNFAVORABLE YEARS	700	

			SYM.	FOOTNOTES
	NOTES	441		
		2		
		3		
		4		
		5		
		6		
		7		

SCS-SOILS-5
REV. MAY 1972
FILE CODE SOILS-12

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

SOIL SURVEY INTERPRETATIONS

KEYING ONLY — RECORD NO. | CONTROL WORD | CONTROL NO.

MLRA(S): 34 | KIND OF UNIT: SERIES | UNIT NAME: RYARK
STATE: WYOMING | RECORD NO.: | AUTHOR(S): JRS | DATE: 2/73 | REVISED: | UNIT MODIFIER:

CLASSIFICATION AND BRIEF SOIL DESCRIPTION

CLASS 021: BOROLLIC HAPLARGIDS, COARSE-LOAMY, MIXED

DESCR 031: THE RYARK SERIES ARE WELL DRAINED SOILS FORMED IN SANDY ALLUVIUM ON ALLUVIAL FANS. SLOPES ARE 3 TO 10 PERCENT. ELEVATION IS 7,000 TO 7,300 FEET. PRECIPITATION IS 10 TO 12 INCHES, MEAN ANNUAL AIR TEMPERATURE IS ABOUT 36°F., AND THE GROWING SEASON IS ABOUT 80 TO 90 DAYS. TYPICALLY, THE SURFACE LAYER IS BROWN LOAMY SAND ABOUT 2 INCHES THICK. THE SUBSOIL IS BROWN SANDY LOAM ABOUT 16 INCHES THICK. THE UPPER PART OF THE SUBSTRATUM IS GRAYISH BROWN LOAMY SAND ABOUT 12 INCHES THICK. THE LOWER PART OF THE SUBSTRATUM IS LIGHT BROWNISH GRAY GRAVELLY SAND TO 60 INCHES OR MORE.

ESTIMATED SOIL PROPERTIES

	FOOTNOTE	DEPTH (IN.)	USDA TEXTURE	UNIFIED	AASHO	FRACT. >3 IN. (PCT)	PERCENT OF MATERIAL LESS THAN 3 IN. PASSING SIEVE 4	10	40	200	LIQUID LIMIT	PLASTICITY INDEX
PROP 041	1	0-18	SL	SC, SM-SC	A-2	0	85-100	80-100	50-70	20-35	15-25	5-10
	2	18-60	GRF-S	SP-SM	A-1	0	60-75	55-70	30-50	5-10	0	NP
	3											
	4											
	5											
	6											

	DEPTH (IN.)	PERMEABILITY (IN/HR)	AVAILABLE WATER CAPACITY (IN/IN)	SOIL REACTION (PH)	SALINITY (MMHOS/CM)	SHRINK-SWELL POTENTIAL	CORROSIVITY STEEL	CORROSIVITY CONCRETE	EROSION FACTORS K	EROSION FACTORS T	WIND EROD. GROUP
PROP 051	SAME DEPTH AS ABOVE	2.0-6.0	.11-.13	6.6-7.3	<2.0	LOW	HIGH	LOW	.20	5	3
2		6.0-20.0	.04-.06	6.6-7.3	<2.0	LOW	HIGH	LOW	.15	5	3
3											
4											
5											
6											

	FLOODING FREQUENCY	FLOODING DURATION	FLOODING MONTHS	HIGH WATER TABLE DEPTH (FT)	HIGH WATER TABLE KIND	HIGH WATER TABLE MONTHS	CEMENTED PAN DEPTH (IN)	CEMENTED PAN HARDNESS	BEDROCK DEPTH (IN)	BEDROCK HARDNESS	SUBSIDENCE INITIAL (IN)	SUBSIDENCE TOTAL (IN)	HYD GRP	POTENTIAL FROST ACTION
PROP 061	NONE			>6			--		>60		--		A	LOW

SANITARY FACILITIES

	FOOTNOTES	
SEPTIC 071	SEPTIC TANK ABSORPTION FIELDS	3-8%: SLIGHT 8+%: MODERATE - SLOPE
LAGOON 081	SEWAGE LAGOONS	3-7%: SEVERE - PERCS RAPIDLY 7+%: SEVERE - SLOPE, PERCS RAPIDLY
TRENCH 091	SANITARY LANDFILL (TRENCH)	SEVERE - PERCS RAPIDLY, TOO SANDY
SANARE 101	SANITARY LANDFILL (AREA)	SEVERE - PERCS RAPIDLY
COVER 111	DAILY COVER FOR LANDFILL	POOR - SMALL STONES, TOO SANDY

COMMUNITY DEVELOPMENT

	FOOTNOTES	
EXCAV 121	SHALLOW EXCAVATIONS	3-8%: MODERATE - SMALL STONES 8+%: MODERATE - SLOPE, SMALL STONES
DWEL 131	DWELLINGS WITHOUT BASEMENTS	3-8%: SLIGHT 8+%: MODERATE - SLOPE
DWEL 141	DWELLINGS WITH BASEMENTS	3-8%: SLIGHT 8+%: MODERATE - SLOPE
BLDGS 151	SMALL COMMERCIAL BUILDINGS	3-4%: SLIGHT 4-8%: MODERATE - SLOPE 8+%: SEVERE - SLOPE
ROADS 161	LOCAL ROADS AND STREETS	3-8%: SLIGHT 8+%: MODERATE - SLOPE

REGIONAL INTERPRETATIONS

	FOOTNOTES	
REGION 171		
REGION 181		

SOURCE MATERIAL

KEYING ONLY	FOOTNOTES	
FILL 191	ROADFILL	GOOD
SAND 201	SAND	FAIR
GRAVEL 211	GRAVEL	POOR
SOIL 221	TOPSOIL	3-8%: GOOD 8+%: FAIR - SLOPE

WATER MANAGEMENT

	FOOTNOTES	
PONDRS 231	POND RESERVOIR AREA	PERCS RAPIDLY
DIKES 241	EMBANKMENTS DIKES AND LEVEES	PERCS RAPIDLY, HARD TO PACK
PONDAQ 251	EXCAVATED PONDS AQUIFER FED	NO WATER
DRAIN 261	ORAINAGE	FAVORABLE
IRRIG 271	IRRIGATION	ERODES EASILY, FAST INTAKE
TERRAC 281	TERRACES AND DIVERSIONS	--
WATERW 291	GRASSED WATERWAYS	--

KEYING ONLY — RECORD NO. / CONTROL WORD / NO.

UNIT NAME: RYARK
UNIT MODIFIER:

(2)

RECREATION

KEYING ONLY	NO.		FOOTNOTE
CAMPS	301	CAMP AREAS	3-8%: SLIGHT 8+%: MODERATE - SLOPE
PICNIC	311	PICNIC AREAS	3-8%: SLIGHT 8+%: MODERATE - SLOPE
PLAYGD	321	PLAYGROUNDS	3-6%: MODERATE - SLOPE 6+%: SEVERE - SLOPE
PATHS	331	PATHS AND TRAILS	SLIGHT

CAPABILITY AND PREDICTED YIELDS - CROPS AND PASTURE (HIGH LEVEL MANAGEMENT)

CRDPHD 451 / CRDPS 341

FOOTNOTE	CLASS-DETERMINING PHASE	CAPABILITY															
		NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.
	ALL	6E	--														

WOODLAND SUITABILITY

WDDDS 361 / 371

FOOTNOTE	CLASS-DETERMINING PHASE	ORD SYM	MANAGEMENT PROBLEMS: ERDSION HAZARD	EQUIP. LIMIT	SEEDLING MORT'Y.	WINDTH. HAZARD	PLANT COMPET.	POTENTIAL PRODUCTIVITY: IMPORTANT TREES	SITE INDEX	TREES TO PLANT
	NONE							NONE		

WIND BREAKS

WINDBK 381

FOOTNOTE	CLASS-DETERMINING PHASE	SPECIES	HT	SPECIES	HT	SPECIES	HT	SPECIES	HT
	NONE								

WILDLIFE HABITAT SUITABILITY

WILDLF 391

FOOTNOTE	CLASS-DETERMINING PHASE	POTENTIAL FOR HABITAT ELEMENTS: GRAIN & SEED	GRASS & LEGUME	WILD HERB.	HARDWD TREES	CONIFER PLANTS	SHRUBS	WETLAND PLANTS	SHALLOW WATER	POTENTIAL AS HABITAT FOR: OPENLAND WILDLIFE	WOODLAND WILDLIFE	WETLAND WILDLIFE	RANGELAND WILDLIFE
	ALL	FAIR	FAIR	FAIR	--	--	FAIR	POOR	POOR	FAIR	--	POOR	FAIR

POTENTIAL NATIVE PLANT COMMUNITY (RANGELAND OR FOREST UNDERSTORY VEGETATION)

PHASE 401 / PLANT 411 / PRDDUC 431

FOOTNOTE	COMMON PLANT NAME	PLANT SYMBOL (NLSPN)	PERCENTAGE COMPOSITION (DRY WEIGHT) BY CLASS DETERMINING PHASE
	NEEDLEANOTHREAO	STCO4	25
	THICKSPIKE WHEATGRASS	AGDA	15
	INDIAN RICEGRASS	ORHY	10
	BLUEBUNCH WHEATGRASS	AGSP	10
	CANBY BLUEGRASS	POCA	10
	BIG SAGEBRUSH	ARTR2	10
	BOTTLEBRUSH SQUIRRELTAIL	SIHY	5
	LOW RABBITBRUSH	CHVIH2	5
		OTHER	10
	POTENTIAL PRODUCTION (LBS./AC. DRY WT): FAVORABLE YEARS		1,500
	NORMAL YEARS		1,200
	UNFAVORABLE YEARS		700

FOOTNOTES

NDTES 441

SYM.

SOIL SURVEY INTERPRETATIONS

KEYING ONLY — RECORD NO. | CONTROL WORD | NO.

MLRA(S) 34 — KIND OF UNIT SERIES — UNIT NAME TIGON

STATE WYOMING — RECORD NO. — AUTHOR(S) JRS — DATE 2/73 — REVISED — UNIT MODIFIER

CLASSIFICATION AND BRIEF SOIL DESCRIPTION

CLASS 021: BOROLLIC HAPLARGIDS, LOAMY, MIXED, SHALLOW

DESCR 031: THE TIGON SERIES ARE WELL DRAINED SOILS FORMED IN RESIDUUM FROM CEMENTED, ARKOSIC SAND AND VERY FINE GRAVEL ON RIDGES AND UPPER SIDEHILLS. SLOPES ARE 6 TO 30 PERCENT. ELEVATION IS 7,000 TO 7,300 FEET. PRECIPITATION IS 10 TO 12 INCHES, MEAN ANNUAL AIR TEMPERATURE IS ABOUT 36°F., AND THE GROWING SEASON IS ABOUT 80 TO 90 DAYS. TYPICALLY, THE SURFACE LAYER IS BROWN SANDY LOAM ABOUT 2 INCHES THICK. THE SUBSOIL IS BROWN SANDY CLAY LOAM ABOUT 13 INCHES THICK AND IS UNDERLAIN BY CEMENTED, NONCALCAREOUS, ARKOSIC SAND AND VERY FINE GRAVEL AT A DEPTH OF 15 INCHES.

ESTIMATED SOIL PROPERTIES

	FOOTNOTE	DEPTH (IN.)	USDA TEXTURE	UNIFIED	AASHO	FRACT. >3 IN. (PCT)	PERCENT OF MATERIAL LESS THAN 3 IN. PASSING SIEVE 4	10	40	200	LIQUID LIMIT	PLASTICITY INDEX
PROP 041		0-15	SCL	SC, SM-SC	A-2, A-6	0-5	75-90	70-85	55-70	25-45	20-30	5-15
2		15+	WB	--	--	--	--	--	--	--	--	--

	DEPTH (IN.)	PERMEABILITY (IN/HR)	AVAILABLE WATER CAPACITY (IN/IN)	SOIL REACTION (pH)	SALINITY (MMHOS/CM)	SHRINK-SWELL POTENTIAL	CORROSIVITY STEEL	CORROSIVITY CONCRETE	EROSION FACTORS K	EROSION FACTORS T	WIND EROD. GROUP
PROP 051	SAME DEPTH AS ABOVE	.6-2.0	.14-.16	6.6-7.3	<2.0	MODERATE	HIGH	LOW	.20	1	3

	FLOODING FREQUENCY	FLOODING DURATION	FLOODING MONTHS	HIGH WATER TABLE DEPTH (FT)	HIGH WATER TABLE KIND	HIGH WATER TABLE MONTHS	CEMENTED PAN DEPTH (IN)	CEMENTED PAN HARDNESS	BEDROCK DEPTH (IN)	BEDROCK HARDNESS	SUBSIDENCE INITIAL (IN)	SUBSIDENCE TOTAL (IN)	HYD GRP	POTENTIAL FROST ACTION
PROP 061	NONE			>6			--		10-20	RIPPABLE	--		C	LOW

SANITARY FACILITIES

	FOOTNOTES	
SEPTIC 071	SEPTIC TANK ABSORPTION FIELDS	6-15%: SEVERE - DEPTH TO ROCK 15+%: SEVERE - SLOPE, DEPTH TO ROCK
LAGOON 081	SEWAGE LAGOONS	6-7%: SEVERE - DEPTH TO ROCK 7+%: SEVERE - SLOPE, DEPTH TO ROCK
TRENCH 091	SANITARY LANDFILL (TRENCH)	6-25%: SEVERE - DEPTH TO ROCK 25+%: SEVERE - SLOPE, DEPTH TO ROCK
SANARE 101	SANITARY LANDFILL (AREA)	6-15%: MODERATE - SLOPE 15+%: SEVERE - SLOPE
COVER 111	DAILY COVER FOR LANDFILL	6-15%: POOR - THIN LAYER 15+%: POOR - SLOPE, THIN LAYER

COMMUNITY DEVELOPMENT

	FOOTNOTES	
EXCAV 121	SHALLOW EXCAVATIONS	6-15%: SEVERE - DEPTH TO ROCK 15+%: SEVERE - SLOPE, DEPTH TO ROCK
DWEL 131	DWELLINGS WITHOUT BASEMENTS	6-15%: SEVERE - DEPTH TO ROCK 15+%: SEVERE - SLOPE, DEPTH TO ROCK
DWEL 141	DWELLINGS WITH BASEMENTS	6-15%: SEVERE - DEPTH TO ROCK 15+%: SEVERE - SLOPE, DEPTH TO ROCK
BLDGS 151	SMALL COMMERCIAL BUILDINGS	6-8%: SEVERE - DEPTH TO ROCK 8+%: SEVERE - SLOPE, DEPTH TO ROCK
ROADS 161	LOCAL ROADS AND STREETS	6-15%: MODERATE - DEPTH TO ROCK 15+%: SEVERE - SLOPE

REGIONAL INTERPRETATIONS

	FOOTNOTES	
REGION 171		
REGION 181		

SOURCE MATERIAL

KEYING ONLY	FOOTNOTES	
FILL 191	ROADFILL	POOR - THIN LAYER
SAND 201	SAND	UNSUITED
GRAVEL 211	GRAVEL	UNSUITED
SOIL 221	TOPSOIL	POOR - THIN LAYER

WATER MANAGEMENT

	FOOTNOTES	
PONDRS 231	POND RESERVOIR AREA	DEPTH TO ROCK, SLOPE
DIKES 241	EMBANKMENTS DIKES AND LEVEES	THIN LAYER
PONDAQ 251	EXCAVATED PONDS AQUIFER FED	NO WATER
DRAIN 261	DRAINAGE	DEPTH TO ROCK
IRRIG 271	IRRIGATION	SLOPE, ROOTING DEPTH
TERRAC 281	TERRACES AND DIVERSIONS	--
WATERW 291	GRASSED WATERWAYS	--

KEYING ONLY — RECORD NO. / CONTROL WORD / NO.

UNIT NAME: TIGON
UNIT MODIFIER:

RECREATION

KEYING ONLY		FOOTNOTE	KEYING ONLY		FOOTNOTE
CAMPS	301	6-8%: SLIGHT	PLAYGD	321	SEVERE - SLOPE, DEPTH TO ROCK
	2	8-15%: MODERATE - SLOPE		2	
CAMP AREAS	3	15+%: SEVERE - SLOPE	PLAYGROUNDS	3	
	4			4	
	5			5	
PICNIC	311	6-8%: SLIGHT	PATHS	331	6-15%: SLIGHT
	2	8-15%: MODERATE - SLOPE		2	15-25%: MODERATE - SLOPE
PICNIC AREAS	3	15+%: SEVERE - SLOPE	PATHS AND TRAILS	3	25+%: SEVERE - SLOPE
	4			4	
	5			5	

CAPABILITY AND PREDICTED YIELDS - CROPS AND PASTURE (HIGH LEVEL MANAGEMENT)

FOOTNOTE

CROPHD 451	CLASS-DETERMINING PHASE	CAPABILITY															
		NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.
CROPS 341	ALL	7E	--														
2																	
3																	
4																	
5																	
6																	
7																	
8																	
9																	
351																	
2																	
3																	

WOODLAND SUITABILITY

FOOTNOTE

WOODS 361	CLASS-DETERMINING PHASE	ORD SYM	MANAGEMENT PROBLEMS					POTENTIAL PRODUCTIVITY		TREES TO PLANT
			EROSION HAZARD	EQUIP. LIMIT	SEEDLING MORT'Y.	WINDTH. HAZARD	PLANT COMPET.	IMPORTANT TREES	SITE INDEX	
	NONE							NONE		
2										
3										
4										
5										
6										
7										
8										
9										
371										
2										
3										
4										
5										
6										

WIND BREAKS

FOOTNOTE

WINDBK 381	CLASS-DETERMINING PHASE	SPECIES	HT	SPECIES	HT	SPECIES	HT	SPECIES	HT
	NONE								
2									
3									
4									
5									
6									

WILDLIFE HABITAT SUITABILITY

FOOTNOTE

WILDLF 391	CLASS-DETERMINING PHASE	POTENTIAL FOR HABITAT ELEMENTS								POTENTIAL AS HABITAT FOR:			
		GRAIN & SEED	GRASS & LEGUME	WILD HERB.	HARDWD TREES	CONIFER PLANTS	SHRUBS	WETLAND PLANTS	SHALLOW WATER	OPENLAND WILDLIFE	WOODLAND WILDLIFE	WETLAND WILDLIFE	RANGELAND WILDLIFE
	ALL	V. POOR	V. POOR	POOR	--	--	POOR	V. POOR	V. POOR	V. POOR	--	V. POOR	POOR
2													
3													
4													
5													
6													

POTENTIAL NATIVE PLANT COMMUNITY (RANGELAND OR FOREST UNDERSTORY VEGETATION)

FOOTNOTE

PHASE 401	COMMON PLANT NAME	PLANT SYMBOL (NLSPN)	PERCENTAGE COMPOSITION (DRY WEIGHT) BY CLASS DETERMINING PHASE				
2							
PLANT 411	BLUEBUNCH WHEATGRASS	AGSP	20				
2	THICKSPIKE WHEATGRASS	AGDA	15				
3	INDIAN RICEGRASS	ORHY	10				
4	NEEDLEANDTHREAD	STCO4	10				
5	LETTERMAN NEEDLEGRASS	STLE4	5				
6	NEEDLELEAF SEDGE	CAEL2	5				
7	SANDBERG BLUEGRASS	POSE	5				
8	BIG SAGEBRUSH	ARTR2	5				
9	LOW RABBITBRUSH	CHVIH2	5				
421	BITTERBRUSH	PURSH	5				
2		OTHER	15				
3							
4							
5							
6							

PRODUC 431	POTENTIAL PRODUCTION (LBS./AC. DRY WT):	
2	FAVORABLE YEARS	1,200
3	NORMAL YEARS	900
	UNFAVORABLE YEARS	700

FOOTNOTES

NOTES 441	SYM.	
2		
3		
4		
5		
6		
7		

SCS-SOILS-5
REV. MAY 1972
FILE CODE SOILS-12

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

SOIL SURVEY INTERPRETATIONS

KEYING ONLY — RECORD NO. | CONTROL WORD | NO.

MLRA | 001
STATE | 011

MLRA(S): 34 | KIND OF UNIT: SERIES | UNIT NAME: TRESANO
STATE: WYOMING | RECORD NO. | AUTHOR(S): JRS | DATE: 2/73 | REVISED | UNIT MODIFIER

CLASSIFICATION AND BRIEF SOIL DESCRIPTION

CLASS 021: TYPIC HAPLARGIDS, FINE, LOAMY, MIXED, FRIGID

DESCR 031: THE TRESANO SERIES ARE WELL DRAINED SOILS FORMED IN MIXED ALLUVIUM ON ALLUVIAL FANS. SLOPES ARE 6 TO 10 PERCENT. ELEVATION IS 6,800 TO 7,000 FEET. PRECIPITATION IS 7 TO 9 INCHES, MEAN ANNUAL AIR TEMPERATURE IS ABOUT 36°F., AND THE GROWING SEASON IS ABOUT 80 TO 90 DAYS. TYPICALLY, THE SURFACE LAYER IS GRAYISH BROWN SANDY LOAM ABOUT 7 INCHES THICK. THE SUBSOIL IS BROWN TO GRAYISH BROWN SANDY CLAY LOAM ABOUT 17 INCHES THICK. THE SUBSTRATUM IS GRAYISH BROWN SANDY CLAY LOAM TO 60 INCHES OR MORE.

ESTIMATED SOIL PROPERTIES

	FOOTNOTE	DEPTH (IN.)	USDA TEXTURE	UNIFIED	AASHO	FRACT. >3 IN. (PCT)	PERCENT OF MATERIAL LESS THAN 3 IN. PASSING SIEVE 4	10	40	200	LIQUID LIMIT	PLASTICITY INDEX
PROF 041		0-60	SCL	SC	A-2, A-6	0-5	80-100	75-90	60-70	25-50	20-30	10-20

	DEPTH (IN.)	PERMEABILITY (IN/HR)	AVAILABLE WATER CAPACITY (IN/IN)	SOIL REACTION (pH)	SALINITY (MMHOS/CM)	SHRINK-SWELL POTENTIAL	CORROSIVITY STEEL	CORROSIVITY CONCRETE	EROSION FACTORS K	EROSION FACTORS T	WIND EROD. GROUP
PROP 051	SAME DEPTH AS ABOVE	.6-2.0	.14-.16	7.4-9.0	2.0-4.0	MODERATE	HIGH	LOW	.20	5	3

	FLOODING FREQUENCY	FLOODING DURATION	FLOODING MONTHS	HIGH WATER TABLE DEPTH (FT)	HIGH WATER TABLE KIND	HIGH WATER TABLE MONTHS	CEMENTED PAN DEPTH (IN)	CEMENTED PAN HARDNESS	BEDROCK DEPTH (IN)	BEDROCK HARDNESS	SUBSIDENCE INITIAL (IN)	SUBSIDENCE TOTAL (IN)	HYD GRP	POTENTIAL FROST ACTION
PROP 061	NONE			>6			--		>60		--		B	LOW

SANITARY FACILITIES

	FOOTNOTES	
SEPTIC 071	SEPTIC TANK ABSORPTION FIELDS	MODERATE - PERCS SLOWLY
LAGOON 081	SEWAGE LAGOONS	6-7%: MODERATE - SLOPE 7+%: SEVERE - SLOPE
TRENCH 091	SANITARY LANDFILL (TRENCH)	SLIGHT
SANARE 101	SANITARY LANDFILL (AREA)	6-8%: SLIGHT 8+%: MODERATE - SLOPE
COVER 111	DAILY COVER FOR LANDFILL	6-8%: GOOD 8+%: FAIR - SLOPE

COMMUNITY DEVELOPMENT

	FOOTNOTES	
EXCAV 121	SHALLOW EXCAVATIONS	6-8%: SLIGHT 8+%: MODERATE - SLOPE
DWEL 131	DWELLINGS WITHOUT BASEMENTS	MODERATE - SHRINK-SWELL
DWEL 141	DWELLINGS WITH BASEMENTS	MODERATE - SHRINK-SWELL, FROST ACTION
BLDGS 151	SMALL COMMERCIAL BUILDINGS	6-8%: MODERATE - SHRINK-SWELL, SLOPE, FROST ACTION 8+%: SEVERE - SLOPE
ROADS 161	LOCAL ROADS AND STREETS	6-8%: MODERATE - SHRINK-SWELL, LOW STRENGTH 8+%: MODERATE - SLOPE, SHRINK-SWELL, LOW STRENGTH

REGIONAL INTERPRETATIONS

	FOOTNOTES	
REGION 171		
REGION 181		

SOURCE MATERIAL

KEYING ONLY	FOOTNOTES	
FILL 191	ROADFILL	POOR - LOW STRENGTH, SHRINK-SWELL
SAND 201	SAND	UNSUITED
GRAVEL 211	GRAVEL	UNSUITED
SOIL 221	TOPSOIL	6-8%: FAIR - TOO CLAYEY 8+%: FAIR - SLOPE, TOO CLAYEY

WATER MANAGEMENT

	FOOTNOTES	
PONDRS 231	POND RESERVOIR AREA	SLOPE
DIKES 241	EMBANKMENTS DIKES AND LEVEES	LOW STRENGTH
PONDAQ 251	EXCAVATED PONDS AQUIFER FED	NO WATER
DRAIN 261	DRAINAGE	PERCS SLOWLY
IRRIG 271	IRRIGATION	SLOPE
TERRAC 281	TERRACES AND DIVERSIONS	--
WATERW 291	GRASSED WATERWAYS	--

KEYING ONLY — RECORD NO. | CONTROL WORD | NO.

UNIT NAME: TRESANO
UNIT MODIFIER:

	CONTROL WORD	NO.		FOOTNOTE
	CAMPS	301	CAMP AREAS	6-8%: SLIGHT 8+%: MODERATE - SLOPE
		2		
		3		
		4		
	▼	5		
	PICNIC	311	PICNIC AREAS	6-8%: SLIGHT 8+: MODERATE - SLOPE
		2		
		3		
		4		
	▼	5		

RECREATION

KEYING ONLY			FOOTNOTE
PLAYGD	321	PLAYGROUNDS	SEVERE - SLOPE
	2		
	3		
	4		
▼	5		
PATHS	331	PATHS AND TRAILS	SLIGHT
	2		
	3		
	4		
▼	5		

CAPABILITY AND PREDICTED YIELDS - CROPS AND PASTURE (HIGH LEVEL MANAGEMENT)

			FOOTNOTE	CLASS-DETERMINING PHASE	CAPABILITY NIRR	CAPABILITY IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.
	CROPHD	451																		
		2																		
	▼	3																		
	CROPS	341		ALL	6E	--														
		2																		
		3																		
		4																		
		5																		
		6																		
		7																		
		8																		
	▼	9																		
		351																		
		2																		
	▼	3																		

WOODLAND SUITABILITY

			FOOTNOTE	CLASS-DETERMINING PHASE	ORO SYM	MANAGEMENT PROBLEMS: EROSION HAZARD	EQUIP. LIMIT	SEEDLING MORT'Y.	WINDTH. HAZARD	PLANT COMPET.	POTENTIAL PRODUCTIVITY: IMPORTANT TREES	SITE INDEX	TREES TO PLANT
	WOODS	361		NONE							NONE		
		2											
		3											
		4											
		5											
		6											
		7											
		8											
	▼	9											
		371											
		2											
		3											
		4											
		5											
	▼	6											

WIND BREAKS

		FODTNOTE	CLASS-DETERMINING PHASE	SPECIES	HT	SPECIES	HT	SPECIES	HT	SPECIES	HT
	WINOBK 381		NONE								
	2										
	3										
	4										
	5										
	▼ 6										

WILDLIFE HABITAT SUITABILITY

		FOOTNOTE	CLASS-DETERMINING PHASE	POTENTIAL FOR HABITAT ELEMENTS: GRAIN & SEED	GRASS & LEGUME	WILD HERB.	HARDWD TREES	CONIFER PLANTS	SHRUBS	WETLAND PLANTS	SHALLOW WATER	POTENTIAL AS HABITAT FOR: OPENLAND WILDLIFE	WOODLAND WILDLIFE	WETLAND WILDLIFE	RANGELAND WILDLIFE
	WILDLF 391		ALL	POOR	POOR	FAIR	--	--	FAIR	POOR	POOR	POOR	--	POOR	FAIR
	2														
	3														
	4														
	5														
	▼ 6														

POTENTIAL NATIVE PLANT COMMUNITY (RANGELAND OR FOREST UNDERSTORY VEGETATION)

		FOOTNOTE	COMMON PLANT NAME	PLANT SYMBOL (NLSPN)	PERCENTAGE COMPOSITION (DRY WEIGHT) BY CLASS DETERMINING PHASE
	PHASE 401				
	▼ 2				
	PLANT 411		THICKSPIKE WHEATGRASS	AGDA	30
	2		NEEDLEANDTHREAD	STCO4	20
	3		INDIAN RICEGRASS	ORHY	10
	4		BIG SAGEBRUSH	ARTR2	10
	5		BLUEBUNCH WHEATGRASS	AGSP	5
	6		PRAIRIE JUNEGRASS	KOCR	5
	7		SANDBERG BLUEGRASS	POSE	5
	8		WINTERFAT	EUROT	5
	▼ 9		LOW RABBITBRUSH	CHVIH2	5
	421			OTHER	5
	2				
	3				
	4				
	5				
	▼ 6				
	PRODUC 431		POTENTIAL PRODUCTION (LBS./AC. DRY WT): FAVORABLE YEARS		700
	2		NORMAL YEARS		500
	▼ 3		UNFAVORABLE YEARS		300

	SYM.	FOOTNOTES
NOTES 441		
2		
3		
4		
5		
6		
▼ 7		

SCS-SOILS-5
REV. MAY 1972
FILE CODE SOILS-12

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

SOIL SURVEY INTERPRETATIONS

KEYING ONLY — RECORD NO. | CONTROL WORD | NO.

MLRA(S) 34 | KIND OF UNIT SERIES | UNIT NAME VIBLE

STATE WYOMING | RECORD NO. | AUTHOR(S) JRS | DATE 2/73 | REVISED | UNIT MODIFIER

CLASSIFICATION AND BRIEF SOIL DESCRIPTION

CLASS 021: USTIC TORRIORTHENTS, SANDY, MIXED, FRIGID

DESCR 031: THE VIBLE SERIES ARE WELL DRAINED SOILS FORMED IN SANDY ALLUVIUM ON ALLUVIAL FANS. SLOPES ARE 0 TO 3 PERCENT. ELEVATION IS 7,000 TO 7,300 FEET. PRECIPITATION IS 10 TO 12 INCHES, MEAN ANNUAL AIR TEMPERATURE IS ABOUT 36°F., AND THE GROWING SEASON IS ABOUT 80 TO 90 DAYS. TYPICALLY, THE SURFACE LAYER IS PALE BROWN SANDY LOAM ABOUT 3 INCHES. THE UNDERLYING LAYER IS YELLOWISH BROWN TO BROWN SANDY LOAM ABOUT 13 INCHES THICK. THE SUBSTRATUM IS PALE BROWN COARSE SAND TO 60 INCHES OR MORE.

ESTIMATED SOIL PROPERTIES

FOOTNOTE	DEPTH (IN.)	USDA TEXTURE	UNIFIED	AASHD	FRACT. >3 IN. (PCT)	PERCENT OF MATERIAL LESS THAN 3 IN. PASSING SIEVE 4	10	40	200	LIQUID LIMIT	PLASTICITY INDEX
PROP 041	0-16	SL	SM, SM-SC, SC	A-2	0-5	90-100	80-90	40-50	20-30	15-20	NP-10
2	16-60	COS	SP-SM	A-1	0-5	90-100	75-90	30-40	5-10	0	NP
3											
4											
5											
6											

	DEPTH (IN.)	PERMEABILITY (IN/HR)	AVAILABLE WATER CAPACITY (IN/IN)	SOIL REACTION (pH)	SALINITY (MMHOS/CM)	SHRINK-SWELL POTENTIAL	CORROSIVITY STEEL	CORROSIVITY CONCRETE	EROSION FACTORS K	EROSION FACTORS T	WIND ERDD. GROUP
PROP 051		2.0-6.0	.11-.13	6.6-7.3	<2.0	LOW	HIGH	LOW	.20	5	3
2	SAME DEPTH AS ABOVE	6.0-20.0	.04-.06	6.6-7.8	<2.0	LOW	HIGH	LOW	.15	5	3
3											
4											
5											
6											

	FLOODING FREQUENCY	FLOODING DURATION	FLOODING MONTHS	HIGH WATER TABLE DEPTH (FT)	HIGH WATER TABLE KIND	HIGH WATER TABLE MONTHS	CEMENTED PAN DEPTH (IN)	CEMENTED PAN HARDNESS	BEDROCK DEPTH (IN)	BEDROCK HARDNESS	SUBSIDENCE INITIAL (IN)	SUBSIDENCE TOTAL (IN)	HYD GRP	POTENTIAL FROST ACTION
PRDP 061	NONE			>6			--		>60		--		A	LOW

SANITARY FACILITIES

	FOOTNOTES	SANITARY FACILITIES
SEPTIC 071	SEPTIC TANK ABSORPTION FIELDS	SLIGHT
LAGOON 081	SEWAGE LAGOONS	SEVERE - PERCS RAPIDLY
TRENCH 091	SANITARY LANDFILL (TRENCH)	SEVERE - PERCS RAPIDLY
SANARE 101	SANITARY LANDFILL (AREA)	SEVERE - PERCS RAPIDLY
COVER 111	DAILY COVER FOR LANDFILL	POOR - TOO SANDY

COMMUNITY DEVELOPMENT

	FOOTNOTES	COMMUNITY DEVELOPMENT
EXCAV 121	SHALLOW EXCAVATIONS	SLIGHT
DWEL 131	DWELLINGS WITHOUT BASEMENTS	SLIGHT
DWEL 141	DWELLINGS WITH BASEMENTS	SLIGHT
BLDGS 151	SMALL COMMERCIAL BUILDINGS	SLIGHT
ROADS 161	LOCAL ROADS AND STREETS	SLIGHT

REGIONAL INTERPRETATIONS

	FOOTNOTES	
REGION 171		
REGION 181		

SOURCE MATERIAL

KEYING ONLY	FOOTNOTES	SOURCE MATERIAL
FILL 191	ROADFILL	GOOD
SAND 201	SAND	FAIR
GRAVEL 211	GRAVEL	FAIR
SOIL 221	TOPSOIL	FAIR - THIN LAYER

WATER MANAGEMENT

	FOOTNOTES	WATER MANAGEMENT
PONDRS 231	POND RESERVOIR AREA	PERCS RAPIDLY
DIKES 241	EMBANKMENTS DIKES AND LEVEES	PERCS RAPIDLY
PONDAQ 251	EXCAVATED PONDS AQUIFER FED	NO WATER
DRAIN 261	DRAINAGE	FAVORABLE
IRRIG 271	IRRIGATION	DROUGHTY, ERODES EASILY, FAST INTAKE
TERRAC 281	TERRACES AND DIVERSIONS	--
WATERW 291	GRASSED WATERWAYS	--

KEYING ONLY — RECORD NO. / CONTROL WORD / NO.

UNIT NAME: VIBLE
UNIT MODIFIER:

RECREATION

KEYING ONLY	CONTROL WORD	NO.	FOOTNOTE	
	CAMPS	301	SLIGHT	CAMP AREAS
		2		
		3		
		4		
	↓	↓ 5		
	PICNIC	311	SLIGHT	PICNIC AREAS
		2		
		3		
		4		
	↓	↓ 5		

KEYING ONLY	CONTROL WORD	NO.	FOOTNOTE	
	PLAYGD	321	0-2%: SLIGHT 3+%: MODERATE - SLOPE	PLAYGROUNDS
		2		
		3		
		4		
	↓	↓ 5		
	PATHS	331	SLIGHT	PATHS AND TRAILS
		2		
		3		
		4		
	↓	↓ 5		

CAPABILITY AND PREDICTED YIELDS - CROPS AND PASTURE (HIGH LEVEL MANAGEMENT)

			FOOTNOTE	CLASS-DETERMINING PHASE	CAPABILITY NIRR	CAPABILITY IRR.														
	CROPHO	451																		
		2																		
	↓	↓ 3																		
	CROPS	341		ALL	6E	--														
		2																		
		3																		
		4																		
		5																		
		6																		
		7																		
		8																		
		↓ 9																		
		351																		
		2																		
	↓	↓ 3																		

WOODLAND SUITABILITY

			FOOTNOTE	CLASS-DETERMINING PHASE	ORO SYM	MANAGEMENT PROBLEMS: EROSION HAZARD	EQUIP. LIMIT	SEEDLING MORT'Y.	WINDTH. HAZARD	PLANT COMPET.	POTENTIAL PRODUCTIVITY: IMPORTANT TREES	SITE INDEX	TREES TO PLANT
	WOODS	361		NONE							NONE		
		2											
		3											
		4											
		5											
		6											
		7											
		8											
		↓ 9											
		371											
		2											
		3											
		4											
		5											
	↓	↓ 6											

WIND BREAKS

			FOOTNOTE	CLASS-DETERMINING PHASE	SPECIES	HT	SPECIES	HT	SPECIES	HT	SPECIES	HT
	WINOBK	381		NONE								
		2										
		3										
		4										
		5										
	↓	↓ 6										

WILDLIFE HABITAT SUITABILITY

			FOOTNOTE	CLASS-DETERMINING PHASE	POTENTIAL FOR HABITAT ELEMENTS: GRAIN & SEED	GRASS & LEGUME	WILD HERB.	HARDWD TREES	CONIFER PLANTS	SHRUBS	WETLAND PLANTS	SHALLOW WATER	POTENTIAL AS HABITAT FOR: OPENLAND WILDLIFE	WOODLAND WILDLIFE	WETLAND WILDLIFE	RANGELAND WILDLIFE
	WILDLF	391		ALL	FAIR	FAIR	FAIR	--	--	FAIR	POOR	POOR	FAIR	--	POOR	FAIR
		2														
		3														
		4														
		5														
	↓	↓ 6														

POTENTIAL NATIVE PLANT COMMUNITY (RANGELAND OR FOREST UNDERSTORY VEGETATION)

			FOOTNOTE	COMMON PLANT NAME	PLANT SYMBOL (NLSPN)	PERCENTAGE COMPOSITION (DRY WEIGHT) BY CLASS DETERMINING PHASE
	PHASE	401				
	↓	↓ 2				
	PLANT	411		NEEDLEANDTHREAD	STCO4	25
		2		THICKSPIKE WHEATGRASS	AGDA	15
		3		INDIAN RICEGRASS	ORHY	10
		4		BLUEBUNCH WHEATGRASS	AGSP	10
		5		CANBY BLUEGRASS	POCA	10
		6		BIG SAGEBRUSH	ARTR2	10
		7		BOTTLEBRUSH SQUIRRELTAIL	SIHY	5
		8		LOW RABBITBRUSH	CHVIH2	5
		↓ 9			OTHER	10
		421				
		2				
		3				
		4				
		5				
	↓	↓ 6				

			POTENTIAL PRODUCTION (LBS./AC. ORY WT):	
	PRODUC	431	FAVORABLE YEARS	1,500
		2	NORMAL YEARS	1,200
	↓	↓ 3	UNFAVORABLE YEARS	700

			SYM.	FOOTNOTES
	NOTES	441		
		2		
		3		
		4		
		5		
		6		
	↓	↓ 7		

SOIL SURVEY INTERPRETATIONS

KEYING ONLY | RECORD NO. | CONTROL WORD | NO.

MLRA(S) 34 | KIND OF UNIT SERIES | UNIT NAME YOUJAY

STATE WYOMING | RECORD NO. | AUTHOR(S) JRS | DATE 2/73 | REVISED | UNIT MODIFIER

CLASSIFICATION AND BRIEF SOIL DESCRIPTION

CLASS 021 | DESCR 031

TYPIC NATRARGIDS, CLAYEY, MONTMORILLONITIC, FRIGID, SHALLOW

THE YOUJAY SERIES ARE WELL DRAINED SOILS FORMED IN RESIDUUM FROM STRONGLY ALKALINE SHALE ON RIDGES AND SIDEHILLS. SLOPES ARE 3 TO 30 PERCENT. ELEVATION IS 6,800 TO 7,000 FEET. PRECIPITATION IS 7 TO 9 INCHES, MEAN ANNUAL AIR TEMPERATURE IS ABOUT 36°F., AND THE GROWING SEASON IS ABOUT 80 TO 90 DAYS. TYPICALLY, THE SURFACE LAYER IS LIGHT GRAY SANDY LOAM ABOUT 1 INCH THICK. THE SUBSOIL IS BROWN TO LIGHT OLIVE BROWN CLAY LOAM ABOUT 13 INCHES THICK AND IS UNDERLAIN BY SOFT, STRONGLY ALKALINE SHALE AT A DEPTH OF 14 INCHES.

ESTIMATED SOIL PROPERTIES

	FODTNOTE DEPTH (IN.)	USDA TEXTURE	UNIFIED	AASHO	FRACT. >3 IN. (PCT)	PERCENT OF MATERIAL LESS THAN 3 IN. PASSING SIEVE 4	10	40	200	LIQUID LIMIT	PLASTICITY INDEX
PROP 041	0-14	CL	CL	A-6	0-5	95-100	95-100	85-95	55-65	30-40	15-25
2	14+	WB	--	--	--	--	--	--	--	--	--
3											
4											
5											
6											

	DEPTH (IN.)	PERMEABILITY (IN/HR)	AVAILABLE WATER CAPACITY (IN/IN)	SOIL REACTION (pH)	SALINITY (MMHOS/CM)	SHRINK-SWELL POTENTIAL	CORROSIVITY STEEL	CORROSIVITY CONCRETE	EROSION FACTORS K	EROSION FACTORS T	WIND EROD. GROUP
PROP 051	SAME DEPTH AS ABOVE	.20-.6	.09-.11	7.4->9.0	2.0-4.0	HIGH	HIGH	MODERATE	.37	1	4
2											
3											
4											
5											
6											

	FLOODING FREQUENCY	FLOODING DURATION	FLOODING MONTHS	HIGH WATER TABLE DEPTH (FT)	HIGH WATER TABLE KIND	HIGH WATER TABLE MONTHS	CEMENTED PAN DEPTH (IN)	CEMENTED PAN HARDNESS	BEDROCK DEPTH (IN)	BEDROCK HARDNESS	SUBSIDENCE INITIAL (IN)	SUBSIDENCE TOTAL (IN)	HYD GRP	POTENTIAL FROST ACTION
PROP 061	NONE			>6			--		10-20	RIPPABLE	--		D	LOW

SANITARY FACILITIES

	FOOTNOTES	
SEPTIC 071	SEPTIC TANK ABSORPTION FIELDS	3-15%: SEVERE - PERCS SLOWLY, DEPTH TO ROCK 15+%: SEVERE - SLOPE, PERCS SLOWLY, DEPTH TO ROCK
LAGOON 081	SEWAGE LAGOONS	3-7%: SEVERE - DEPTH TO ROCK 7+%: SEVERE - SLOPE, DEPTH TO ROCK
TRENCH 091	SANITARY LANDFILL (TRENCH)	3-25%: SEVERE - DEPTH TO ROCK 25+%: SEVERE - SLOPE, DEPTH TO ROCK
SANARE 101	SANITARY LANDFILL (AREA)	3-8%: SLIGHT 8-15%: MODERATE - SLOPE 15+%: SEVERE - SLOPE
COVER 111	DAILY COVER FOR LANDFILL	3-15%: POOR - THIN LAYER 15+%: POOR - SLOPE, THIN LAYER

COMMUNITY DEVELOPMENT

	FOOTNOTES	
EXCAV 121	SHALLOW EXCAVATIONS	3-15%: SEVERE - DEPTH TO ROCK 15+%: SEVERE - SLOPE, DEPTH TO ROCK
DWEL 131	DWELLINGS WITHOUT BASEMENTS	3-15%: SEVERE - DEPTH TO ROCK, SHRINK-SWELL, LOW STRENGTH 15+%: SEVERE - SLOPE, DEPTH TO ROCK, SHRINK-SWELL, LOW STRENGTH
DWEL 141	DWELLINGS WITH BASEMENTS	3-15%: SEVERE - DEPTH TO ROCK, SHRINK-SWELL, LOW STRENGTH 15+%: SEVERE - SLOPE, DEPTH TO ROCK, SHRINK-SWELL, LOW STRENGTH
BLDGS 151	SMALL COMMERCIAL BUILDINGS	3-8%: SEVERE - DEPTH TO ROCK, SHRINK-SWELL, LOW STRENGTH 8+%: SEVERE - SLOPE, DEPTH TO ROCK, SHRINK-SWELL, LOW STRENGTH
ROADS 161	LOCAL ROADS AND STREETS	3-15%: SEVERE - DEPTH TO ROCK, SHRINK-SWELL, LOW STRENGTH 15+%: SEVERE - SLOPE, DEPTH TO ROCK, SHRINK-SWELL, LOW STRENGTH

REGIONAL INTERPRETATIONS

	FOOTNOTES	
REGION 171		
REGION 181		

SOURCE MATERIAL

KEYING ONLY	FODTNOTES	
FILL 191	ROADFILL	3-25%: POOR - THIN LAYER 25+%: POOR - SLOPE, THIN LAYER
SAND 201	SAND	UNSUITED
GRAVEL 211	GRAVEL	UNSUITED
SOIL 221	TOPSOIL	3-15%: POOR - EXCESS ALKALI, TOO CLAYEY, THIN LAYER 15+%: POOR - EXCESS ALKALI, SLOPE, TOO CLAYEY, THIN LAYER

WATER MANAGEMENT

	FOOTNOTES	
PONDRS 231	POND RESERVOIR AREA	SLOPE, DEPTH TO ROCK
DIKES 241	EMBANKMENTS DIKES AND LEVEES	THIN LAYER, LOW STRENGTH
PONDAQ 251	EXCAVATED PONDS AQUIFER FED	NO WATER
DRAIN 261	DRAINAGE	EXCESS ALKALI, DEPTH TO ROCK
IRRIG 271	IRRIGATION	ROOTING DEPTH, SLOPE, EXCESS ALKALI, PERCS SLOWLY
TERRAC 281	TERRACES AND DIVERSIONS	--
WATERW 291	GRASSED WATERWAYS	--

KEYING ONLY — RECORD NO. / CONTROL WORD / NO.

UNIT NAME: YOUJAY
UNIT MODIFIER:

RECREATION

KEYING ONLY			FOOTNOTE	KEYING ONLY			FOOTNOTE
	CAMPS	301	1 3-15%: SEVERE - DUSTY	PLAYGD	321		1 3-6%: SEVERE - TOO CLAYEY, DEPTH TO ROCK
		2	15+%: SEVERE - SLOPE, DUSTY		2		6+%: SEVERE - SLOPE, TOO CLAYEY, DEPTH TO ROCK
		3			3		
		4	CAMP AREAS		4	PLAYGROUNDS	
		5			5		
	PICNIC	311	1 3-15%: SEVERE - DUSTY	PATHS	331		1 3-25%: SEVERE - TOO CLAYEY
		2	15+%: SEVERE - SLOPE, DUSTY		2		25+%: SEVERE - SLOPE, TOO CLAYEY
		3			3	PATHS	
		4	PICNIC AREAS		4	AND	
		5			5	TRAILS	

CAPABILITY AND PREDICTED YIELDS - CROPS AND PASTURE (HIGH LEVEL MANAGEMENT)

FOOTNOTE

	CROPHO	451	CLASS-DETERMINING PHASE	CAPABILITY															
		2		NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.	NIRR	IRR.
		3																	
	CROPS	341	ALL	7E	--														
		2																	
		3																	
		4																	
		5																	
		6																	
		7																	
		8																	
		9																	
		351																	
		2																	
		3																	

WOODLAND SUITABILITY

FOOTNOTE

		CLASS-DETERMINING PHASE	ORO SYM	MANAGEMENT PROBLEMS: EROSION HAZARD	EQUIP. LIMIT	SEEDLING MORT'Y.	WINOTH. HAZARD	PLANT COMPET.	POTENTIAL PRODUCTIVITY: IMPORTANT TREES	SITE INDEX	TREES TO PLANT
WOODS	361	NONE							NONE		
	2										
	3										
	4										
	5										
	6										
	7										
	8										
	9										
	371										
	2										
	3										
	4										
	5										
	6										

WIND BREAKS

FOOTNOTE

	CLASS-DETERMINING PHASE	SPECIES	HT	SPECIES	HT	SPECIES	HT	SPECIES	HT
WINOBK 381	NONE								
2									
3									
4									
5									
6									

WILDLIFE HABITAT SUITABILITY

FOOTNOTE

	CLASS-DETERMINING PHASE	POTENTIAL FOR HABITAT ELEMENTS: GRAIN & SEED	GRASS & LEGUME	WILD HERB.	HAROWD TREES	CONIFER PLANTS	SHRUBS	WETLAND PLANTS	SHALLOW WATER	POTENTIAL AS HABITAT FOR: OPENLAND WILDLIFE	WOODLAND WILDLIFE	WETLAND WILDLIFE	RANGELAND WILDLIFE
WILOLF 391	ALL	V. POOR	V. POOR	POOR	--	--	POOR	V. POOR	V. POOR	V. POOR	--	V. POOR	POOR
2													
3													
4													
5													
6													

POTENTIAL NATIVE PLANT COMMUNITY (RANGELAND OR FOREST UNDERSTORY VEGETATION)

FOOTNOTE

		COMMON PLANT NAME	PLANT SYMBOL (NLSPN)	PERCENTAGE COMPOSITION (DRY WEIGHT) BY CLASS DETERMINING PHASE
PHASE	401			
	2			
PLANT	411	THICKSPIKE WHEATGRASS	AGDA	30
	2	BOTTLEBRUSH SQUIRRELTAIL	SIHY	10
	3	BUD SAGEBRUSH	ARSP5	10
	4	INDIAN RICEGRASS	ORHY	5
	5	GARDNER SALTBUSH	ATNU2	5
	6	SANDBERG BLUEGRASS	POSE	5
	7	LOW SAGEBRUSH	ARAR8	10
	8	WINTERFAT	EURO T	10
	9	BIG SAGEBRUSH	ARTR2	5
	421		OTHER	10
	2			
	3			
	4			
	5			
	6			
PRODUC	431	POTENTIAL PRODUCTION (LBS./AC. DRY WT): FAVORABLE YEARS		450
	2	NORMAL YEARS		350
	3	UNFAVORABLE YEARS		200

	SYM.	FOOTNOTES
NOTES 441	1	SURFACE SOIL IS THIN AND AREAS MAY DEVELOP SEVERE LIMITATION - TOO CLAYEY WITH USE.
2		
3		
4		
5		
6		
7		

FIELD SHEET INDEX MAP

712

1221

1222

1223

1325

1324

1323

R109W

R108W

R107W

T31N

T30N

RIVER

NEW FORK

BOULDER

EAST

CHALK BUTTE 7,908

LOVATT DRAW

BLUE RIDGE

ALKALI DRAW

GRANITE WASH

FAS & SHS

Shelter Cabin 24 Res.

Middle Prong Res.

Tribbals Res.