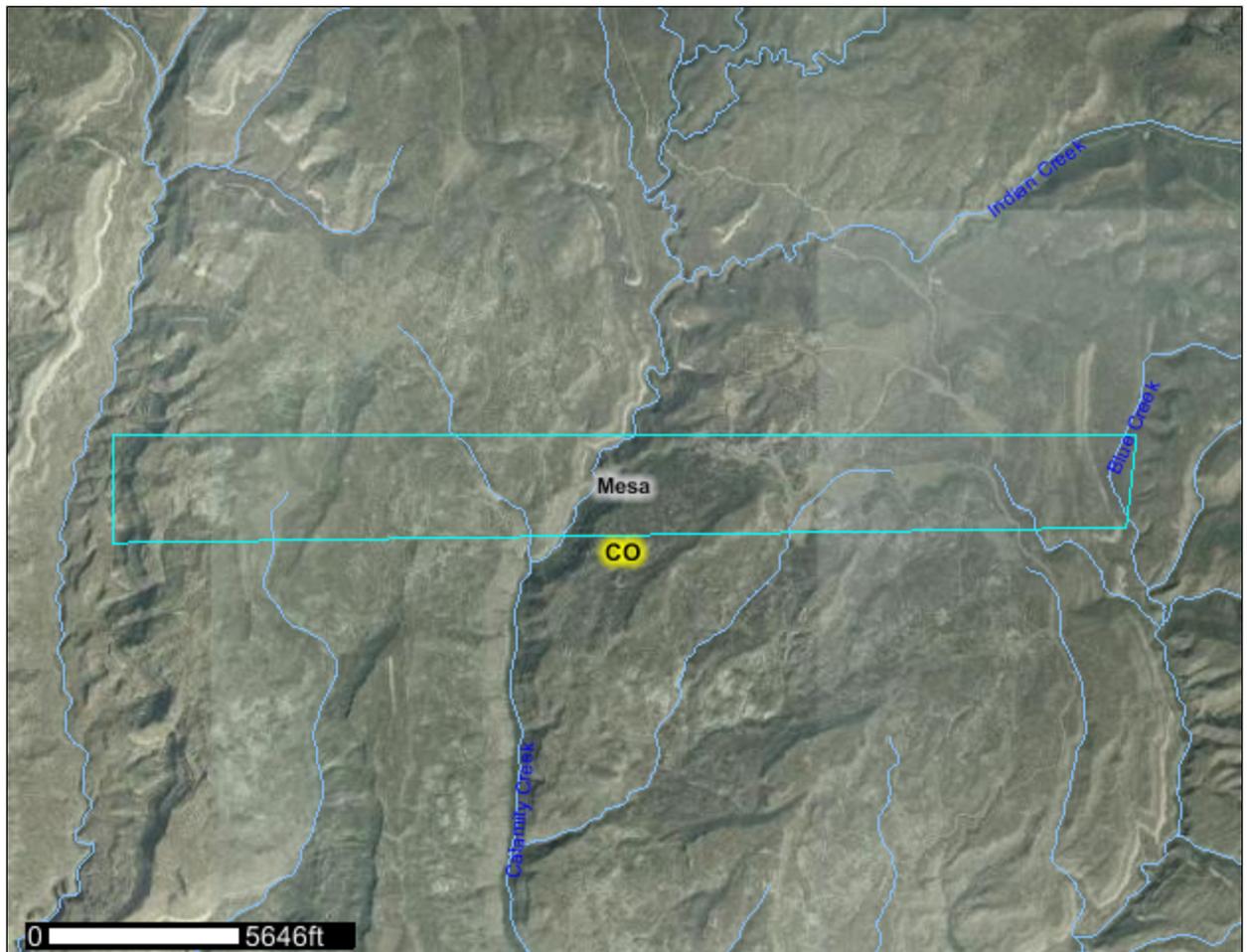




A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Mesa County Area, Colorado; and Uncompahgre National Forest Area, Colorado, Parts of Mesa, Montrose, Ouray, and San Miguel Counties

Cross Section through Gateway Lease Tracts (Part 1)



Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

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

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (<http://soils.usda.gov/sqi/>) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (<http://offices.sc.egov.usda.gov/locator/app?agency=nracs>) or your NRCS State Soil Scientist (http://soils.usda.gov/contact/state_offices/).

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

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Soil Data Mart Web site or the NRCS Web Soil Survey. The Soil Data Mart is the data storage site for the official soil survey information.

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

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

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

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

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individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

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

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

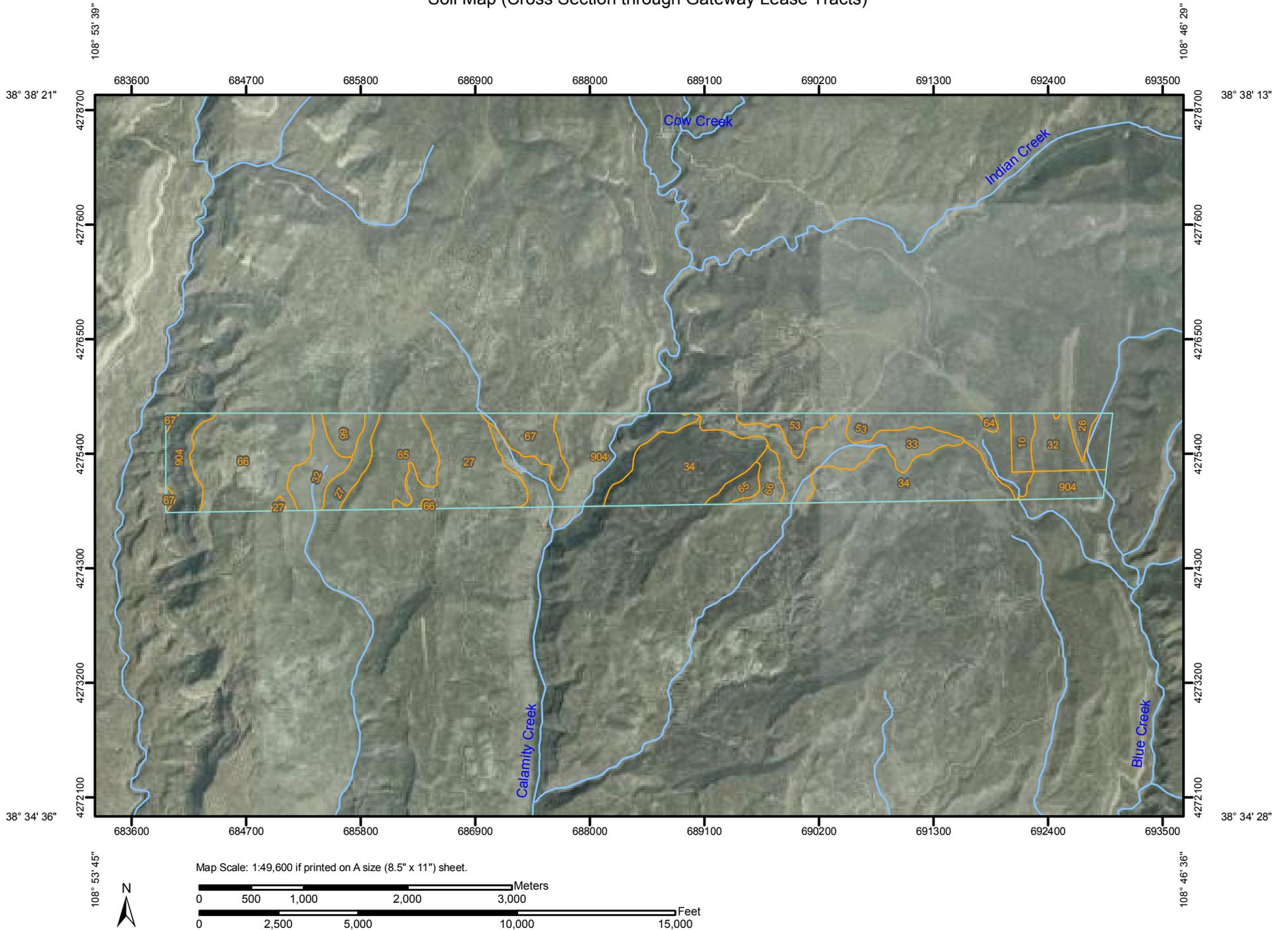
After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in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

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

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Soil Map (Cross Section through Gateway Lease Tracts)



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MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Units

Special Point Features

-  Blowout
-  Borrow Pit
-  Clay Spot
-  Closed Depression
-  Gravel Pit
-  Gravelly Spot
-  Landfill
-  Lava Flow
-  Marsh or swamp
-  Mine or Quarry
-  Miscellaneous Water
-  Perennial Water
-  Rock Outcrop
-  Saline Spot
-  Sandy Spot
-  Severely Eroded Spot
-  Sinkhole
-  Slide or Slip
-  Sodic Spot
-  Spoil Area
-  Stony Spot

 Very Stony Spot

 Wet Spot

 Other

Special Line Features

-  Gully
-  Short Steep Slope
-  Other

Political Features

 Cities

Water Features

 Streams and Canals

Transportation

-  Rails
-  Interstate Highways
-  US Routes
-  Major Roads

MAP INFORMATION

Map Scale: 1:49,600 if printed on A size (8.5" x 11") sheet.

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for accurate map measurements.

Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>
 Coordinate System: UTM Zone 12N NAD83

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Mesa County Area, Colorado
 Survey Area Data: Version 3, Sep 25, 2007

Soil Survey Area: Uncompahgre National Forest Area, Colorado,
 Parts of Mesa, Montrose, Ouray, and San Miguel Counties
 Survey Area Data: Version 6, Mar 25, 2008

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

Date(s) aerial images were photographed: 8/28/2005

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend (Cross Section through Gateway Lease Tracts)

Mesa County Area, Colorado (CO680)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
27	Rock outcrop-Biedsaw complex, 25 to 65 percent slopes, extremely bouldery	218.8	11.1%
32	Iles loam, dry, 3 to 12 percent slopes	65.3	3.3%
33	Fergus-Zoltay complex, 3 to 12 percent slopes	172.2	8.7%
34	Wrayha-Dollard-Fergus complex, 25 to 65 percent slopes, very stony	381.6	19.3%
53	Bodot-Mellenthin-Rock outcrop complex, 6 to 65 percent slopes, extremely stony	152.6	7.7%
64	Barx-Progresso complex, 3 to 12 percent slopes	5.6	0.3%
65	Progresso-Rock outcrop-Bowdish complex, 3 to 12 percent slopes, stony	154.9	7.8%
66	Bodot-Sili-Rock outcrop complex, 5 to 25 percent slopes, very bouldery	293.1	14.8%
67	Gladel-Bond-Rock outcrop complex, 3 to 25 percent slopes	74.7	3.8%
904	Rock outcrop, 50 to 99 percent slopes	332.2	16.8%
Subtotals for Soil Survey Area		1,850.9	93.5%
Totals for Area of Interest		1,979.8	100.0%

Uncompahgre National Forest Area, Colorado, Parts of Mesa, Montrose, Ouray, and San Miguel Counties (CO676)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
10	Arabrab-Dalhart families complex, 3 to 15 percent slopes	29.4	1.5%
26	Mirand-Callan families-Chilson variant complex, 3 to 20 percent slopes	17.2	0.9%
32	Ustorhents-Ustochrepts-Rock outcrop complex, 40 to 150 percent slopes	82.3	4.2%
Subtotals for Soil Survey Area		128.9	6.5%
Totals for Area of Interest		1,979.8	100.0%

Map Unit Descriptions (Cross Section through Gateway Lease Tracts)

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

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

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

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

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

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

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

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

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

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An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Mesa County Area, Colorado

27—Rock outcrop-Biedsaw complex, 25 to 65 percent slopes, extremely bouldery

Map Unit Setting

Elevation: 5,800 to 8,000 feet

Mean annual precipitation: 10 to 13 inches

Mean annual air temperature: 46 to 52 degrees F

Frost-free period: 100 to 135 days

Map Unit Composition

Rock outcrop: 55 percent

Biedsaw and similar soils: 30 percent

Description of Rock Outcrop

Setting

Landform: Cliffs on canyons, cliffs on hills, free faces on canyons, free faces on hills, ledges on canyons, ledges on hills

Landform position (three-dimensional): Free face, side slope, base slope

Down-slope shape: Convex, linear

Across-slope shape: Linear, convex

Parent material: Residuum weathered from sandstone and shale

Properties and qualities

Slope: 25 to 65 percent

Depth to restrictive feature: 0 to 4 inches to lithic bedrock

Capacity of the most limiting layer to transmit water (Ksat): Very low to low (0.00 to 0.00 in/hr)

Available water capacity: Very low (about 0.0 inches)

Interpretive groups

Land capability (nonirrigated): 8s

Typical profile

0 to 60 inches: Unweathered bedrock

Description of Biedsaw

Setting

Landform: Mesas

Landform position (two-dimensional): Backslope

Landform position (three-dimensional): Flat

Down-slope shape: Convex

Across-slope shape: Linear

Parent material: Colluvium derived from sandstone and shale over residuum weathered from clayey shale

Properties and qualities

Slope: 25 to 65 percent

Surface area covered with cobbles, stones or boulders: 9.0 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

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Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 10 percent
Maximum salinity: Nonsaline to very slightly saline (2.0 to 4.0 mmhos/cm)
Available water capacity: Moderate (about 8.6 inches)

Interpretive groups

Land capability (nonirrigated): 7e

Typical profile

0 to 16 inches: Very cobbly clay loam
16 to 32 inches: Silty clay
32 to 60 inches: Silty clay

32—Iles loam, dry, 3 to 12 percent slopes

Map Unit Setting

Elevation: 7,500 to 8,000 feet
Mean annual precipitation: 16 to 18 inches
Mean annual air temperature: 43 to 45 degrees F
Frost-free period: 75 to 100 days

Map Unit Composition

Iles, dry, and similar soils: 90 percent

Description of Iles, Dry

Setting

Landform: Mesas
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Flat
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Colluvium and/or residuum weathered from sandstone and shale

Properties and qualities

Slope: 3 to 12 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Available water capacity: High (about 10.0 inches)

Interpretive groups

Land capability (nonirrigated): 4e
Ecological site: Loamy Foothills (R048AY284CO)

Other vegetative classification: LOAMY FOOTHILLS (048AY284CO)

Typical profile

0 to 3 inches: Loam
3 to 6 inches: Silty clay loam
6 to 14 inches: Clay
14 to 22 inches: Clay
22 to 60 inches: Clay loam

33—Fergus-Zoltay complex, 3 to 12 percent slopes

Map Unit Setting

Elevation: 7,400 to 8,200 feet
Mean annual precipitation: 16 to 18 inches
Mean annual air temperature: 43 to 45 degrees F
Frost-free period: 75 to 100 days

Map Unit Composition

Fergus and similar soils: 45 percent
Zoltay and similar soils: 40 percent

Description of Fergus

Setting

Landform: Terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from sandstone and shale and/or colluvium

Properties and qualities

Slope: 3 to 12 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Available water capacity: High (about 10.9 inches)

Interpretive groups

Land capability (nonirrigated): 4e
Ecological site: Foothill Swale (R048AY285CO)

Typical profile

0 to 8 inches: Clay loam
8 to 24 inches: Clay loam
24 to 60 inches: Clay loam

Description of Zoltay

Setting

Landform: Terraces

Landform position (two-dimensional): Footslope

Landform position (three-dimensional): Tread

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Alluvium and/or colluvium derived from sandstone and shale

Properties and qualities

Slope: 3 to 12 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum content: 10 percent

Available water capacity: Moderate (about 8.1 inches)

Interpretive groups

Land capability (nonirrigated): 4e

Ecological site: Shallow Slopes (R048AY307CO)

Typical profile

0 to 3 inches: Loam

3 to 18 inches: Silty clay loam

18 to 39 inches: Clay

39 to 60 inches: Gravelly clay

34—Wrayha-Dollard-Fergus complex, 25 to 65 percent slopes, very stony

Map Unit Setting

Elevation: 7,400 to 8,200 feet

Mean annual precipitation: 16 to 18 inches

Mean annual air temperature: 43 to 45 degrees F

Frost-free period: 75 to 100 days

Map Unit Composition

Wrayha and similar soils: 35 percent

Dollard and similar soils: 30 percent

Fergus and similar soils: 20 percent

Description of Wrayha

Setting

Landform: Mesas

Landform position (two-dimensional): Backslope

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Landform position (three-dimensional): Flat
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Colluvium derived from sandstone and shale and/or residuum weathered from clayey shale

Properties and qualities

Slope: 30 to 65 percent
Surface area covered with cobbles, stones or boulders: 1.5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Gypsum, maximum content: 1 percent
Maximum salinity: Nonsaline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 5.0
Available water capacity: High (about 10.5 inches)

Interpretive groups

Land capability (nonirrigated): 7e

Typical profile

0 to 2 inches: Gravelly loam
2 to 7 inches: Gravelly clay loam
7 to 60 inches: Silty clay loam

Description of Dollard

Setting

Landform: Mesas
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Flat
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Colluvium derived from sandstone and shale and/or residuum weathered from clayey shale

Properties and qualities

Slope: 30 to 65 percent
Surface area covered with cobbles, stones or boulders: 1.5 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 45 percent
Gypsum, maximum content: 1 percent
Maximum salinity: Nonsaline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 5.0
Available water capacity: Low (about 5.5 inches)

Interpretive groups

Land capability (nonirrigated): 7e

Typical profile

*0 to 3 inches: Gravelly silty clay loam
3 to 11 inches: Gravelly silty clay loam
11 to 35 inches: Clay
35 to 39 inches: Weathered bedrock*

Description of Fergus

Setting

*Landform: Mesas
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Flat
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Colluvium derived from sandstone and shale*

Properties and qualities

*Slope: 25 to 65 percent
Surface area covered with cobbles, stones or boulders: 1.5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Available water capacity: High (about 10.7 inches)*

Interpretive groups

Land capability (nonirrigated): 7e

Typical profile

*0 to 8 inches: Loam
8 to 24 inches: Clay loam
24 to 60 inches: Clay loam*

53—Bodot-Mellenthin-Rock outcrop complex, 6 to 65 percent slopes, extremely stony

Map Unit Setting

*Elevation: 5,500 to 8,100 feet
Mean annual precipitation: 10 to 13 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 90 to 135 days*

Map Unit Composition

Bodot and similar soils: 45 percent
Mellenthin and similar soils: 25 percent
Rock outcrop: 20 percent

Description of Bodot

Setting

Landform: Mesas
Landform position (two-dimensional): Backslope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Colluvium derived from sandstone and shale over residuum weathered from clayey shale

Properties and qualities

Slope: 6 to 55 percent
Surface area covered with cobbles, stones or boulders: 9.0 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 10 percent
Maximum salinity: Nonsaline (0.0 to 2.0 mmhos/cm)
Available water capacity: Low (about 4.5 inches)

Interpretive groups

Land capability (nonirrigated): 7e

Typical profile

0 to 5 inches: Very gravelly clay loam
5 to 32 inches: Clay
32 to 36 inches: Weathered bedrock

Description of Mellenthin

Setting

Landform: Benches
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Residuum weathered from calcareous sandstone

Properties and qualities

Slope: 6 to 65 percent
Surface area covered with cobbles, stones or boulders: 0.1 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent

Custom Soil Resource Report

Maximum salinity: Nonsaline (0.0 to 2.0 mmhos/cm)
Available water capacity: Very low (about 1.5 inches)

Interpretive groups

Land capability (nonirrigated): 7e

Typical profile

0 to 4 inches: Fine sandy loam
4 to 13 inches: Very cobbly fine sandy loam
13 to 19 inches: Extremely cobbly fine sandy loam
19 to 23 inches: Unweathered bedrock

Description of Rock Outcrop

Setting

Landform: Cliffs on canyons, cliffs on hills, free faces on canyons, free faces on hills, ledges on canyons, ledges on hills
Landform position (three-dimensional): Free face, side slope, base slope
Down-slope shape: Linear, convex
Across-slope shape: Convex, linear
Parent material: Residuum weathered from sandstone and shale

Properties and qualities

Slope: 6 to 65 percent
Depth to restrictive feature: 0 to 4 inches to lithic bedrock
Capacity of the most limiting layer to transmit water (Ksat): Very low to low (0.00 to 0.00 in/hr)
Available water capacity: Very low (about 0.0 inches)

Interpretive groups

Land capability (nonirrigated): 8s

Typical profile

0 to 60 inches: Unweathered bedrock

64—Barx-Progresso complex, 3 to 12 percent slopes

Map Unit Setting

Elevation: 5,500 to 7,000 feet
Mean annual precipitation: 10 to 13 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 100 to 135 days

Map Unit Composition

Barx and similar soils: 45 percent
Progresso and similar soils: 40 percent

Description of Barx

Setting

Landform: Mesas

Custom Soil Resource Report

Landform position (two-dimensional): Summit
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Alluvium derived from sandstone and shale and/or colluvium derived from sandstone and shale

Properties and qualities

Slope: 3 to 12 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline to very slightly saline (2.0 to 4.0 mmhos/cm)
Available water capacity: High (about 10.8 inches)

Interpretive groups

Land capability (nonirrigated): 4e
Ecological site: Semidesert Sandy Loam (R034XY326CO)

Typical profile

0 to 5 inches: Fine sandy loam
5 to 27 inches: Clay loam
27 to 60 inches: Clay loam

Description of Progresso

Setting

Landform: Mesas
Landform position (two-dimensional): Summit
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Residuum weathered from sandstone

Properties and qualities

Slope: 3 to 12 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water capacity: Low (about 3.1 inches)

Interpretive groups

Land capability (nonirrigated): 4e
Ecological site: Semidesert Sandy Loam (R034XY326CO)

Typical profile

0 to 6 inches: Fine sandy loam
6 to 17 inches: Sandy clay loam
17 to 21 inches: Fine sandy loam
21 to 26 inches: Weathered bedrock

26 to 30 inches: Unweathered bedrock

65—Progresso-Rock outcrop-Bowdish complex, 3 to 12 percent slopes, stony

Map Unit Setting

Elevation: 5,200 to 7,000 feet

Mean annual precipitation: 10 to 13 inches

Mean annual air temperature: 46 to 50 degrees F

Frost-free period: 100 to 135 days

Map Unit Composition

Progresso and similar soils: 35 percent

Rock outcrop: 30 percent

Bowdish and similar soils: 25 percent

Description of Progresso

Setting

Landform: Mesas

Landform position (two-dimensional): Summit

Down-slope shape: Convex

Across-slope shape: Linear

Parent material: Residuum weathered from sandstone

Properties and qualities

Slope: 3 to 12 percent

Depth to restrictive feature: 20 to 40 inches to lithic bedrock

Drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum content: 25 percent

Available water capacity: Low (about 3.1 inches)

Interpretive groups

Land capability (nonirrigated): 4e

Typical profile

0 to 6 inches: Fine sandy loam

6 to 17 inches: Sandy clay loam

17 to 21 inches: Fine sandy loam

21 to 26 inches: Weathered bedrock

26 to 30 inches: Unweathered bedrock

Description of Rock Outcrop

Setting

Landform: Cliffs on canyons, cliffs on hills, free faces on canyons, free faces on hills, ledges on canyons, ledges on hills

Landform position (three-dimensional): Side slope, base slope, free face

Down-slope shape: Convex, linear

Across-slope shape: Linear, convex

Parent material: Residuum weathered from sandstone

Properties and qualities

Slope: 3 to 12 percent

Depth to restrictive feature: 0 to 4 inches to lithic bedrock

Capacity of the most limiting layer to transmit water (Ksat): Very low to low (0.00 to 0.00 in/hr)

Available water capacity: Very low (about 0.0 inches)

Interpretive groups

Land capability (nonirrigated): 8s

Typical profile

0 to 60 inches: Unweathered bedrock

Description of Bowdish

Setting

Landform: Mesas

Landform position (two-dimensional): Summit

Down-slope shape: Convex

Across-slope shape: Linear

Parent material: Residuum weathered from sandstone

Properties and qualities

Slope: 3 to 12 percent

Surface area covered with cobbles, stones or boulders: 0.1 percent

Depth to restrictive feature: 20 to 40 inches to lithic bedrock

Drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum content: 30 percent

Available water capacity: Low (about 3.1 inches)

Interpretive groups

Land capability (nonirrigated): 4e

Typical profile

0 to 2 inches: Sandy loam

2 to 26 inches: Gravelly sandy clay loam

26 to 30 inches: Unweathered bedrock

66—Bodot-Sili-Rock outcrop complex, 5 to 25 percent slopes, very bouldery

Map Unit Setting

Elevation: 5,500 to 8,100 feet

Mean annual precipitation: 10 to 13 inches

Mean annual air temperature: 46 to 50 degrees F

Frost-free period: 100 to 135 days

Map Unit Composition

Bodot and similar soils: 45 percent

Sili and similar soils: 25 percent

Rock outcrop: 20 percent

Description of Bodot

Setting

Landform: Benches

Landform position (two-dimensional): Footslope

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Colluvium derived from sandstone and shale over residuum weathered from clayey shale

Properties and qualities

Slope: 6 to 25 percent

Surface area covered with cobbles, stones or boulders: 1.5 percent

Depth to restrictive feature: 20 to 40 inches to paralithic bedrock

Drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum content: 10 percent

Maximum salinity: Nonsaline (0.0 to 2.0 mmhos/cm)

Available water capacity: Low (about 4.9 inches)

Interpretive groups

Land capability (nonirrigated): 6e

Typical profile

0 to 5 inches: Clay loam

5 to 32 inches: Clay

32 to 36 inches: Weathered bedrock

Description of Sili

Setting

Landform: Benches

Landform position (two-dimensional): Footslope

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Colluvium derived from sandstone and shale over residuum weathered from clayey shale

Properties and qualities

Slope: 5 to 25 percent

Surface area covered with cobbles, stones or boulders: 1.5 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum content: 15 percent

Maximum salinity: Nonsaline (0.0 to 2.0 mmhos/cm)

Sodium adsorption ratio, maximum: 20.0

Available water capacity: High (about 9.3 inches)

Interpretive groups

Land capability (nonirrigated): 6e

Ecological site: Clayey Foothills (R034XY289CO)

Typical profile

0 to 3 inches: Clay loam

3 to 9 inches: Gravelly clay loam

9 to 15 inches: Clay loam

15 to 39 inches: Clay

39 to 60 inches: Clay

Description of Rock Outcrop

Setting

Landform: Cliffs on canyons, cliffs on hills, free faces on canyons, free faces on hills, ledges on canyons, ledges on hills

Landform position (three-dimensional): Side slope, base slope, free face

Down-slope shape: Linear, convex

Across-slope shape: Linear, convex

Parent material: Residuum weathered from sandstone and shale

Properties and qualities

Slope: 5 to 25 percent

Depth to restrictive feature: 0 to 4 inches to lithic bedrock

Capacity of the most limiting layer to transmit water (Ksat): Very low to low (0.00 to 0.00 in/hr)

Available water capacity: Very low (about 0.0 inches)

Interpretive groups

Land capability (nonirrigated): 8s

Typical profile

0 to 60 inches: Unweathered bedrock

67—Gladel-Bond-Rock outcrop complex, 3 to 25 percent slopes

Map Unit Setting

Elevation: 5,500 to 7,000 feet

Mean annual precipitation: 10 to 13 inches

Mean annual air temperature: 46 to 50 degrees F

Frost-free period: 100 to 160 days

Map Unit Composition

Gladel and similar soils: 40 percent

Bond and similar soils: 30 percent

Rock outcrop: 20 percent

Description of Gladel

Setting

Landform: Benches, mesas

Landform position (two-dimensional): Summit

Down-slope shape: Linear, convex

Across-slope shape: Linear

Parent material: Residuum weathered from sandstone

Properties and qualities

Slope: 3 to 12 percent

Depth to restrictive feature: 8 to 20 inches to lithic bedrock

Drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum content: 10 percent

Maximum salinity: Nonsaline (0.0 to 2.0 mmhos/cm)

Available water capacity: Very low (about 0.9 inches)

Interpretive groups

Land capability (nonirrigated): 7s

Typical profile

0 to 4 inches: Sandy loam

4 to 8 inches: Sandy loam

8 to 12 inches: Unweathered bedrock

Description of Bond

Setting

Landform: Benches, mesas

Custom Soil Resource Report

Landform position (two-dimensional): Summit

Down-slope shape: Linear, convex

Across-slope shape: Linear

Parent material: Colluvium derived from sandstone and/or residuum weathered from sandstone

Properties and qualities

Slope: 3 to 12 percent

Depth to restrictive feature: 10 to 20 inches to lithic bedrock

Drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum content: 10 percent

Available water capacity: Very low (about 2.2 inches)

Interpretive groups

Land capability (nonirrigated): 6s

Typical profile

0 to 7 inches: Fine sandy loam

7 to 14 inches: Sandy clay loam

14 to 18 inches: Unweathered bedrock

Description of Rock Outcrop

Setting

Landform: Cliffs on canyons, cliffs on hills, free faces on canyons, free faces on hills, ledges on canyons, ledges on hills

Landform position (three-dimensional): Side slope, base slope, free face

Down-slope shape: Convex, linear

Across-slope shape: Linear, convex

Parent material: Residuum weathered from sandstone and shale

Properties and qualities

Slope: 3 to 25 percent

Depth to restrictive feature: 0 to 4 inches to lithic bedrock

Capacity of the most limiting layer to transmit water (Ksat): Very low to low (0.00 to 0.00 in/hr)

Available water capacity: Very low (about 0.0 inches)

Interpretive groups

Land capability (nonirrigated): 8s

Typical profile

0 to 60 inches: Unweathered bedrock

904—Rock outcrop, 50 to 99 percent slopes

Map Unit Composition

Rock outcrop: 80 percent

Description of Rock Outcrop

Setting

Landform: Cliffs on canyons, cliffs on hills, free faces on canyons, free faces on hills, ledges on canyons, ledges on hills

Landform position (three-dimensional): Free face, side slope, base slope

Down-slope shape: Linear, convex

Across-slope shape: Convex, linear

Parent material: Residuum weathered from sandstone over residuum weathered from sandstone and shale

Properties and qualities

Slope: 50 to 99 percent

Depth to restrictive feature: 0 to 4 inches to lithic bedrock

Capacity of the most limiting layer to transmit water (Ksat): Very low to low (0.00 to 0.00 in/hr)

Available water capacity: Very low (about 0.0 inches)

Interpretive groups

Land capability (nonirrigated): 8s

Typical profile

0 to 60 inches: Unweathered bedrock

Uncompahgre National Forest Area, Colorado, Parts of Mesa, Montrose, Ouray, and San Miguel Counties

10—Arabrab-Dalhart families complex, 3 to 15 percent slopes

Map Unit Setting

Elevation: 6,400 to 7,700 feet

Mean annual precipitation: 12 to 16 inches

Mean annual air temperature: 52 to 54 degrees F

Frost-free period: 100 to 120 days

Map Unit Composition

Arabrab family and similar soils: 50 percent

Dalhart family and similar soils: 40 percent

Minor components: 5 percent

Description of Arabrab Family

Setting

Landform: Mesas, ridges, plateaus

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Residuum weathered from sandstone

Properties and qualities

Slope: 3 to 15 percent

Depth to restrictive feature: 10 to 20 inches to lithic bedrock

Drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum content: 5 percent

Maximum salinity: Nonsaline (0.0 to 2.0 mmhos/cm)

Available water capacity: Very low (about 2.3 inches)

Interpretive groups

Land capability (nonirrigated): 7e

Typical profile

0 to 6 inches: Sandy loam

6 to 14 inches: Sandy clay loam

14 to 19 inches: Gravelly sandy clay loam

19 to 19 inches: Unweathered bedrock

Description of Dalhart Family

Setting

Landform: Plateaus, plateaus

Down-slope shape: Linear

Across-slope shape: Linear

Properties and qualities

Slope: 3 to 15 percent

Depth to restrictive feature: 20 inches to lithic bedrock

Custom Soil Resource Report

Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 4.0 mmhos/cm)
Available water capacity: Very low (about 3.0 inches)

Interpretive groups

Land capability (nonirrigated): 6e

Typical profile

0 to 4 inches: Sandy loam
4 to 13 inches: Sandy clay loam
13 to 37 inches: Sandy clay loam
37 to 41 inches: Unweathered bedrock

Minor Components

Aquic ustifluvents

Percent of map unit: 5 percent
Landform: Flood plains

26—Mirand-Callan families-Chilson variant complex, 3 to 20 percent slopes

Map Unit Setting

Elevation: 7,000 to 7,600 feet
Mean annual precipitation: 14 to 19 inches
Mean annual air temperature: 43 to 52 degrees F
Frost-free period: 75 to 110 days

Map Unit Composition

Mirand family and similar soils: 45 percent
Callan family and similar soils: 25 percent
Chilson variant and similar soils: 15 percent

Description of Mirand Family

Setting

Landform: Plateaus
Landform position (two-dimensional): Backslope, summit
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Mixed loess over alluvium and/or materials derived from sandstone and shale

Custom Soil Resource Report

Properties and qualities

Slope: 3 to 10 percent
Depth to restrictive feature: 20 inches to lithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline (0.0 to 2.0 mmhos/cm)
Available water capacity: Very low (about 2.9 inches)

Interpretive groups

Land capability (nonirrigated): 6e

Typical profile

0 to 8 inches: Loam
8 to 37 inches: Clay loam
37 to 60 inches: Clay loam

Description of Callan Family

Setting

Landform: Plateaus
Landform position (two-dimensional): Backslope, summit
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Mixed loess over alluvium and/or materials derived from sandstone and shale

Properties and qualities

Slope: 3 to 10 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Maximum salinity: Nonsaline (0.0 to 2.0 mmhos/cm)
Available water capacity: High (about 9.7 inches)

Interpretive groups

Land capability (nonirrigated): 6e

Typical profile

0 to 7 inches: Silt loam
7 to 10 inches: Clay loam
10 to 45 inches: Clay
45 to 60 inches: Clay loam

Description of Chilson Variant

Setting

Landform: Plateaus

Custom Soil Resource Report

Landform position (two-dimensional): Backslope, summit

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Mixed loess over alluvium and/or materials derived from sandstone and shale

Properties and qualities

Slope: 8 to 20 percent

Depth to restrictive feature: 7 to 20 inches to lithic bedrock

Drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water capacity: Low (about 3.1 inches)

Interpretive groups

Land capability (nonirrigated): 6e

Typical profile

0 to 5 inches: Sandy loam

5 to 14 inches: Sandy clay loam, cobbly sandy clay loam

14 to 19 inches: Cobbly clay, clay

19 to 23 inches: Unweathered bedrock

32—Ustorthents-Ustochrepts-Rock outcrop complex, 40 to 150 percent slopes

Map Unit Setting

Elevation: 6,200 to 9,700 feet

Mean annual precipitation: 14 to 26 inches

Mean annual air temperature: 37 to 46 degrees F

Frost-free period: 60 to 100 days

Map Unit Composition

Ustorthents and similar soils: 40 percent

Ustochrepts and similar soils: 30 percent

Rock outcrop: 20 percent

Description of Ustorthents

Setting

Landform: Canyons, plateaus

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Sandy loam gravelly residuum over dakota sandstone

Properties and qualities

Slope: 40 to 70 percent

Custom Soil Resource Report

Depth to restrictive feature: 10 to 60 inches to lithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Low (about 3.7 inches)

Interpretive groups

Land capability classification (irrigated): 7e
Land capability (nonirrigated): 7e

Typical profile

0 to 4 inches: Cobbly loam
4 to 60 inches: Very cobbly sandy loam

Description of Ustorchrepts

Setting

Landform: Canyons, plateaus
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Residuum weathered from sandstone

Properties and qualities

Slope: 60 to 99 percent
Depth to restrictive feature: 10 to 60 inches to lithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high
(0.06 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Low (about 3.4 inches)

Interpretive groups

Land capability (nonirrigated): 7e

Typical profile

0 to 4 inches: Variable
4 to 40 inches: Very cobbly clay loam
40 to 44 inches: Weathered bedrock

Description of Rock Outcrop

Setting

Landform: Canyons, plateaus
Down-slope shape: Linear
Across-slope shape: Linear

Properties and qualities

Slope: 40 to 99 percent
Depth to restrictive feature: 0 inches to lithic bedrock
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Available water capacity: Very low (about 0.0 inches)

Interpretive groups

Land capability (nonirrigated): 8s

Custom Soil Resource Report

Typical profile

0 to 60 inches: Unweathered bedrock

Soil Information for All Uses

Suitabilities and Limitations for Use

The Suitabilities and Limitations for Use section includes various soil interpretations displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each interpretation.

Land Classifications

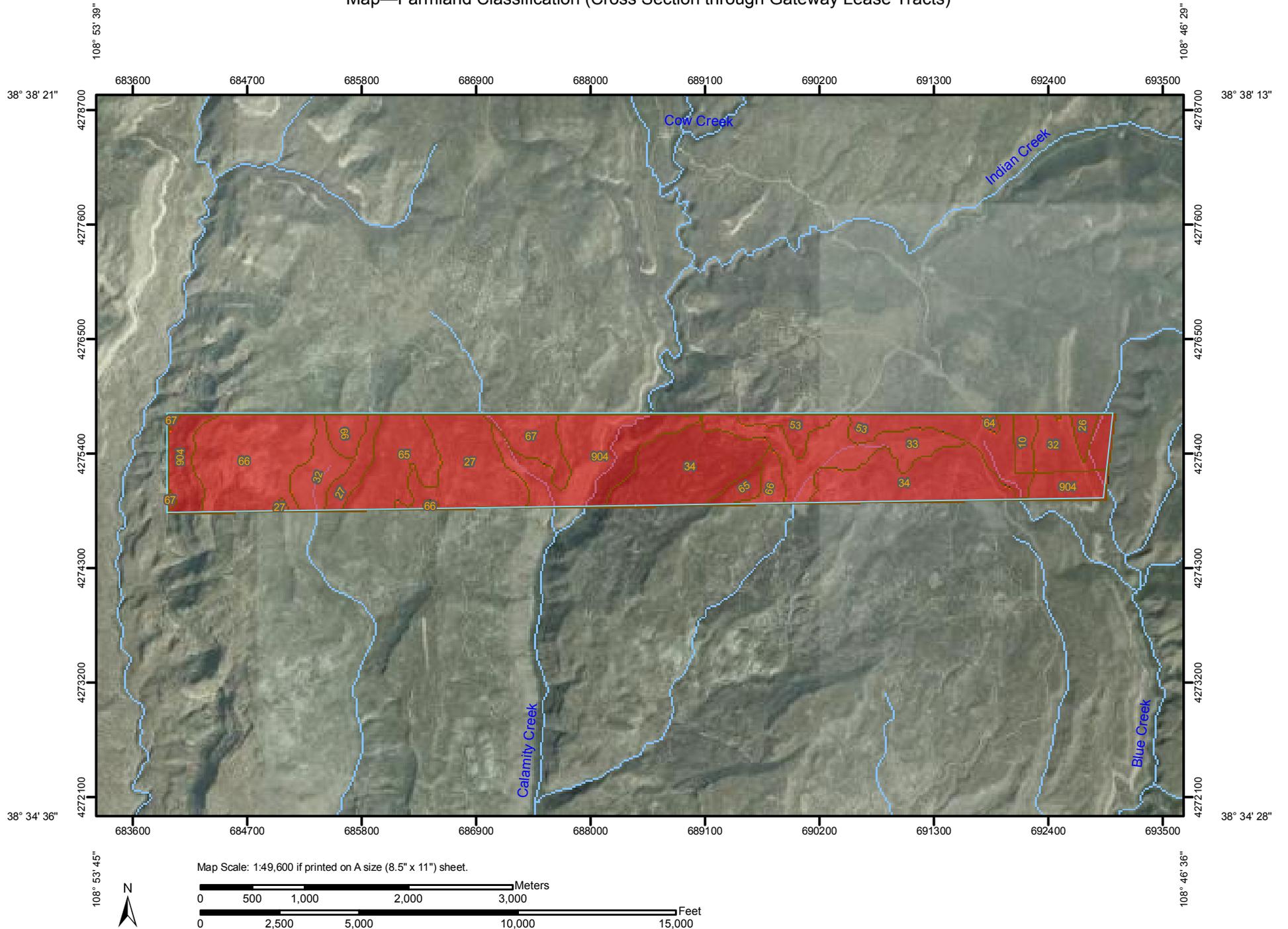
Land Classifications are specified land use and management groupings that are assigned to soil areas because combinations of soil have similar behavior for specified practices. Most are based on soil properties and other factors that directly influence the specific use of the soil. Example classifications include ecological site classification, farmland classification, irrigated and nonirrigated land capability classification, and hydric rating.

Farmland Classification (Cross Section through Gateway Lease Tracts)

Farmland classification identifies map units as prime farmland, farmland of statewide importance, farmland of local importance, or unique farmland. It identifies the location and extent of the soils that are best suited to food, feed, fiber, forage, and oilseed crops. NRCS policy and procedures on prime and unique farmlands are published in the "Federal Register," Vol. 43, No. 21, January 31, 1978.

Custom Soil Resource Report

Map—Farmland Classification (Cross Section through Gateway Lease Tracts)



Custom Soil Resource Report

MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Units

Soil Ratings

-  Not prime farmland
-  All areas are prime farmland
-  Prime farmland if drained
-  Prime farmland if protected from flooding or not frequently flooded during the growing season
-  Prime farmland if irrigated
-  Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season
-  Prime farmland if irrigated and drained
-  Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season

-  Prime farmland if subsoiled, completely removing the root inhibiting soil layer
-  Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
-  Prime farmland if irrigated and reclaimed of excess salts and sodium
-  Farmland of statewide importance
-  Farmland of local importance
-  Farmland of unique importance
-  Not rated or not available

Political Features

 Cities

Water Features

 Streams and Canals

Transportation

 Rails

 Interstate Highways

 US Routes

 Major Roads

MAP INFORMATION

Map Scale: 1:49,600 if printed on A size (8.5" x 11") sheet.

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for accurate map measurements.

Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>
 Coordinate System: UTM Zone 12N NAD83

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Mesa County Area, Colorado
 Survey Area Data: Version 3, Sep 25, 2007

Soil Survey Area: Uncompahgre National Forest Area, Colorado, Parts of Mesa, Montrose, Ouray, and San Miguel Counties
 Survey Area Data: Version 6, Mar 25, 2008

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

Date(s) aerial images were photographed: 8/28/2005

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—Farmland Classification (Cross Section through Gateway Lease Tracts)

Farmland Classification— Summary by Map Unit — Mesa County Area, Colorado (CO680)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
27	Rock outcrop-Biedsaw complex, 25 to 65 percent slopes, extremely bouldery	Not prime farmland	218.8	11.1%
32	Iles loam, dry, 3 to 12 percent slopes	Not prime farmland	65.3	3.3%
33	Fergus-Zoltay complex, 3 to 12 percent slopes	Not prime farmland	172.2	8.7%
34	Wrayha-Dollard-Fergus complex, 25 to 65 percent slopes, very stony	Not prime farmland	381.6	19.3%
53	Bodot-Mellenthin-Rock outcrop complex, 6 to 65 percent slopes, extremely stony	Not prime farmland	152.6	7.7%
64	Barx-Progresso complex, 3 to 12 percent slopes	Not prime farmland	5.6	0.3%
65	Progresso-Rock outcrop-Bowdish complex, 3 to 12 percent slopes, stony	Not prime farmland	154.9	7.8%
66	Bodot-Sili-Rock outcrop complex, 5 to 25 percent slopes, very bouldery	Not prime farmland	293.1	14.8%
67	Gladel-Bond-Rock outcrop complex, 3 to 25 percent slopes	Not prime farmland	74.7	3.8%
904	Rock outcrop, 50 to 99 percent slopes	Not prime farmland	332.2	16.8%
Subtotals for Soil Survey Area			1,850.9	93.5%
Totals for Area of Interest			1,979.8	100.0%

Farmland Classification— Summary by Map Unit — Uncompahgre National Forest Area, Colorado, Parts of Mesa, Montrose, Ouray, and San Miguel Counties (CO676)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
10	Arabrab-Dalhart families complex, 3 to 15 percent slopes	Not prime farmland	29.4	1.5%
26	Mirand-Callan families-Chilson variant complex, 3 to 20 percent slopes	Not prime farmland	17.2	0.9%
32	Ustorthents-Ustochrepts-Rock outcrop complex, 40 to 150 percent slopes	Not prime farmland	82.3	4.2%
Subtotals for Soil Survey Area			128.9	6.5%
Totals for Area of Interest			1,979.8	100.0%

Rating Options—Farmland Classification (Cross Section through Gateway Lease Tracts)

Aggregation Method: No Aggregation Necessary

Tie-break Rule: Lower

Hydric Rating by Map Unit (Cross Section through Gateway Lease Tracts)

This rating indicates the proportion of map units that meets the criteria for hydric soils. Map units are composed of one or more map unit components or soil types, each of which is rated as hydric soil or not hydric. Map units that are made up dominantly of hydric soils may have small areas of minor nonhydric components in the higher positions on the landform, and map units that are made up dominantly of nonhydric soils may have small areas of minor hydric components in the lower positions on the landform. Each map unit is designated as "all hydric," "partially hydric," "not hydric," or "unknown hydric," depending on the rating of its respective components.

"All hydric" means that all components listed for a given map unit are rated as being hydric, while "not hydric" means that all components are rated as not hydric. "Partially hydric" means that at least one component of the map unit is rated as hydric, and at least one component is rated as not hydric. "Unknown hydric" indicates that at least one component is not rated so a definitive rating for the map unit cannot be made.

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

The NTCHS definition identifies general soil properties that are associated with wetness. In order to determine whether a specific soil is a hydric soil or nonhydric soil, however, more specific information, such as information about the depth and duration of the water table, is needed. Thus, criteria that identify those estimated soil properties unique to hydric soils have been established (Federal Register, 2002). These criteria are used to identify map unit components that normally are associated with wetlands. The criteria used are selected estimated soil properties that are described in "Soil Taxonomy" (Soil Survey Staff, 1999) and "Keys to Soil Taxonomy" (Soil Survey Staff, 2006) and in the "Soil Survey Manual" (Soil Survey Division Staff, 1993).

If soils are wet enough for a long enough period of time to be considered hydric, they should exhibit certain properties that can be easily observed in the field. These visible properties are indicators of hydric soils. The indicators used to make onsite determinations of hydric soils are specified in "Field Indicators of Hydric Soils in the United States" (Hurt and Vasilas, 2006).

References:

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

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Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

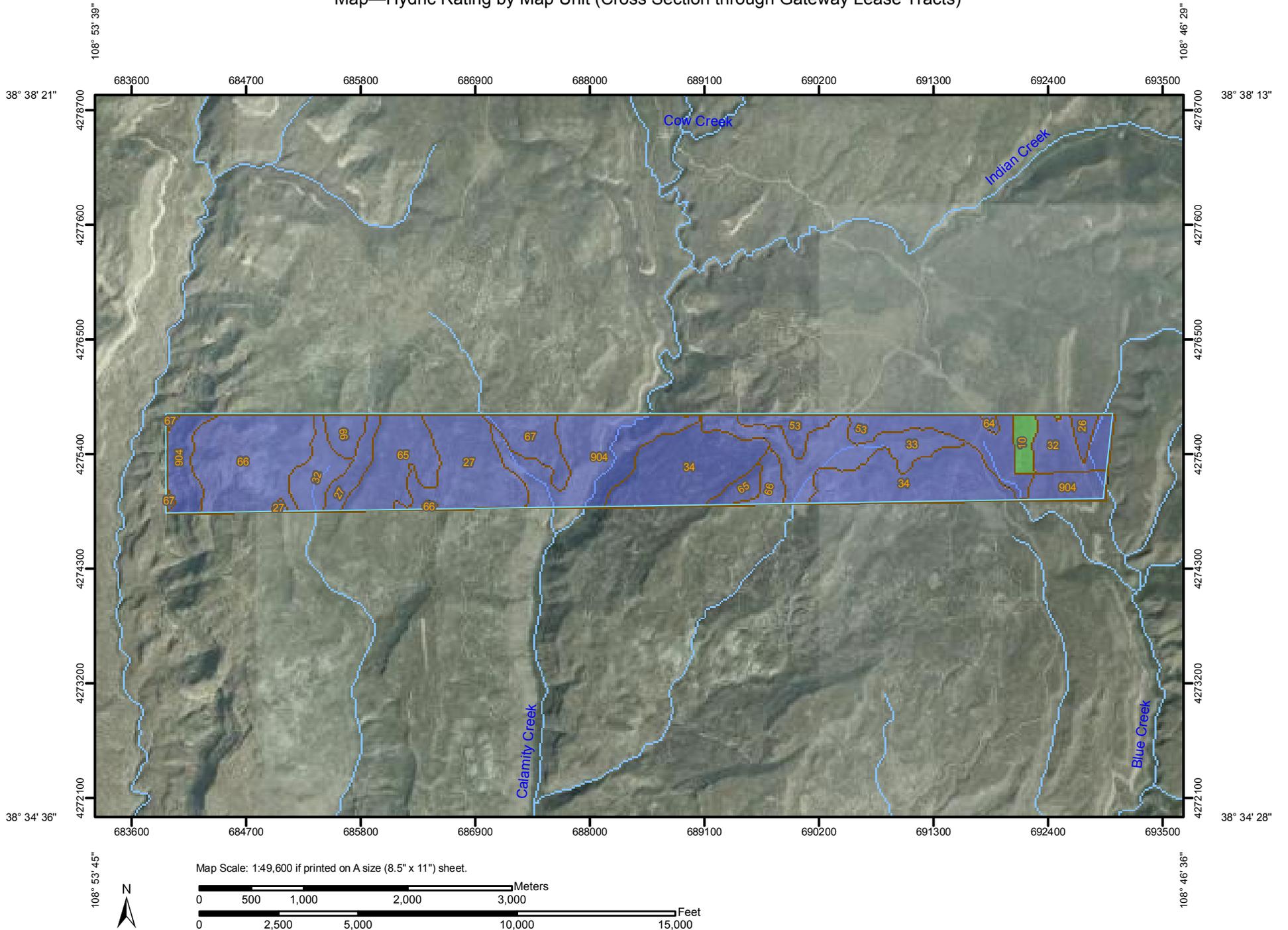
Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18.

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service. U.S. Department of Agriculture Handbook 436.

Soil Survey Staff. 2006. Keys to soil taxonomy. 10th edition. U.S. Department of Agriculture, Natural Resources Conservation Service.

Custom Soil Resource Report

Map—Hydric Rating by Map Unit (Cross Section through Gateway Lease Tracts)



Custom Soil Resource Report

MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Units

Soil Ratings

 All Hydric

 Partially Hydric

 Not Hydric

 Unknown Hydric

 Not rated or not available

Political Features

 Cities

Water Features

 Streams and Canals

Transportation

 Rails

 Interstate Highways

 US Routes

 Major Roads

MAP INFORMATION

Map Scale: 1:49,600 if printed on A size (8.5" × 11") sheet.

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for accurate map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>
Coordinate System: UTM Zone 12N NAD83

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Mesa County Area, Colorado
Survey Area Data: Version 3, Sep 25, 2007

Soil Survey Area: Uncompahgre National Forest Area, Colorado,
Parts of Mesa, Montrose, Ouray, and San Miguel Counties
Survey Area Data: Version 6, Mar 25, 2008

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

Date(s) aerial images were photographed: 8/28/2005

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Custom Soil Resource Report

Table—Hydric Rating by Map Unit (Cross Section through Gateway Lease Tracts)

Hydric Rating by Map Unit— Summary by Map Unit — Mesa County Area, Colorado (CO680)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
27	Rock outcrop-Biedsaw complex, 25 to 65 percent slopes, extremely bouldery	Not Hydric	218.8	11.1%
32	Iles loam, dry, 3 to 12 percent slopes	Not Hydric	65.3	3.3%
33	Fergus-Zoltay complex, 3 to 12 percent slopes	Not Hydric	172.2	8.7%
34	Wrayha-Dollard-Fergus complex, 25 to 65 percent slopes, very stony	Not Hydric	381.6	19.3%
53	Bodot-Mellenthin-Rock outcrop complex, 6 to 65 percent slopes, extremely stony	Not Hydric	152.6	7.7%
64	Barx-Progresso complex, 3 to 12 percent slopes	Not Hydric	5.6	0.3%
65	Progresso-Rock outcrop-Bowdish complex, 3 to 12 percent slopes, stony	Not Hydric	154.9	7.8%
66	Bodot-Sili-Rock outcrop complex, 5 to 25 percent slopes, very bouldery	Not Hydric	293.1	14.8%
67	Gladel-Bond-Rock outcrop complex, 3 to 25 percent slopes	Not Hydric	74.7	3.8%
904	Rock outcrop, 50 to 99 percent slopes	Not Hydric	332.2	16.8%
Subtotals for Soil Survey Area			1,850.9	93.5%
Totals for Area of Interest			1,979.8	100.0%

Hydric Rating by Map Unit— Summary by Map Unit — Uncompahgre National Forest Area, Colorado, Parts of Mesa, Montrose, Ouray, and San Miguel Counties (CO676)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
10	Arabrab-Dalhart families complex, 3 to 15 percent slopes	Partially Hydric	29.4	1.5%
26	Mirand-Callan families-Chilson variant complex, 3 to 20 percent slopes	Not Hydric	17.2	0.9%
32	Ustorthents-Ustochrepts-Rock outcrop complex, 40 to 150 percent slopes	Not Hydric	82.3	4.2%
Subtotals for Soil Survey Area			128.9	6.5%
Totals for Area of Interest			1,979.8	100.0%

Rating Options—Hydric Rating by Map Unit (Cross Section through Gateway Lease Tracts)

Aggregation Method: Absence/Presence

Tie-break Rule: Lower

Nonirrigated Capability Class (Cross Section through Gateway Lease Tracts)

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

In the capability system, soils are generally grouped at three levels—capability class, subclass, and unit. Only class and subclass are included in this data set.

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

Class 1 soils have few limitations that restrict their use.

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

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

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

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

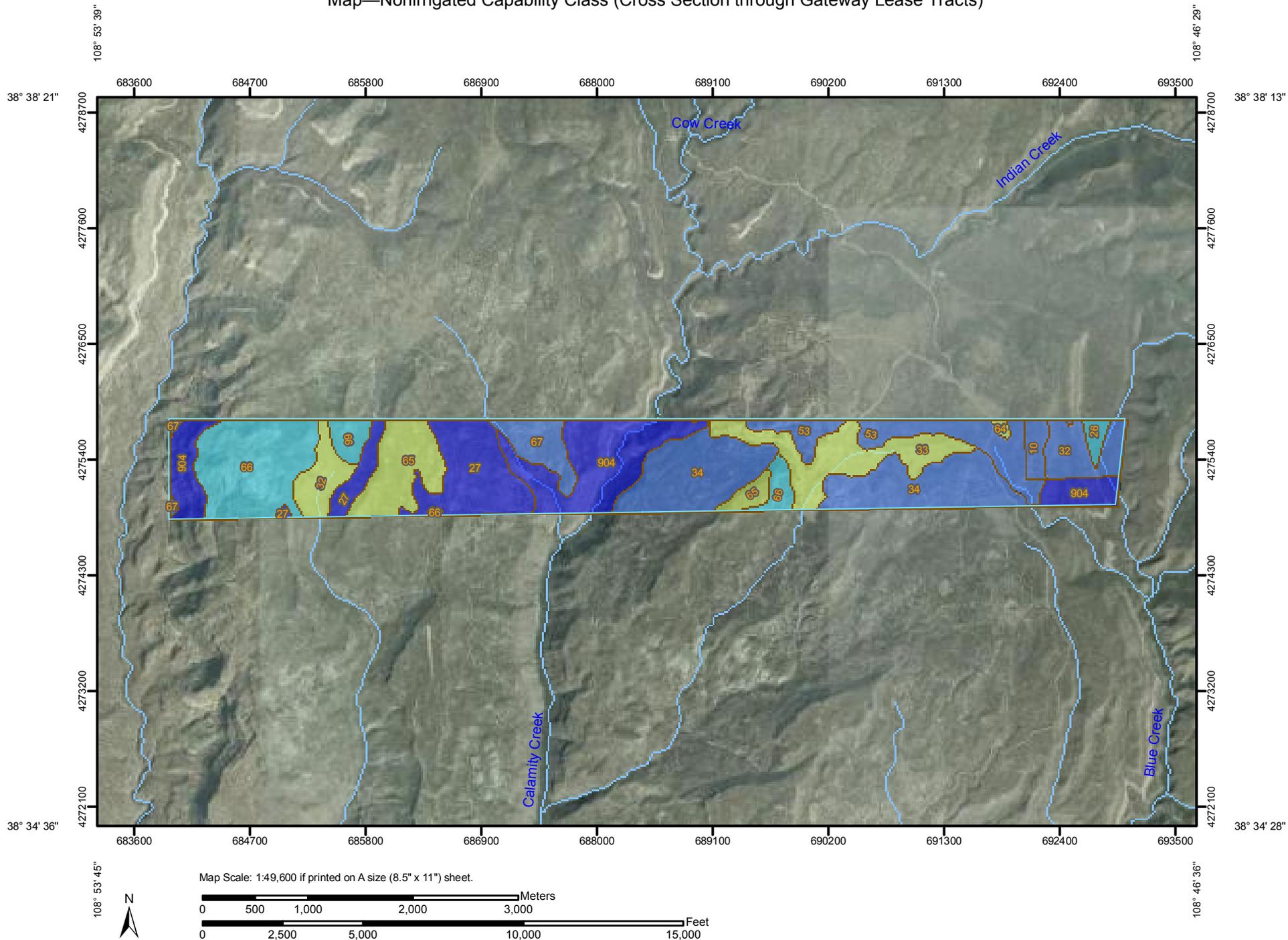
Class 6 soils have severe limitations that make them generally unsuitable for cultivation and that restrict their use mainly to pasture, rangeland, forestland, or wildlife habitat.

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

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

Custom Soil Resource Report
Map—Nonirrigated Capability Class (Cross Section through Gateway Lease Tracts)



Custom Soil Resource Report

MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Units

Soil Ratings

 Capability Class - I

 Capability Class - II

 Capability Class - III

 Capability Class - IV

 Capability Class - V

 Capability Class - VI

 Capability Class - VII

 Capability Class - VIII

 Not rated or not available

Political Features

 Cities

Water Features

 Streams and Canals

Transportation

 Rails

 Interstate Highways

 US Routes

 Major Roads

MAP INFORMATION

Map Scale: 1:49,600 if printed on A size (8.5" x 11") sheet.

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for accurate map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>
Coordinate System: UTM Zone 12N NAD83

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Mesa County Area, Colorado
Survey Area Data: Version 3, Sep 25, 2007

Soil Survey Area: Uncompahgre National Forest Area, Colorado,
Parts of Mesa, Montrose, Ouray, and San Miguel Counties
Survey Area Data: Version 6, Mar 25, 2008

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

Date(s) aerial images were photographed: 8/28/2005

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—Nonirrigated Capability Class (Cross Section through Gateway Lease Tracts)

Nonirrigated Capability Class— Summary by Map Unit — Mesa County Area, Colorado (CO680)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
27	Rock outcrop-Biedsaw complex, 25 to 65 percent slopes, extremely bouldery	8	218.8	11.1%
32	Iles loam, dry, 3 to 12 percent slopes	4	65.3	3.3%
33	Fergus-Zoltay complex, 3 to 12 percent slopes	4	172.2	8.7%
34	Wrayha-Dollard-Fergus complex, 25 to 65 percent slopes, very stony	7	381.6	19.3%
53	Bodot-Mellenthin-Rock outcrop complex, 6 to 65 percent slopes, extremely stony	7	152.6	7.7%
64	Barx-Progresso complex, 3 to 12 percent slopes	4	5.6	0.3%
65	Progresso-Rock outcrop-Bowdish complex, 3 to 12 percent slopes, stony	4	154.9	7.8%
66	Bodot-Sili-Rock outcrop complex, 5 to 25 percent slopes, very bouldery	6	293.1	14.8%
67	Gladel-Bond-Rock outcrop complex, 3 to 25 percent slopes	7	74.7	3.8%
904	Rock outcrop, 50 to 99 percent slopes	8	332.2	16.8%
Subtotals for Soil Survey Area			1,850.9	93.5%
Totals for Area of Interest			1,979.8	100.0%

Nonirrigated Capability Class— Summary by Map Unit — Uncompahgre National Forest Area, Colorado, Parts of Mesa, Montrose, Ouray, and San Miguel Counties (CO676)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
10	Arabrab-Dalhart families complex, 3 to 15 percent slopes	7	29.4	1.5%
26	Mirand-Callan families-Chilson variant complex, 3 to 20 percent slopes	6	17.2	0.9%
32	Ustorthents-Ustochrepts-Rock outcrop complex, 40 to 150 percent slopes	7	82.3	4.2%
Subtotals for Soil Survey Area			128.9	6.5%
Totals for Area of Interest			1,979.8	100.0%

Rating Options—Nonirrigated Capability Class (Cross Section through Gateway Lease Tracts)

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Soil Taxonomy Classification (Cross Section through Gateway Lease Tracts)

This rating presents the taxonomic classification based on Soil Taxonomy.

The system of soil classification used by the National Cooperative Soil Survey has six categories (Soil Survey Staff, 1999 and 2003). Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or from laboratory measurements. This table shows the classification of the soils in the survey area. The categories are defined in the following paragraphs.

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

SUBORDER. Each order is divided into suborders primarily on the basis of properties that influence soil genesis and are important to plant growth or properties that reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is Udalfs (Ud, meaning humid, plus alfs, from Alfisols).

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; type of saturation; and base status. Each great group is identified by the name of a suborder and by a prefix that indicates a property of the soil. An example is Hapludalfs (Hapl, meaning minimal horizonation, plus udalfs, the suborder of the Alfisols that has a udic moisture regime).

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

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

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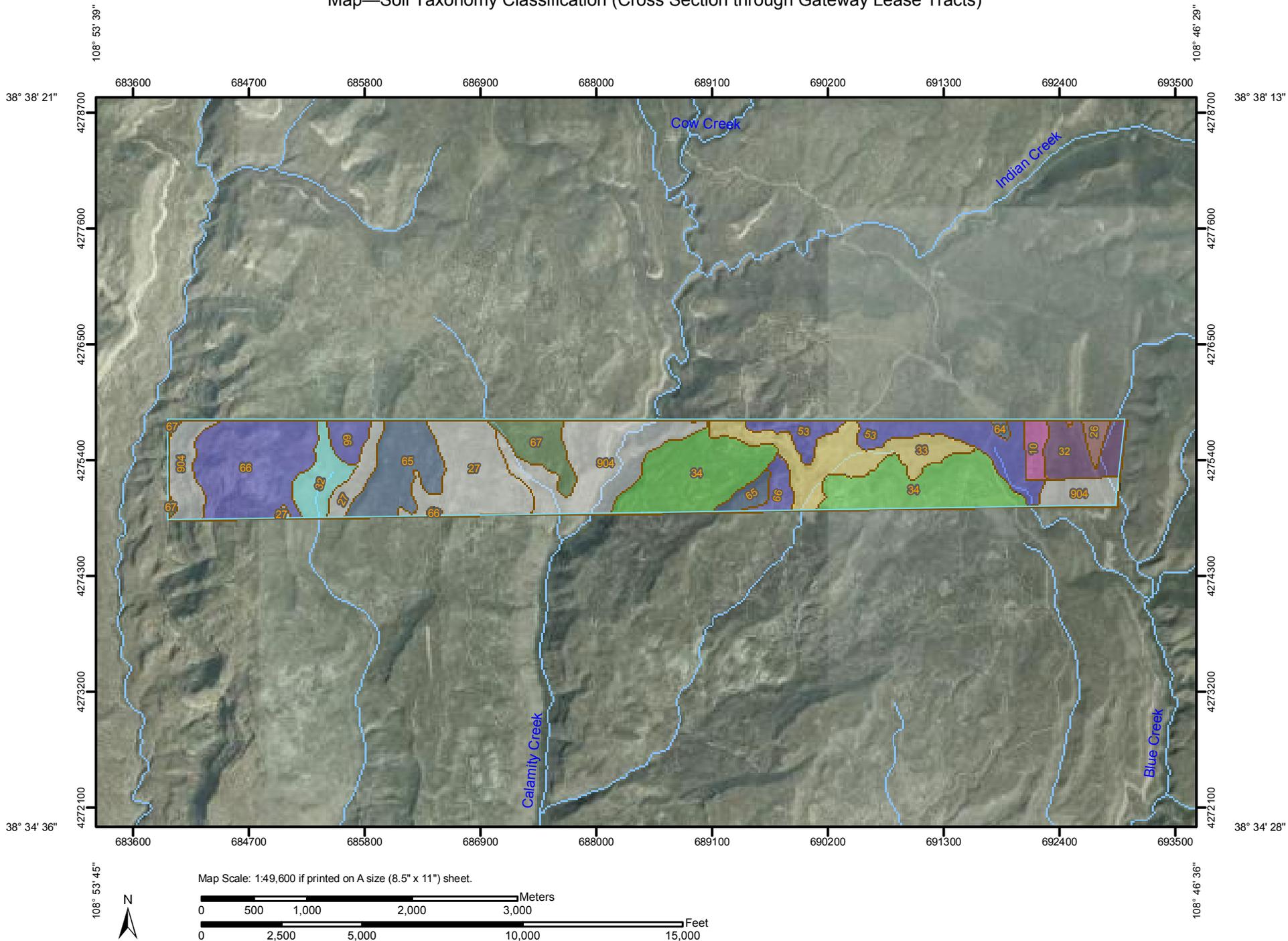
SERIES. The series consists of soils within a family that have horizons similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile.

References:

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service. U.S. Department of Agriculture Handbook 436.

Soil Survey Staff. 2006. Keys to soil taxonomy. 10th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. (The soils in a given survey area may have been classified according to earlier editions of this publication.)

Custom Soil Resource Report
Map—Soil Taxonomy Classification (Cross Section through Gateway Lease Tracts)



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MAP LEGEND

	Area of Interest (AOI)		Not rated or not available
Soils		Political Features	
	Soil Map Units		Cities
Soil Ratings		Water Features	
	Fine, mixed Mollic Eutroboralfs		Streams and Canals
	Fine, smectitic, calcareous, frigid Ustic Torriorthents	Transportation	
	Fine, smectitic, calcareous, mesic Torriertic Ustorthents		Rails
	Fine, smectitic, frigid Calcic Haplustalfs		Interstate Highways
	Fine, smectitic, frigid Vertic Argiustolls		US Routes
	Fine-loamy, mixed, superactive, mesic Ustic Calciargids		Major Roads
	Loamy, mixed, mesic Lithic Haplustalfs		
	Loamy, mixed, superactive, mesic Aridic Lithic Haplustepts		
	Ustorthents		

MAP INFORMATION

Map Scale: 1:49,600 if printed on A size (8.5" x 11") sheet.

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for accurate map measurements.

Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>
 Coordinate System: UTM Zone 12N NAD83

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Mesa County Area, Colorado
 Survey Area Data: Version 3, Sep 25, 2007

Soil Survey Area: Uncompahgre National Forest Area, Colorado, Parts of Mesa, Montrose, Ouray, and San Miguel Counties
 Survey Area Data: Version 6, Mar 25, 2008

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

Date(s) aerial images were photographed: 8/28/2005

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—Soil Taxonomy Classification (Cross Section through Gateway Lease Tracts)

Soil Taxonomy Classification— Summary by Map Unit — Mesa County Area, Colorado (CO680)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
27	Rock outcrop-Biedsaw complex, 25 to 65 percent slopes, extremely bouldery		218.8	11.1%
32	lles loam, dry, 3 to 12 percent slopes	Fine, smectitic, frigid Calcic Haplustalfs	65.3	3.3%
33	Fergus-Zoltay complex, 3 to 12 percent slopes	Fine, smectitic, frigid Vertic Argiustolls	172.2	8.7%
34	Wrayha-Dollard-Fergus complex, 25 to 65 percent slopes, very stony	Fine, smectitic, calcareous, frigid Ustic Torriorthents	381.6	19.3%
53	Bodot-Mellenthin-Rock outcrop complex, 6 to 65 percent slopes, extremely stony	Fine, smectitic, calcareous, mesic Torrertic Ustorthents	152.6	7.7%
64	Barx-Progresso complex, 3 to 12 percent slopes	Fine-loamy, mixed, superactive, mesic Ustic Calciargids	5.6	0.3%
65	Progresso-Rock outcrop-Bowdish complex, 3 to 12 percent slopes, stony	Fine-loamy, mixed, superactive, mesic Ustic Calciargids	154.9	7.8%
66	Bodot-Sili-Rock outcrop complex, 5 to 25 percent slopes, very bouldery	Fine, smectitic, calcareous, mesic Torrertic Ustorthents	293.1	14.8%
67	Gladel-Bond-Rock outcrop complex, 3 to 25 percent slopes	Loamy, mixed, superactive, mesic Aridic Lithic Haplustepts	74.7	3.8%
904	Rock outcrop, 50 to 99 percent slopes		332.2	16.8%
Subtotals for Soil Survey Area			1,850.9	93.5%
Totals for Area of Interest			1,979.8	100.0%

Soil Taxonomy Classification— Summary by Map Unit — Uncompahgre National Forest Area, Colorado, Parts of Mesa, Montrose, Ouray, and San Miguel Counties (CO676)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
10	Arabrab-Dalhart families complex, 3 to 15 percent slopes	Loamy, mixed, mesic Lithic Haplustalfs	29.4	1.5%
26	Mirand-Callan families-Chilson variant complex, 3 to 20 percent slopes	Fine, mixed Mollic Eutroboralfs	17.2	0.9%
32	Ustorthents-Ustochrepts-Rock outcrop complex, 40 to 150 percent slopes	Ustorthents	82.3	4.2%
Subtotals for Soil Survey Area			128.9	6.5%
Totals for Area of Interest			1,979.8	100.0%

Rating Options—Soil Taxonomy Classification (Cross Section through Gateway Lease Tracts)

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Lower

Land Management

Land management interpretations are tools designed to guide the user in evaluating existing conditions in planning and predicting the soil response to various land management practices, for a variety of land uses, including cropland, forestland, hayland, pastureland, horticulture, and rangeland. Example interpretations include suitability for a variety of irrigation practices, log landings, haul roads and major skid trails, equipment operability, site preparation, suitability for hand and mechanical planting, potential erosion hazard associated with various practices, and ratings for fencing and waterline installation.

Erosion Hazard (Off-Road, Off-Trail) (Cross Section through Gateway Lease Tracts)

The ratings in this interpretation indicate the hazard of soil loss from off-road and off-trail areas after disturbance activities that expose the soil surface. The ratings are based on slope and soil erosion factor K. The soil loss is caused by sheet or rill erosion in off-road or off-trail areas where 50 to 75 percent of the surface has been exposed by logging, grazing, mining, or other kinds of disturbance.

The ratings are both verbal and numerical. The hazard is described as "slight," "moderate," "severe," or "very severe." A rating of "slight" indicates that erosion is unlikely under ordinary climatic conditions; "moderate" indicates that some erosion is likely and that erosion-control measures may be needed; "severe" indicates that erosion is very likely and that erosion-control measures, including revegetation of bare areas, are advised; and "very severe" indicates that significant erosion is expected, loss of soil productivity and off-site damage are likely, and erosion-control measures are costly and generally impractical.

Numerical ratings indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the specified aspect of forestland management (1.00) and the point at which the soil feature is not a limitation (0.00).

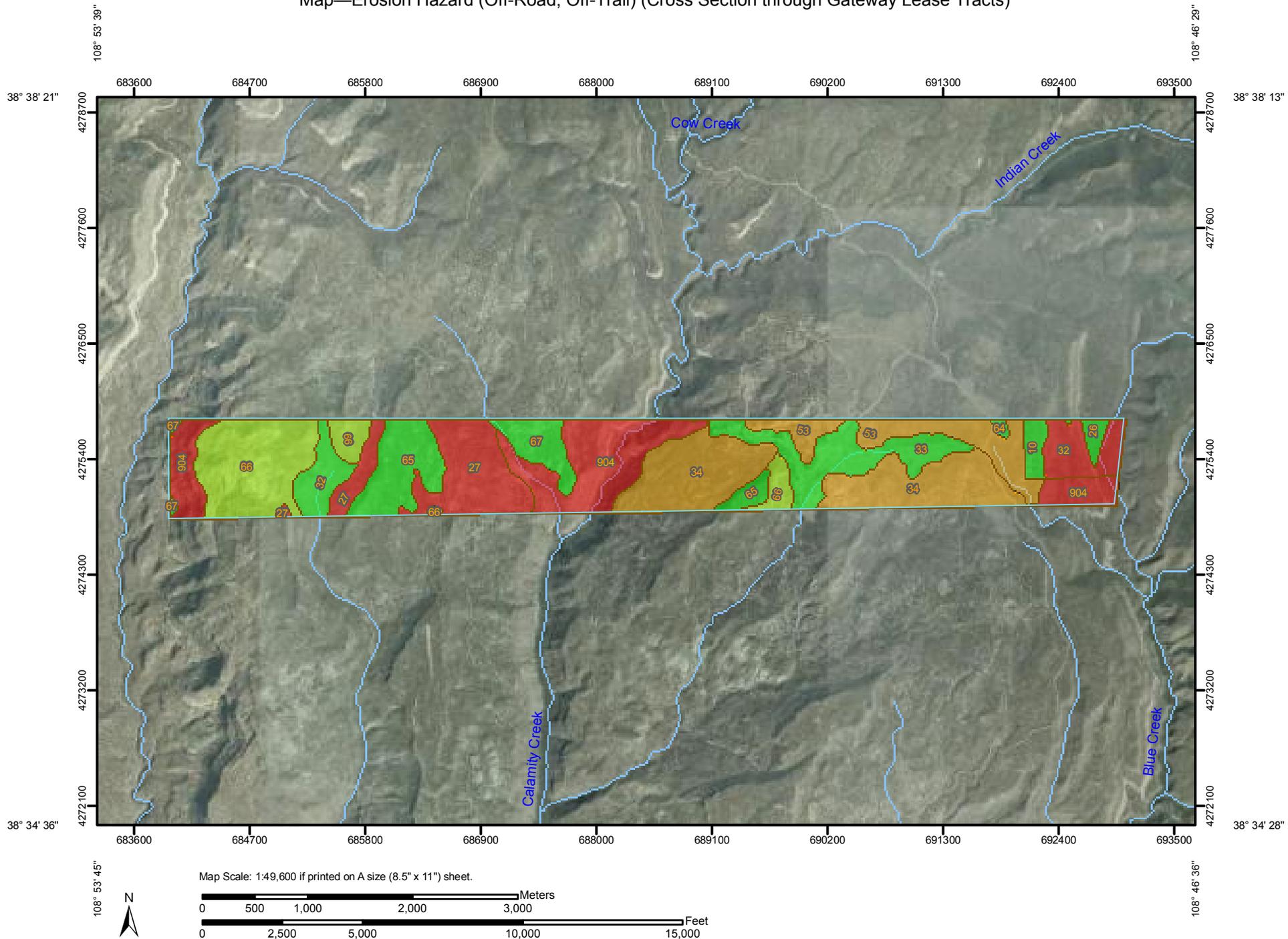
The map unit components listed for each map unit in the accompanying Summary by Map Unit table in Web Soil Survey or the Aggregation Report in Soil Data Viewer are determined by the aggregation method chosen. An aggregated rating class is shown for each map unit. The components listed for each map unit are only those that have

Custom Soil Resource Report

the same rating class as listed for the map unit. The percent composition of each component in a particular map unit is presented to help the user better understand the percentage of each map unit that has the rating presented.

Other components with different ratings may be present in each map unit. The ratings for all components, regardless of the map unit aggregated rating, can be viewed by generating the equivalent report from the Soil Reports tab in Web Soil Survey or from the Soil Data Mart site. Onsite investigation may be needed to validate these interpretations and to confirm the identity of the soil on a given site.

Custom Soil Resource Report
Map—Erosion Hazard (Off-Road, Off-Trail) (Cross Section through Gateway Lease Tracts)



Custom Soil Resource Report

MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Units

Soil Ratings

 Very severe

 Severe

 Moderate

 Slight

 Not rated or not available

Political Features

 Cities

Water Features

 Streams and Canals

Transportation

 Rails

 Interstate Highways

 US Routes

 Major Roads

MAP INFORMATION

Map Scale: 1:49,600 if printed on A size (8.5" x 11") sheet.

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for accurate map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>
Coordinate System: UTM Zone 12N NAD83

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Mesa County Area, Colorado
Survey Area Data: Version 3, Sep 25, 2007

Soil Survey Area: Uncompahgre National Forest Area, Colorado,
Parts of Mesa, Montrose, Ouray, and San Miguel Counties
Survey Area Data: Version 6, Mar 25, 2008

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

Date(s) aerial images were photographed: 8/28/2005

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Custom Soil Resource Report

Tables—Erosion Hazard (Off-Road, Off-Trail) (Cross Section through Gateway Lease Tracts)

Erosion Hazard (Off-Road, Off-Trail)— Summary by Map Unit — Mesa County Area, Colorado (CO680)						
Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
27	Rock outcrop-Biedsaw complex, 25 to 65 percent slopes, extremely bouldery	Very severe	Rock outcrop (55%)	Slope/erodibility (0.95)	218.8	11.1%
				Slope/erodibility (0.75)		
32	lles loam, dry, 3 to 12 percent slopes	Slight	lles, dry (90%)		65.3	3.3%
33	Fergus-Zoltay complex, 3 to 12 percent slopes	Slight	Fergus (45%)		172.2	8.7%
			Zoltay (40%)			
34	Wrayha-Dollard-Fergus complex, 25 to 65 percent slopes, very stony	Severe	Wrayha (35%)	Slope/erodibility (0.75)	381.6	19.3%
			Dollard (30%)	Slope/erodibility (0.75)		
			Fergus (20%)	Slope/erodibility (0.75)		
53	Bodot-Mellenthin-Rock outcrop complex, 6 to 65 percent slopes, extremely stony	Severe	Mellenthin (25%)	Slope/erodibility (0.75)	152.6	7.7%
			Rock outcrop (20%)	Slope/erodibility (0.75)		
				Slope/erodibility (0.75)		
64	Barx-Progresso complex, 3 to 12 percent slopes	Slight	Barx (45%)		5.6	0.3%
			Progresso (40%)			
65	Progresso-Rock outcrop-Bowdish complex, 3 to 12 percent slopes, stony	Slight	Progresso (35%)		154.9	7.8%
			Rock outcrop (30%)			
			Bowdish (25%)			
66	Bodot-Sili-Rock outcrop complex, 5 to 25 percent slopes, very bouldery	Moderate	Bodot (45%)	Slope/erodibility (0.50)	293.1	14.8%
			Sili (25%)	Slope/erodibility (0.50)		
			Rock outcrop (20%)	Slope/erodibility (0.50)		
				Slope/erodibility (0.50)		
67	Gladel-Bond-Rock outcrop complex, 3 to 25 percent slopes	Slight	Gladel (40%)		74.7	3.8%
			Bond (30%)			
904	Rock outcrop, 50 to 99 percent slopes	Very severe	Rock outcrop (80%)	Slope/erodibility (0.95)	332.2	16.8%
				Slope/erodibility (0.95)		
Subtotals for Soil Survey Area					1,850.9	93.5%
Totals for Area of Interest					1,979.8	100.0%

Custom Soil Resource Report

Erosion Hazard (Off-Road, Off-Trail)— Summary by Map Unit — Uncompahgre National Forest Area, Colorado, Parts of Mesa, Montrose, Ouray, and San Miguel Counties (CO676)						
Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
10	Arabrab-Dalhart families complex, 3 to 15 percent slopes	Slight	Arabrab family (50%)		29.4	1.5%
			Dalhart family (40%)			
26	Mirand-Callan families-Chilson variant complex, 3 to 20 percent slopes	Slight	Mirand family (45%)		17.2	0.9%
			Callan family (25%)			
			Chilson variant (15%)			
32	Ustorhents-Ustochrepts-Rock outcrop complex, 40 to 150 percent slopes	Very severe	Ustorhents (40%)	Slope/erodibility (0.95)	82.3	4.2%
			Ustochrepts (30%)	Slope/erodibility (0.95)		
				Slope/erodibility (0.95)		
			Rock outcrop (20%)	Slope/erodibility (0.95)		
Subtotals for Soil Survey Area					128.9	6.5%
Totals for Area of Interest					1,979.8	100.0%

Erosion Hazard (Off-Road, Off-Trail)— Summary by Rating Value		
Rating	Acres in AOI	Percent of AOI
Very severe	633.3	32.0%
Severe	534.2	27.0%
Slight	519.2	26.2%
Moderate	293.1	14.8%
Totals for Area of Interest	1,979.8	100.0%

Rating Options—Erosion Hazard (Off-Road, Off-Trail) (Cross Section through Gateway Lease Tracts)

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Erosion Hazard (Road, Trail) (Cross Section through Gateway Lease Tracts)

The ratings in this interpretation indicate the hazard of soil loss from unsurfaced roads and trails. The ratings are based on soil erosion factor K, slope, and content of rock fragments.

The ratings are both verbal and numerical. The hazard is described as "slight," "moderate," or "severe." A rating of "slight" indicates that little or no erosion is likely;

Custom Soil Resource Report

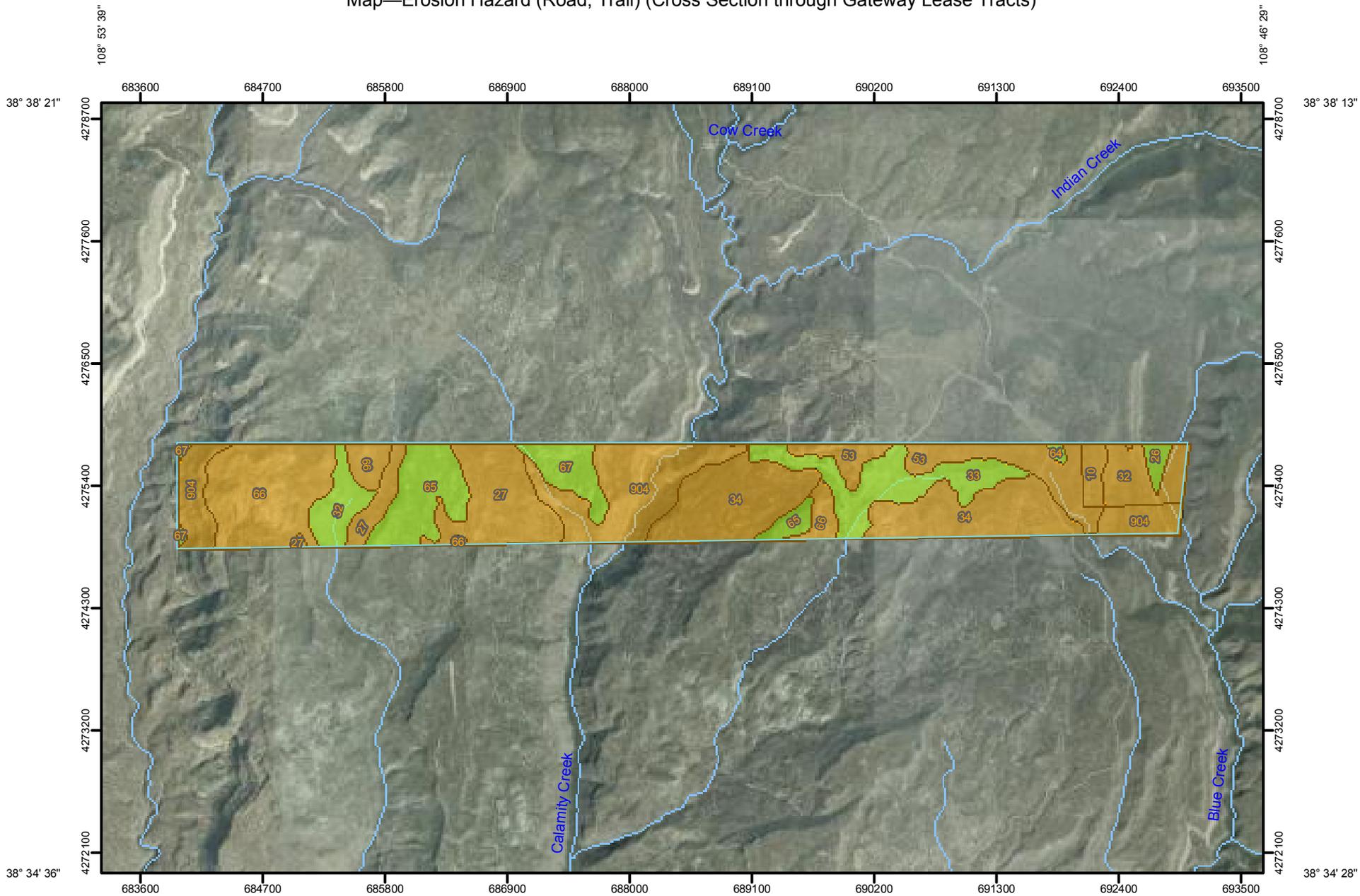
"moderate" indicates that some erosion is likely, that the roads or trails may require occasional maintenance, and that simple erosion-control measures are needed; and "severe" indicates that significant erosion is expected, that the roads or trails require frequent maintenance, and that costly erosion-control measures are needed.

Numerical ratings indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the specified aspect of forestland management (1.00) and the point at which the soil feature is not a limitation (0.00).

The map unit components listed for each map unit in the accompanying Summary by Map Unit table in Web Soil Survey or the Aggregation Report in Soil Data Viewer are determined by the aggregation method chosen. An aggregated rating class is shown for each map unit. The components listed for each map unit are only those that have the same rating class as listed for the map unit. The percent composition of each component in a particular map unit is presented to help the user better understand the percentage of each map unit that has the rating presented.

Other components with different ratings may be present in each map unit. The ratings for all components, regardless of the map unit aggregated rating, can be viewed by generating the equivalent report from the Soil Reports tab in Web Soil Survey or from the Soil Data Mart site. Onsite investigation may be needed to validate these interpretations and to confirm the identity of the soil on a given site.

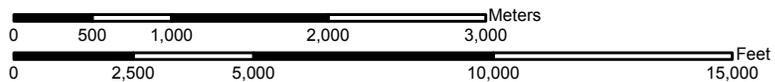
Custom Soil Resource Report
Map—Erosion Hazard (Road, Trail) (Cross Section through Gateway Lease Tracts)



108° 53' 45"



Map Scale: 1:49,600 if printed on A size (8.5" x 11") sheet.



108° 46' 36"

Custom Soil Resource Report

MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Units

Soil Ratings

 Very severe

 Severe

 Moderate

 Slight

 Not rated or not available

Political Features

 Cities

Water Features

 Streams and Canals

Transportation

 Rails

 Interstate Highways

 US Routes

 Major Roads

MAP INFORMATION

Map Scale: 1:49,600 if printed on A size (8.5" x 11") sheet.

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for accurate map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>
Coordinate System: UTM Zone 12N NAD83

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Mesa County Area, Colorado
Survey Area Data: Version 3, Sep 25, 2007

Soil Survey Area: Uncompahgre National Forest Area, Colorado,
Parts of Mesa, Montrose, Ouray, and San Miguel Counties
Survey Area Data: Version 6, Mar 25, 2008

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

Date(s) aerial images were photographed: 8/28/2005

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Custom Soil Resource Report

Tables—Erosion Hazard (Road, Trail) (Cross Section through Gateway Lease Tracts)

Erosion Hazard (Road, Trail)— Summary by Map Unit — Mesa County Area, Colorado (CO680)						
Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
27	Rock outcrop-Biedsaw complex, 25 to 65 percent slopes, extremely bouldery	Severe	Rock outcrop (55%)	Slope/erodibility (0.95)	218.8	11.1%
				Slope/erodibility (0.95)		
			Biedsaw (30%)	Slope/erodibility (0.95)		
32	Iles loam, dry, 3 to 12 percent slopes	Moderate	Iles, dry (90%)	Slope/erodibility (0.50)	65.3	3.3%
33	Fergus-Zoltay complex, 3 to 12 percent slopes	Moderate	Fergus (45%)	Slope/erodibility (0.50)	172.2	8.7%
			Zoltay (40%)	Slope/erodibility (0.50)		
34	Wrayha-Dollard-Fergus complex, 25 to 65 percent slopes, very stony	Severe	Wrayha (35%)	Slope/erodibility (0.95)	381.6	19.3%
			Dollard (30%)	Slope/erodibility (0.95)		
			Fergus (20%)	Slope/erodibility (0.95)		
53	Bodot-Mellenthin-Rock outcrop complex, 6 to 65 percent slopes, extremely stony	Severe	Bodot (45%)	Slope/erodibility (0.95)	152.6	7.7%
			Mellenthin (25%)	Slope/erodibility (0.95)		
			Rock outcrop (20%)	Slope/erodibility (0.95)		
				Slope/erodibility (0.95)		
64	Barx-Progresso complex, 3 to 12 percent slopes	Moderate	Barx (45%)	Slope/erodibility (0.50)	5.6	0.3%
			Progresso (40%)	Slope/erodibility (0.50)		
65	Progresso-Rock outcrop-Bowdish complex, 3 to 12 percent slopes, stony	Moderate	Progresso (35%)	Slope/erodibility (0.50)	154.9	7.8%
			Rock outcrop (30%)	Slope/erodibility (0.50)		
				Slope/erodibility (0.50)		
66	Bodot-Sili-Rock outcrop complex, 5 to 25 percent slopes, very bouldery	Severe	Bodot (45%)	Slope/erodibility (0.95)	293.1	14.8%
			Sili (25%)	Slope/erodibility (0.95)		
			Rock outcrop (20%)	Slope/erodibility (0.95)		
67	Gladel-Bond-Rock outcrop complex, 3 to 25 percent slopes	Moderate	Gladel (40%)	Slope/erodibility (0.50)	74.7	3.8%
			Bond (30%)	Slope/erodibility (0.50)		
904	Rock outcrop, 50 to 99 percent slopes	Severe	Rock outcrop (80%)	Slope/erodibility (0.95)	332.2	16.8%
				Slope/erodibility (0.95)		
Subtotals for Soil Survey Area					1,850.9	93.5%
Totals for Area of Interest					1,979.8	100.0%

Custom Soil Resource Report

Erosion Hazard (Road, Trail)— Summary by Map Unit — Uncompahgre National Forest Area, Colorado, Parts of Mesa, Montrose, Ouray, and San Miguel Counties (CO676)						
Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
10	Arabrab-Dalhart families complex, 3 to 15 percent slopes	Severe	Arabrab family (50%)	Slope/erodibility (0.95)	29.4	1.5%
			Dalhart family (40%)	Slope/erodibility (0.95)		
26	Mirand-Callan families-Chilson variant complex, 3 to 20 percent slopes	Moderate	Mirand family (45%)	Slope/erodibility (0.50)	17.2	0.9%
			Callan family (25%)	Slope/erodibility (0.50)		
			Chilson variant (15%)	Slope/erodibility (0.50)		
32	Ustorhents-Ustochrepts-Rock outcrop complex, 40 to 150 percent slopes	Severe	Ustorhents (40%)	Slope/erodibility (0.95)	82.3	4.2%
			Ustochrepts (30%)	Slope/erodibility (0.95)		
				Slope/erodibility (0.95)		
			Rock outcrop (20%)	Slope/erodibility (0.95)		
Subtotals for Soil Survey Area					128.9	6.5%
Totals for Area of Interest					1,979.8	100.0%

Erosion Hazard (Road, Trail)— Summary by Rating Value		
Rating	Acres in AOI	Percent of AOI
Severe	1,490.0	75.3%
Moderate	489.8	24.7%
Totals for Area of Interest	1,979.8	100.0%

Rating Options—Erosion Hazard (Road, Trail) (Cross Section through Gateway Lease Tracts)

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Soil Rutting Hazard (Cross Section through Gateway Lease Tracts)

The ratings in this interpretation indicate the hazard of surface rut formation through the operation of forestland equipment. Soil displacement and puddling (soil deformation and compaction) may occur simultaneously with rutting.

Ratings are based on depth to a water table, rock fragments on or below the surface, the Unified classification of the soil, depth to a restrictive layer, and slope. The hazard is described as slight, moderate, or severe. A rating of "slight" indicates that the soil is subject to little or no rutting. "Moderate" indicates that rutting is likely. "Severe" indicates that ruts form readily.

Custom Soil Resource Report

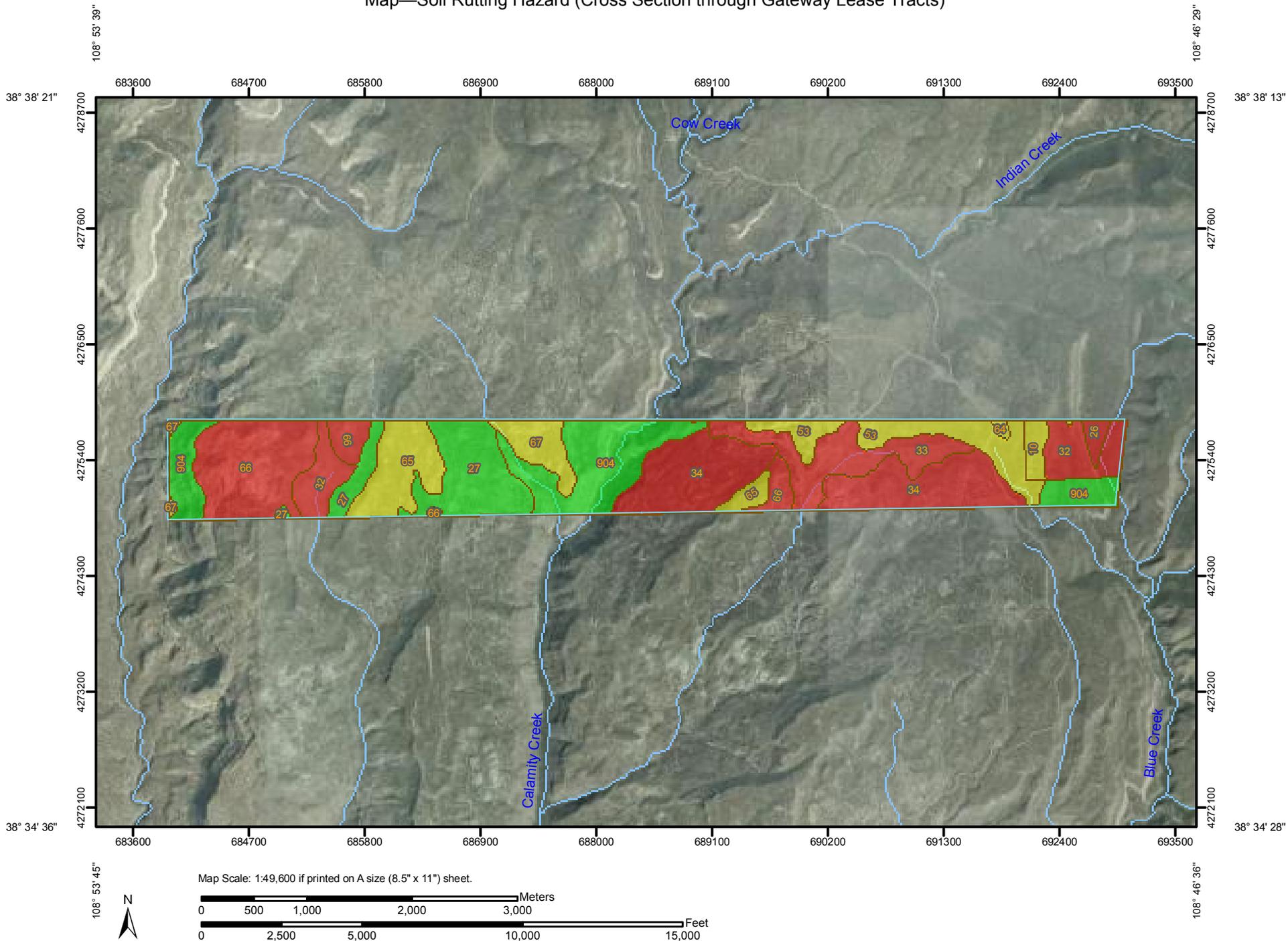
Numerical ratings indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the specified aspect of forestland management (1.00) and the point at which the soil feature is not a limitation (0.00).

The map unit components listed for each map unit in the accompanying Summary by Map Unit table in Web Soil Survey or the Aggregation Report in Soil Data Viewer are determined by the aggregation method chosen. An aggregated rating class is shown for each map unit. The components listed for each map unit are only those that have the same rating class as listed for the map unit. The percent composition of each component in a particular map unit is presented to help the user better understand the percentage of each map unit that has the rating presented.

Other components with different ratings may be present in each map unit. The ratings for all components, regardless of the map unit aggregated rating, can be viewed by generating the equivalent report from the Soil Reports tab in Web Soil Survey or from the Soil Data Mart site. Onsite investigation may be needed to validate these interpretations and to confirm the identity of the soil on a given site.

Custom Soil Resource Report

Map—Soil Rutting Hazard (Cross Section through Gateway Lease Tracts)



Custom Soil Resource Report

MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Units

Soil Ratings

 Severe

 Moderate

 Slight

 Not rated or not available

Political Features

 Cities

Water Features

 Streams and Canals

Transportation

 Rails

 Interstate Highways

 US Routes

 Major Roads

MAP INFORMATION

Map Scale: 1:49,600 if printed on A size (8.5" x 11") sheet.

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for accurate map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>
Coordinate System: UTM Zone 12N NAD83

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Mesa County Area, Colorado
Survey Area Data: Version 3, Sep 25, 2007

Soil Survey Area: Uncompahgre National Forest Area, Colorado,
Parts of Mesa, Montrose, Ouray, and San Miguel Counties
Survey Area Data: Version 6, Mar 25, 2008

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

Date(s) aerial images were photographed: 8/28/2005

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Custom Soil Resource Report

Tables—Soil Rutting Hazard (Cross Section through Gateway Lease Tracts)

Soil Rutting Hazard— Summary by Map Unit — Mesa County Area, Colorado (CO680)						
Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
27	Rock outcrop-Biedsaw complex, 25 to 65 percent slopes, extremely bouldery	Slight	Rock outcrop (55%)		218.8	11.1%
32	lles loam, dry, 3 to 12 percent slopes	Severe	lles, dry (90%)	Low strength (1.00)	65.3	3.3%
33	Fergus-Zoltay complex, 3 to 12 percent slopes	Severe	Fergus (45%)	Low strength (1.00)	172.2	8.7%
			Zoltay (40%)	Low strength (1.00)		
34	Wrayha-Dollard-Fergus complex, 25 to 65 percent slopes, very stony	Severe	Wrayha (35%)	Low strength (1.00)	381.6	19.3%
			Dollard (30%)	Low strength (1.00)		
			Fergus (20%)	Low strength (1.00)		
53	Bodot-Mellenthin-Rock outcrop complex, 6 to 65 percent slopes, extremely stony	Moderate	Bodot (45%)	Low strength (0.50)	152.6	7.7%
			Mellenthin (25%)	Low strength (0.50)		
64	Barx-Progresso complex, 3 to 12 percent slopes	Moderate	Barx (45%)	Low strength (0.50)	5.6	0.3%
			Progresso (40%)	Low strength (0.50)		
65	Progresso-Rock outcrop-Bowdish complex, 3 to 12 percent slopes, stony	Moderate	Progresso (35%)	Low strength (0.50)	154.9	7.8%
			Bowdish (25%)	Low strength (0.50)		
66	Bodot-Sili-Rock outcrop complex, 5 to 25 percent slopes, very bouldery	Severe	Bodot (45%)	Low strength (1.00)	293.1	14.8%
			Sili (25%)	Low strength (1.00)		
67	Gladel-Bond-Rock outcrop complex, 3 to 25 percent slopes	Moderate	Gladel (40%)	Low strength (0.50)	74.7	3.8%
			Bond (30%)	Low strength (0.50)		
904	Rock outcrop, 50 to 99 percent slopes	Slight	Rock outcrop (80%)		332.2	16.8%
Subtotals for Soil Survey Area					1,850.9	93.5%
Totals for Area of Interest					1,979.8	100.0%

Custom Soil Resource Report

Soil Rutting Hazard— Summary by Map Unit — Uncompahgre National Forest Area, Colorado, Parts of Mesa, Montrose, Ouray, and San Miguel Counties (CO676)						
Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
10	Arabrab-Dalhart families complex, 3 to 15 percent slopes	Moderate	Arabrab family (50%)	Low strength (0.50)	29.4	1.5%
			Dalhart family (40%)	Low strength (0.50)		
26	Mirand-Callan families-Chilson variant complex, 3 to 20 percent slopes	Severe	Mirand family (45%)	Low strength (1.00)	17.2	0.9%
			Callan family (25%)	Low strength (1.00)		
32	Ustorthents-Ustochrepts-Rock outcrop complex, 40 to 150 percent slopes	Severe	Ustorthents (40%)	Low strength (1.00)	82.3	4.2%
			Ustochrepts (30%)	Low strength (1.00)		
Subtotals for Soil Survey Area					128.9	6.5%
Totals for Area of Interest					1,979.8	100.0%

Soil Rutting Hazard— Summary by Rating Value		
Rating	Acres in AOI	Percent of AOI
Severe	1,011.6	51.1%
Slight	551.0	27.8%
Moderate	417.1	21.1%
Totals for Area of Interest	1,979.8	100.0%

Rating Options—Soil Rutting Hazard (Cross Section through Gateway Lease Tracts)

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

References

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

National Research Council. 1995. Wetlands: Characteristics and boundaries.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. <http://soils.usda.gov/>

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. <http://soils.usda.gov/>

Soil Survey Staff. 2006. Keys to soil taxonomy. 10th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. <http://soils.usda.gov/>

Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.

United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.

United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. <http://soils.usda.gov/>

United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. <http://www.glti.nrcs.usda.gov/>

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. <http://soils.usda.gov/>

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. <http://soils.usda.gov/>

Custom Soil Resource Report

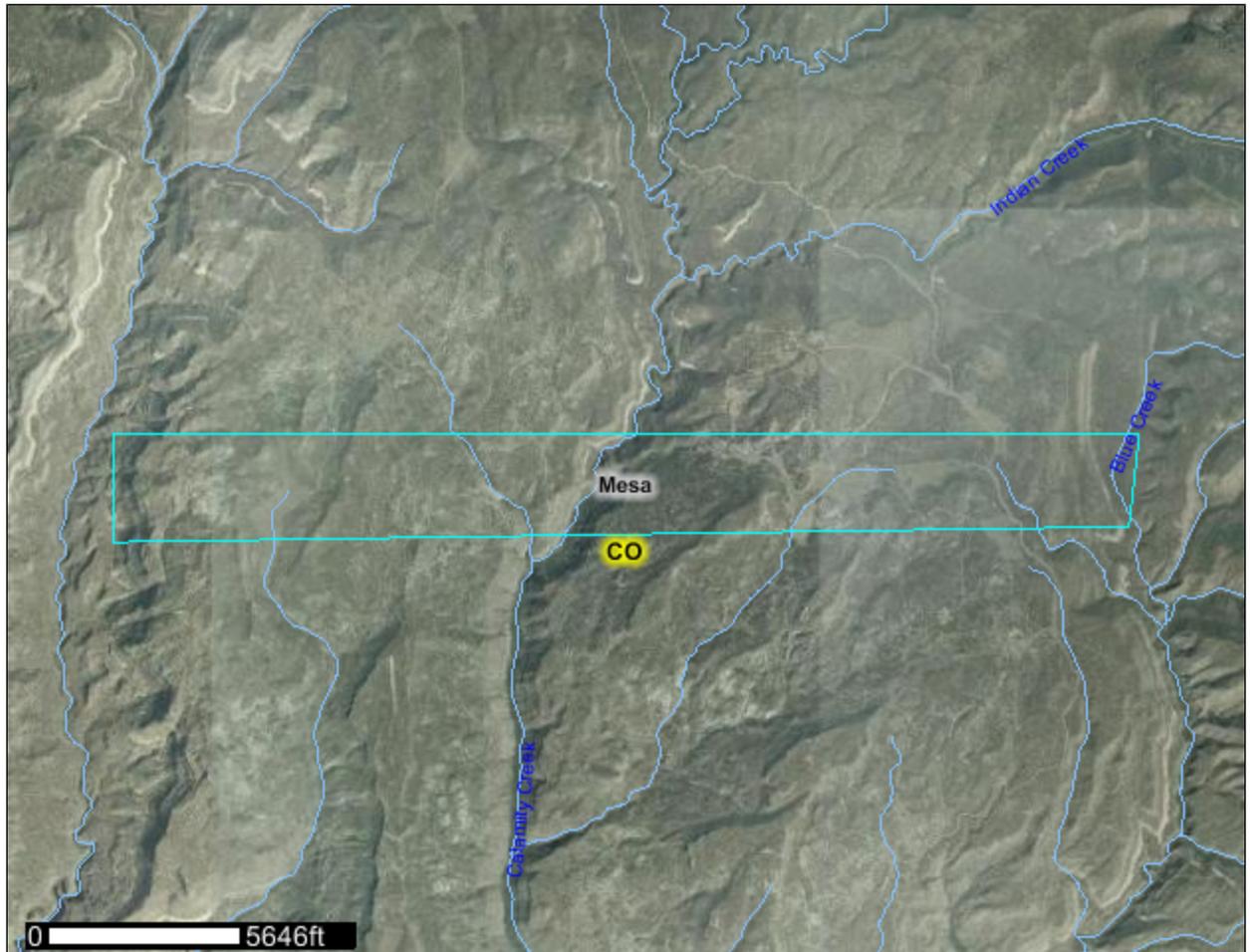
United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210.



A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Mesa County Area, Colorado; and Uncompahgre National Forest Area, Colorado, Parts of Mesa, Montrose, Ouray, and San Miguel Counties

Cross Section through Gateway Lease Tracts (Part 2)



Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

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

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (<http://soils.usda.gov/sqi/>) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (<http://offices.sc.egov.usda.gov/locator/app?agency=nrsc>) or your NRCS State Soil Scientist (http://soils.usda.gov/contact/state_offices/).

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

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Soil Data Mart Web site or the NRCS Web Soil Survey. The Soil Data Mart is the data storage site for the official soil survey information.

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

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

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

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

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individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

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

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

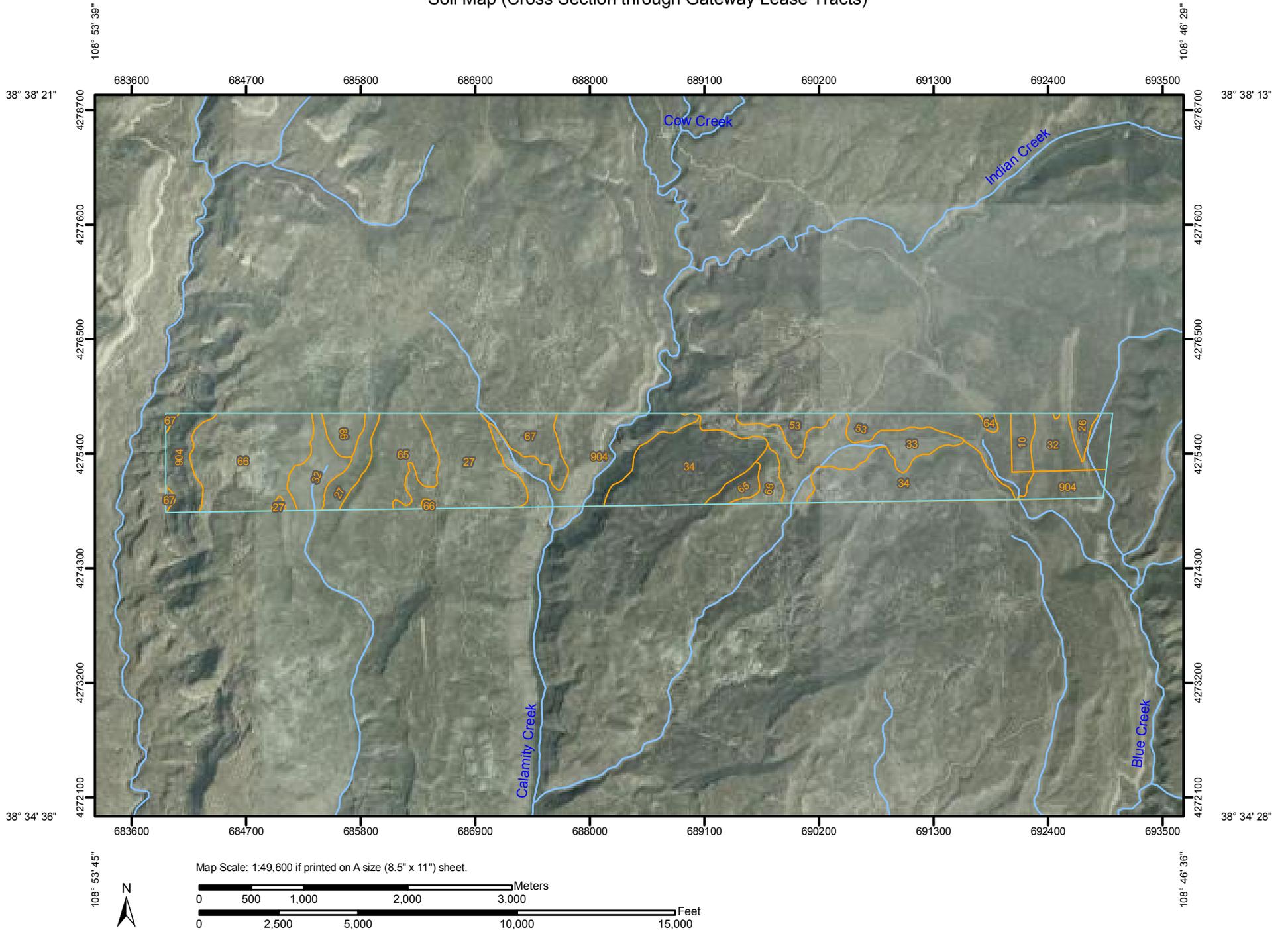
After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in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

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

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Soil Map (Cross Section through Gateway Lease Tracts)



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MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Units

Special Point Features

-  Blowout
-  Borrow Pit
-  Clay Spot
-  Closed Depression
-  Gravel Pit
-  Gravelly Spot
-  Landfill
-  Lava Flow
-  Marsh or swamp
-  Mine or Quarry
-  Miscellaneous Water
-  Perennial Water
-  Rock Outcrop
-  Saline Spot
-  Sandy Spot
-  Severely Eroded Spot
-  Sinkhole
-  Slide or Slip
-  Sodic Spot
-  Spoil Area
-  Stony Spot

 Very Stony Spot

 Wet Spot

 Other

Special Line Features

-  Gully
-  Short Steep Slope
-  Other

Political Features

 Cities

Water Features

 Streams and Canals

Transportation

-  Rails
-  Interstate Highways
-  US Routes
-  Major Roads

MAP INFORMATION

Map Scale: 1:49,600 if printed on A size (8.5" x 11") sheet.

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for accurate map measurements.

Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>
 Coordinate System: UTM Zone 12N NAD83

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Mesa County Area, Colorado
 Survey Area Data: Version 3, Sep 25, 2007

Soil Survey Area: Uncompahgre National Forest Area, Colorado,
 Parts of Mesa, Montrose, Ouray, and San Miguel Counties
 Survey Area Data: Version 6, Mar 25, 2008

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

Date(s) aerial images were photographed: 8/28/2005

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend (Cross Section through Gateway Lease Tracts)

Mesa County Area, Colorado (CO680)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
27	Rock outcrop-Biedsaw complex, 25 to 65 percent slopes, extremely bouldery	218.8	11.1%
32	Iles loam, dry, 3 to 12 percent slopes	65.3	3.3%
33	Fergus-Zoltay complex, 3 to 12 percent slopes	172.2	8.7%
34	Wrayha-Dollard-Fergus complex, 25 to 65 percent slopes, very stony	381.6	19.3%
53	Bodot-Mellenthin-Rock outcrop complex, 6 to 65 percent slopes, extremely stony	152.6	7.7%
64	Barx-Progresso complex, 3 to 12 percent slopes	5.6	0.3%
65	Progresso-Rock outcrop-Bowdish complex, 3 to 12 percent slopes, stony	154.9	7.8%
66	Bodot-Sili-Rock outcrop complex, 5 to 25 percent slopes, very bouldery	293.1	14.8%
67	Gladel-Bond-Rock outcrop complex, 3 to 25 percent slopes	74.7	3.8%
904	Rock outcrop, 50 to 99 percent slopes	332.2	16.8%
Subtotals for Soil Survey Area		1,850.9	93.5%
Totals for Area of Interest		1,979.8	100.0%

Uncompahgre National Forest Area, Colorado, Parts of Mesa, Montrose, Ouray, and San Miguel Counties (CO676)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
10	Arabrab-Dalhart families complex, 3 to 15 percent slopes	29.4	1.5%
26	Mirand-Callan families-Chilson variant complex, 3 to 20 percent slopes	17.2	0.9%
32	Ustorhents-Ustochrepts-Rock outcrop complex, 40 to 150 percent slopes	82.3	4.2%
Subtotals for Soil Survey Area		128.9	6.5%
Totals for Area of Interest		1,979.8	100.0%

Map Unit Descriptions (Cross Section through Gateway Lease Tracts)

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

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

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

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

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

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

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

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

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

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An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Mesa County Area, Colorado

27—Rock outcrop-Biedsaw complex, 25 to 65 percent slopes, extremely bouldery

Map Unit Setting

Elevation: 5,800 to 8,000 feet

Mean annual precipitation: 10 to 13 inches

Mean annual air temperature: 46 to 52 degrees F

Frost-free period: 100 to 135 days

Map Unit Composition

Rock outcrop: 55 percent

Biedsaw and similar soils: 30 percent

Description of Rock Outcrop

Setting

Landform: Cliffs on canyons, cliffs on hills, free faces on canyons, free faces on hills, ledges on canyons, ledges on hills

Landform position (three-dimensional): Free face, side slope, base slope

Down-slope shape: Convex, linear

Across-slope shape: Linear, convex

Parent material: Residuum weathered from sandstone and shale

Properties and qualities

Slope: 25 to 65 percent

Depth to restrictive feature: 0 to 4 inches to lithic bedrock

Capacity of the most limiting layer to transmit water (Ksat): Very low to low (0.00 to 0.00 in/hr)

Available water capacity: Very low (about 0.0 inches)

Interpretive groups

Land capability (nonirrigated): 8s

Typical profile

0 to 60 inches: Unweathered bedrock

Description of Biedsaw

Setting

Landform: Mesas

Landform position (two-dimensional): Backslope

Landform position (three-dimensional): Flat

Down-slope shape: Convex

Across-slope shape: Linear

Parent material: Colluvium derived from sandstone and shale over residuum weathered from clayey shale

Properties and qualities

Slope: 25 to 65 percent

Surface area covered with cobbles, stones or boulders: 9.0 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

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Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 10 percent
Maximum salinity: Nonsaline to very slightly saline (2.0 to 4.0 mmhos/cm)
Available water capacity: Moderate (about 8.6 inches)

Interpretive groups

Land capability (nonirrigated): 7e

Typical profile

0 to 16 inches: Very cobbly clay loam
16 to 32 inches: Silty clay
32 to 60 inches: Silty clay

32—Iles loam, dry, 3 to 12 percent slopes

Map Unit Setting

Elevation: 7,500 to 8,000 feet
Mean annual precipitation: 16 to 18 inches
Mean annual air temperature: 43 to 45 degrees F
Frost-free period: 75 to 100 days

Map Unit Composition

Iles, dry, and similar soils: 90 percent

Description of Iles, Dry

Setting

Landform: Mesas
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Flat
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Colluvium and/or residuum weathered from sandstone and shale

Properties and qualities

Slope: 3 to 12 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Available water capacity: High (about 10.0 inches)

Interpretive groups

Land capability (nonirrigated): 4e
Ecological site: Loamy Foothills (R048AY284CO)

Other vegetative classification: LOAMY FOOTHILLS (048AY284CO)

Typical profile

0 to 3 inches: Loam
3 to 6 inches: Silty clay loam
6 to 14 inches: Clay
14 to 22 inches: Clay
22 to 60 inches: Clay loam

33—Fergus-Zoltay complex, 3 to 12 percent slopes

Map Unit Setting

Elevation: 7,400 to 8,200 feet
Mean annual precipitation: 16 to 18 inches
Mean annual air temperature: 43 to 45 degrees F
Frost-free period: 75 to 100 days

Map Unit Composition

Fergus and similar soils: 45 percent
Zoltay and similar soils: 40 percent

Description of Fergus

Setting

Landform: Terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from sandstone and shale and/or colluvium

Properties and qualities

Slope: 3 to 12 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Available water capacity: High (about 10.9 inches)

Interpretive groups

Land capability (nonirrigated): 4e
Ecological site: Foothill Swale (R048AY285CO)

Typical profile

0 to 8 inches: Clay loam
8 to 24 inches: Clay loam
24 to 60 inches: Clay loam

Description of Zoltay

Setting

Landform: Terraces

Landform position (two-dimensional): Footslope

Landform position (three-dimensional): Tread

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Alluvium and/or colluvium derived from sandstone and shale

Properties and qualities

Slope: 3 to 12 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum content: 10 percent

Available water capacity: Moderate (about 8.1 inches)

Interpretive groups

Land capability (nonirrigated): 4e

Ecological site: Shallow Slopes (R048AY307CO)

Typical profile

0 to 3 inches: Loam

3 to 18 inches: Silty clay loam

18 to 39 inches: Clay

39 to 60 inches: Gravelly clay

34—Wrayha-Dollard-Fergus complex, 25 to 65 percent slopes, very stony

Map Unit Setting

Elevation: 7,400 to 8,200 feet

Mean annual precipitation: 16 to 18 inches

Mean annual air temperature: 43 to 45 degrees F

Frost-free period: 75 to 100 days

Map Unit Composition

Wrayha and similar soils: 35 percent

Dollard and similar soils: 30 percent

Fergus and similar soils: 20 percent

Description of Wrayha

Setting

Landform: Mesas

Landform position (two-dimensional): Backslope

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Landform position (three-dimensional): Flat

Down-slope shape: Convex

Across-slope shape: Linear

Parent material: Colluvium derived from sandstone and shale and/or residuum weathered from clayey shale

Properties and qualities

Slope: 30 to 65 percent

Surface area covered with cobbles, stones or boulders: 1.5 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum content: 30 percent

Gypsum, maximum content: 1 percent

Maximum salinity: Nonsaline (0.0 to 2.0 mmhos/cm)

Sodium adsorption ratio, maximum: 5.0

Available water capacity: High (about 10.5 inches)

Interpretive groups

Land capability (nonirrigated): 7e

Typical profile

0 to 2 inches: Gravelly loam

2 to 7 inches: Gravelly clay loam

7 to 60 inches: Silty clay loam

Description of Dollard

Setting

Landform: Mesas

Landform position (two-dimensional): Backslope

Landform position (three-dimensional): Flat

Down-slope shape: Convex

Across-slope shape: Linear

Parent material: Colluvium derived from sandstone and shale and/or residuum weathered from clayey shale

Properties and qualities

Slope: 30 to 65 percent

Surface area covered with cobbles, stones or boulders: 1.5 percent

Depth to restrictive feature: 20 to 40 inches to paralithic bedrock

Drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum content: 45 percent

Gypsum, maximum content: 1 percent

Maximum salinity: Nonsaline (0.0 to 2.0 mmhos/cm)

Sodium adsorption ratio, maximum: 5.0

Available water capacity: Low (about 5.5 inches)

Interpretive groups

Land capability (nonirrigated): 7e

Typical profile

*0 to 3 inches: Gravelly silty clay loam
3 to 11 inches: Gravelly silty clay loam
11 to 35 inches: Clay
35 to 39 inches: Weathered bedrock*

Description of Fergus

Setting

*Landform: Mesas
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Flat
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Colluvium derived from sandstone and shale*

Properties and qualities

*Slope: 25 to 65 percent
Surface area covered with cobbles, stones or boulders: 1.5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Available water capacity: High (about 10.7 inches)*

Interpretive groups

Land capability (nonirrigated): 7e

Typical profile

*0 to 8 inches: Loam
8 to 24 inches: Clay loam
24 to 60 inches: Clay loam*

53—Bodot-Mellenthin-Rock outcrop complex, 6 to 65 percent slopes, extremely stony

Map Unit Setting

*Elevation: 5,500 to 8,100 feet
Mean annual precipitation: 10 to 13 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 90 to 135 days*

Map Unit Composition

Bodot and similar soils: 45 percent
Mellenthin and similar soils: 25 percent
Rock outcrop: 20 percent

Description of Bodot

Setting

Landform: Mesas
Landform position (two-dimensional): Backslope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Colluvium derived from sandstone and shale over residuum weathered from clayey shale

Properties and qualities

Slope: 6 to 55 percent
Surface area covered with cobbles, stones or boulders: 9.0 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 10 percent
Maximum salinity: Nonsaline (0.0 to 2.0 mmhos/cm)
Available water capacity: Low (about 4.5 inches)

Interpretive groups

Land capability (nonirrigated): 7e

Typical profile

0 to 5 inches: Very gravelly clay loam
5 to 32 inches: Clay
32 to 36 inches: Weathered bedrock

Description of Mellenthin

Setting

Landform: Benches
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Residuum weathered from calcareous sandstone

Properties and qualities

Slope: 6 to 65 percent
Surface area covered with cobbles, stones or boulders: 0.1 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent

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Maximum salinity: Nonsaline (0.0 to 2.0 mmhos/cm)
Available water capacity: Very low (about 1.5 inches)

Interpretive groups

Land capability (nonirrigated): 7e

Typical profile

0 to 4 inches: Fine sandy loam
4 to 13 inches: Very cobbly fine sandy loam
13 to 19 inches: Extremely cobbly fine sandy loam
19 to 23 inches: Unweathered bedrock

Description of Rock Outcrop

Setting

Landform: Cliffs on canyons, cliffs on hills, free faces on canyons, free faces on hills, ledges on canyons, ledges on hills
Landform position (three-dimensional): Free face, side slope, base slope
Down-slope shape: Linear, convex
Across-slope shape: Convex, linear
Parent material: Residuum weathered from sandstone and shale

Properties and qualities

Slope: 6 to 65 percent
Depth to restrictive feature: 0 to 4 inches to lithic bedrock
Capacity of the most limiting layer to transmit water (Ksat): Very low to low (0.00 to 0.00 in/hr)
Available water capacity: Very low (about 0.0 inches)

Interpretive groups

Land capability (nonirrigated): 8s

Typical profile

0 to 60 inches: Unweathered bedrock

64—Barx-Progresso complex, 3 to 12 percent slopes

Map Unit Setting

Elevation: 5,500 to 7,000 feet
Mean annual precipitation: 10 to 13 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 100 to 135 days

Map Unit Composition

Barx and similar soils: 45 percent
Progresso and similar soils: 40 percent

Description of Barx

Setting

Landform: Mesas

Custom Soil Resource Report

Landform position (two-dimensional): Summit
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Alluvium derived from sandstone and shale and/or colluvium derived from sandstone and shale

Properties and qualities

Slope: 3 to 12 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline to very slightly saline (2.0 to 4.0 mmhos/cm)
Available water capacity: High (about 10.8 inches)

Interpretive groups

Land capability (nonirrigated): 4e
Ecological site: Semidesert Sandy Loam (R034XY326CO)

Typical profile

0 to 5 inches: Fine sandy loam
5 to 27 inches: Clay loam
27 to 60 inches: Clay loam

Description of Progresso

Setting

Landform: Mesas
Landform position (two-dimensional): Summit
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Residuum weathered from sandstone

Properties and qualities

Slope: 3 to 12 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water capacity: Low (about 3.1 inches)

Interpretive groups

Land capability (nonirrigated): 4e
Ecological site: Semidesert Sandy Loam (R034XY326CO)

Typical profile

0 to 6 inches: Fine sandy loam
6 to 17 inches: Sandy clay loam
17 to 21 inches: Fine sandy loam
21 to 26 inches: Weathered bedrock

26 to 30 inches: Unweathered bedrock

65—Progresso-Rock outcrop-Bowdish complex, 3 to 12 percent slopes, stony

Map Unit Setting

Elevation: 5,200 to 7,000 feet

Mean annual precipitation: 10 to 13 inches

Mean annual air temperature: 46 to 50 degrees F

Frost-free period: 100 to 135 days

Map Unit Composition

Progresso and similar soils: 35 percent

Rock outcrop: 30 percent

Bowdish and similar soils: 25 percent

Description of Progresso

Setting

Landform: Mesas

Landform position (two-dimensional): Summit

Down-slope shape: Convex

Across-slope shape: Linear

Parent material: Residuum weathered from sandstone

Properties and qualities

Slope: 3 to 12 percent

Depth to restrictive feature: 20 to 40 inches to lithic bedrock

Drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum content: 25 percent

Available water capacity: Low (about 3.1 inches)

Interpretive groups

Land capability (nonirrigated): 4e

Typical profile

0 to 6 inches: Fine sandy loam

6 to 17 inches: Sandy clay loam

17 to 21 inches: Fine sandy loam

21 to 26 inches: Weathered bedrock

26 to 30 inches: Unweathered bedrock

Description of Rock Outcrop

Setting

Landform: Cliffs on canyons, cliffs on hills, free faces on canyons, free faces on hills, ledges on canyons, ledges on hills

Landform position (three-dimensional): Side slope, base slope, free face

Down-slope shape: Convex, linear

Across-slope shape: Linear, convex

Parent material: Residuum weathered from sandstone

Properties and qualities

Slope: 3 to 12 percent

Depth to restrictive feature: 0 to 4 inches to lithic bedrock

Capacity of the most limiting layer to transmit water (Ksat): Very low to low (0.00 to 0.00 in/hr)

Available water capacity: Very low (about 0.0 inches)

Interpretive groups

Land capability (nonirrigated): 8s

Typical profile

0 to 60 inches: Unweathered bedrock

Description of Bowdish

Setting

Landform: Mesas

Landform position (two-dimensional): Summit

Down-slope shape: Convex

Across-slope shape: Linear

Parent material: Residuum weathered from sandstone

Properties and qualities

Slope: 3 to 12 percent

Surface area covered with cobbles, stones or boulders: 0.1 percent

Depth to restrictive feature: 20 to 40 inches to lithic bedrock

Drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum content: 30 percent

Available water capacity: Low (about 3.1 inches)

Interpretive groups

Land capability (nonirrigated): 4e

Typical profile

0 to 2 inches: Sandy loam

2 to 26 inches: Gravelly sandy clay loam

26 to 30 inches: Unweathered bedrock

66—Bodot-Sili-Rock outcrop complex, 5 to 25 percent slopes, very bouldery

Map Unit Setting

Elevation: 5,500 to 8,100 feet

Mean annual precipitation: 10 to 13 inches

Mean annual air temperature: 46 to 50 degrees F

Frost-free period: 100 to 135 days

Map Unit Composition

Bodot and similar soils: 45 percent

Sili and similar soils: 25 percent

Rock outcrop: 20 percent

Description of Bodot

Setting

Landform: Benches

Landform position (two-dimensional): Footslope

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Colluvium derived from sandstone and shale over residuum weathered from clayey shale

Properties and qualities

Slope: 6 to 25 percent

Surface area covered with cobbles, stones or boulders: 1.5 percent

Depth to restrictive feature: 20 to 40 inches to paralithic bedrock

Drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum content: 10 percent

Maximum salinity: Nonsaline (0.0 to 2.0 mmhos/cm)

Available water capacity: Low (about 4.9 inches)

Interpretive groups

Land capability (nonirrigated): 6e

Typical profile

0 to 5 inches: Clay loam

5 to 32 inches: Clay

32 to 36 inches: Weathered bedrock

Description of Sili

Setting

Landform: Benches

Landform position (two-dimensional): Foothlope

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Colluvium derived from sandstone and shale over residuum weathered from clayey shale

Properties and qualities

Slope: 5 to 25 percent

Surface area covered with cobbles, stones or boulders: 1.5 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum content: 15 percent

Maximum salinity: Nonsaline (0.0 to 2.0 mmhos/cm)

Sodium adsorption ratio, maximum: 20.0

Available water capacity: High (about 9.3 inches)

Interpretive groups

Land capability (nonirrigated): 6e

Ecological site: Clayey Foothills (R034XY289CO)

Typical profile

0 to 3 inches: Clay loam

3 to 9 inches: Gravelly clay loam

9 to 15 inches: Clay loam

15 to 39 inches: Clay

39 to 60 inches: Clay

Description of Rock Outcrop

Setting

Landform: Cliffs on canyons, cliffs on hills, free faces on canyons, free faces on hills, ledges on canyons, ledges on hills

Landform position (three-dimensional): Side slope, base slope, free face

Down-slope shape: Linear, convex

Across-slope shape: Linear, convex

Parent material: Residuum weathered from sandstone and shale

Properties and qualities

Slope: 5 to 25 percent

Depth to restrictive feature: 0 to 4 inches to lithic bedrock

Capacity of the most limiting layer to transmit water (Ksat): Very low to low (0.00 to 0.00 in/hr)

Available water capacity: Very low (about 0.0 inches)

Interpretive groups

Land capability (nonirrigated): 8s

Typical profile

0 to 60 inches: Unweathered bedrock

67—Gladel-Bond-Rock outcrop complex, 3 to 25 percent slopes

Map Unit Setting

Elevation: 5,500 to 7,000 feet

Mean annual precipitation: 10 to 13 inches

Mean annual air temperature: 46 to 50 degrees F

Frost-free period: 100 to 160 days

Map Unit Composition

Gladel and similar soils: 40 percent

Bond and similar soils: 30 percent

Rock outcrop: 20 percent

Description of Gladel

Setting

Landform: Benches, mesas

Landform position (two-dimensional): Summit

Down-slope shape: Linear, convex

Across-slope shape: Linear

Parent material: Residuum weathered from sandstone

Properties and qualities

Slope: 3 to 12 percent

Depth to restrictive feature: 8 to 20 inches to lithic bedrock

Drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum content: 10 percent

Maximum salinity: Nonsaline (0.0 to 2.0 mmhos/cm)

Available water capacity: Very low (about 0.9 inches)

Interpretive groups

Land capability (nonirrigated): 7s

Typical profile

0 to 4 inches: Sandy loam

4 to 8 inches: Sandy loam

8 to 12 inches: Unweathered bedrock

Description of Bond

Setting

Landform: Benches, mesas

Custom Soil Resource Report

Landform position (two-dimensional): Summit

Down-slope shape: Linear, convex

Across-slope shape: Linear

Parent material: Colluvium derived from sandstone and/or residuum weathered from sandstone

Properties and qualities

Slope: 3 to 12 percent

Depth to restrictive feature: 10 to 20 inches to lithic bedrock

Drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum content: 10 percent

Available water capacity: Very low (about 2.2 inches)

Interpretive groups

Land capability (nonirrigated): 6s

Typical profile

0 to 7 inches: Fine sandy loam

7 to 14 inches: Sandy clay loam

14 to 18 inches: Unweathered bedrock

Description of Rock Outcrop

Setting

Landform: Cliffs on canyons, cliffs on hills, free faces on canyons, free faces on hills, ledges on canyons, ledges on hills

Landform position (three-dimensional): Side slope, base slope, free face

Down-slope shape: Convex, linear

Across-slope shape: Linear, convex

Parent material: Residuum weathered from sandstone and shale

Properties and qualities

Slope: 3 to 25 percent

Depth to restrictive feature: 0 to 4 inches to lithic bedrock

Capacity of the most limiting layer to transmit water (Ksat): Very low to low (0.00 to 0.00 in/hr)

Available water capacity: Very low (about 0.0 inches)

Interpretive groups

Land capability (nonirrigated): 8s

Typical profile

0 to 60 inches: Unweathered bedrock

904—Rock outcrop, 50 to 99 percent slopes

Map Unit Composition

Rock outcrop: 80 percent

Description of Rock Outcrop

Setting

Landform: Cliffs on canyons, cliffs on hills, free faces on canyons, free faces on hills, ledges on canyons, ledges on hills

Landform position (three-dimensional): Free face, side slope, base slope

Down-slope shape: Linear, convex

Across-slope shape: Convex, linear

Parent material: Residuum weathered from sandstone over residuum weathered from sandstone and shale

Properties and qualities

Slope: 50 to 99 percent

Depth to restrictive feature: 0 to 4 inches to lithic bedrock

Capacity of the most limiting layer to transmit water (Ksat): Very low to low (0.00 to 0.00 in/hr)

Available water capacity: Very low (about 0.0 inches)

Interpretive groups

Land capability (nonirrigated): 8s

Typical profile

0 to 60 inches: Unweathered bedrock

Uncompahgre National Forest Area, Colorado, Parts of Mesa, Montrose, Ouray, and San Miguel Counties

10—Arabrab-Dalhart families complex, 3 to 15 percent slopes

Map Unit Setting

Elevation: 6,400 to 7,700 feet

Mean annual precipitation: 12 to 16 inches

Mean annual air temperature: 52 to 54 degrees F

Frost-free period: 100 to 120 days

Map Unit Composition

Arabrab family and similar soils: 50 percent

Dalhart family and similar soils: 40 percent

Minor components: 5 percent

Description of Arabrab Family

Setting

Landform: Mesas, ridges, plateaus

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Residuum weathered from sandstone

Properties and qualities

Slope: 3 to 15 percent

Depth to restrictive feature: 10 to 20 inches to lithic bedrock

Drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum content: 5 percent

Maximum salinity: Nonsaline (0.0 to 2.0 mmhos/cm)

Available water capacity: Very low (about 2.3 inches)

Interpretive groups

Land capability (nonirrigated): 7e

Typical profile

0 to 6 inches: Sandy loam

6 to 14 inches: Sandy clay loam

14 to 19 inches: Gravelly sandy clay loam

19 to 19 inches: Unweathered bedrock

Description of Dalhart Family

Setting

Landform: Plateaus, plateaus

Down-slope shape: Linear

Across-slope shape: Linear

Properties and qualities

Slope: 3 to 15 percent

Depth to restrictive feature: 20 inches to lithic bedrock

Custom Soil Resource Report

Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 4.0 mmhos/cm)
Available water capacity: Very low (about 3.0 inches)

Interpretive groups

Land capability (nonirrigated): 6e

Typical profile

0 to 4 inches: Sandy loam
4 to 13 inches: Sandy clay loam
13 to 37 inches: Sandy clay loam
37 to 41 inches: Unweathered bedrock

Minor Components

Aquic ustifluvents

Percent of map unit: 5 percent
Landform: Flood plains

26—Mirand-Callan families-Chilson variant complex, 3 to 20 percent slopes

Map Unit Setting

Elevation: 7,000 to 7,600 feet
Mean annual precipitation: 14 to 19 inches
Mean annual air temperature: 43 to 52 degrees F
Frost-free period: 75 to 110 days

Map Unit Composition

Mirand family and similar soils: 45 percent
Callan family and similar soils: 25 percent
Chilson variant and similar soils: 15 percent

Description of Mirand Family

Setting

Landform: Plateaus
Landform position (two-dimensional): Backslope, summit
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Mixed loess over alluvium and/or materials derived from sandstone and shale

Custom Soil Resource Report

Properties and qualities

Slope: 3 to 10 percent
Depth to restrictive feature: 20 inches to lithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline (0.0 to 2.0 mmhos/cm)
Available water capacity: Very low (about 2.9 inches)

Interpretive groups

Land capability (nonirrigated): 6e

Typical profile

0 to 8 inches: Loam
8 to 37 inches: Clay loam
37 to 60 inches: Clay loam

Description of Callan Family

Setting

Landform: Plateaus
Landform position (two-dimensional): Backslope, summit
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Mixed loess over alluvium and/or materials derived from sandstone and shale

Properties and qualities

Slope: 3 to 10 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Maximum salinity: Nonsaline (0.0 to 2.0 mmhos/cm)
Available water capacity: High (about 9.7 inches)

Interpretive groups

Land capability (nonirrigated): 6e

Typical profile

0 to 7 inches: Silt loam
7 to 10 inches: Clay loam
10 to 45 inches: Clay
45 to 60 inches: Clay loam

Description of Chilson Variant

Setting

Landform: Plateaus

Custom Soil Resource Report

Landform position (two-dimensional): Backslope, summit

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Mixed loess over alluvium and/or materials derived from sandstone and shale

Properties and qualities

Slope: 8 to 20 percent

Depth to restrictive feature: 7 to 20 inches to lithic bedrock

Drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water capacity: Low (about 3.1 inches)

Interpretive groups

Land capability (nonirrigated): 6e

Typical profile

0 to 5 inches: Sandy loam

5 to 14 inches: Sandy clay loam, cobbly sandy clay loam

14 to 19 inches: Cobbly clay, clay

19 to 23 inches: Unweathered bedrock

32—Ustorthents-Ustochrepts-Rock outcrop complex, 40 to 150 percent slopes

Map Unit Setting

Elevation: 6,200 to 9,700 feet

Mean annual precipitation: 14 to 26 inches

Mean annual air temperature: 37 to 46 degrees F

Frost-free period: 60 to 100 days

Map Unit Composition

Ustorthents and similar soils: 40 percent

Ustochrepts and similar soils: 30 percent

Rock outcrop: 20 percent

Description of Ustorthents

Setting

Landform: Canyons, plateaus

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Sandy loam gravelly residuum over dakota sandstone

Properties and qualities

Slope: 40 to 70 percent

Custom Soil Resource Report

Depth to restrictive feature: 10 to 60 inches to lithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Low (about 3.7 inches)

Interpretive groups

Land capability classification (irrigated): 7e
Land capability (nonirrigated): 7e

Typical profile

0 to 4 inches: Cobbly loam
4 to 60 inches: Very cobbly sandy loam

Description of Ustorchrepts

Setting

Landform: Canyons, plateaus
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Residuum weathered from sandstone

Properties and qualities

Slope: 60 to 99 percent
Depth to restrictive feature: 10 to 60 inches to lithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.06 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Low (about 3.4 inches)

Interpretive groups

Land capability (nonirrigated): 7e

Typical profile

0 to 4 inches: Variable
4 to 40 inches: Very cobbly clay loam
40 to 44 inches: Weathered bedrock

Description of Rock Outcrop

Setting

Landform: Canyons, plateaus
Down-slope shape: Linear
Across-slope shape: Linear

Properties and qualities

Slope: 40 to 99 percent
Depth to restrictive feature: 0 inches to lithic bedrock
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Available water capacity: Very low (about 0.0 inches)

Interpretive groups

Land capability (nonirrigated): 8s

Custom Soil Resource Report

Typical profile

0 to 60 inches: Unweathered bedrock

Soil Information for All Uses

Soil Properties and Qualities

The Soil Properties and Qualities section includes various soil properties and qualities displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each property or quality.

Soil Erosion Factors

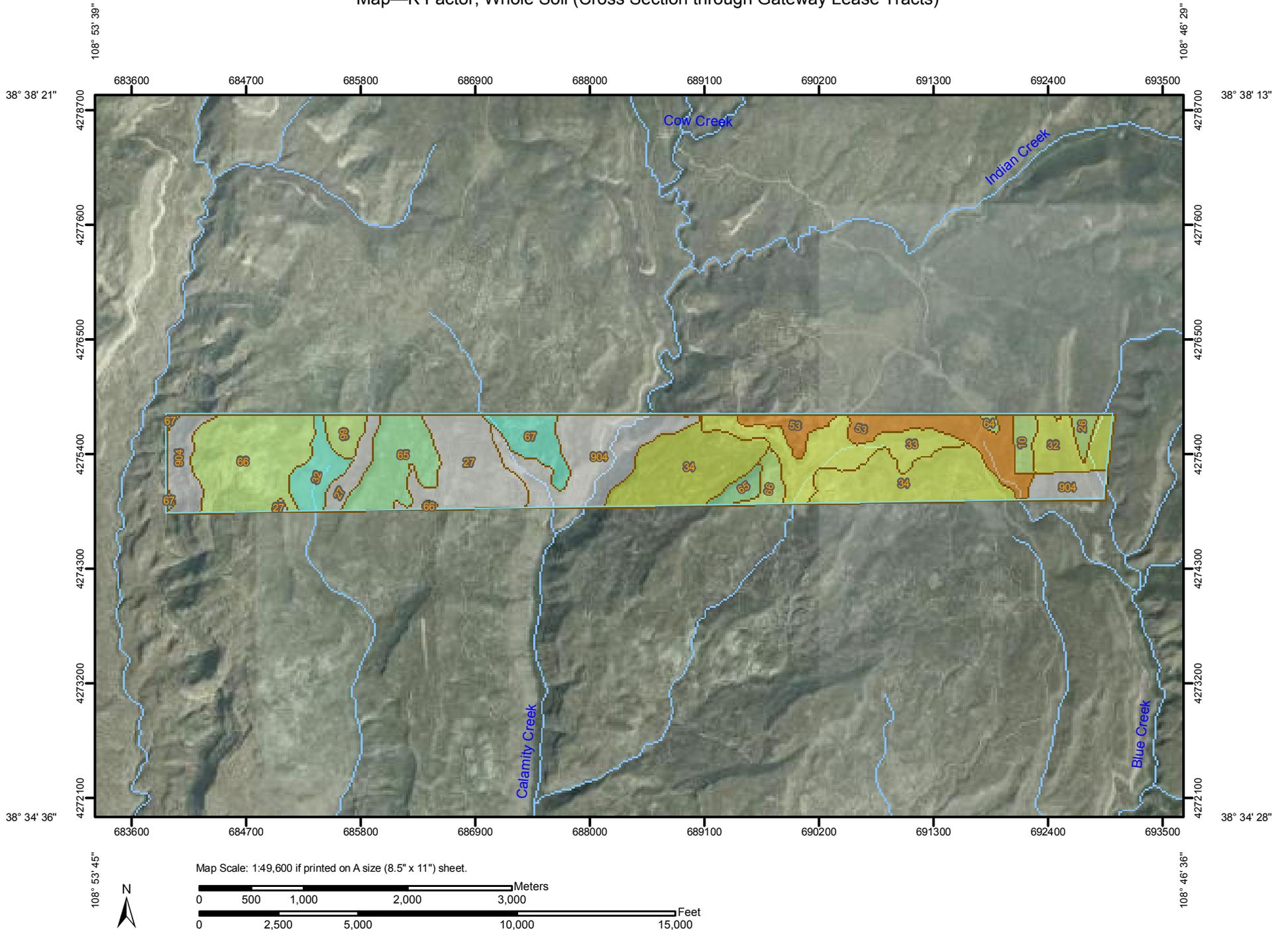
Soil Erosion Factors are soil properties and interpretations used in evaluating the soil for potential erosion. Example soil erosion factors can include K factor for the whole soil or on a rock free basis, T factor, wind erodibility group and wind erodibility index.

K Factor, Whole Soil (Cross Section through Gateway Lease Tracts)

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

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

Custom Soil Resource Report
Map—K Factor, Whole Soil (Cross Section through Gateway Lease Tracts)



Custom Soil Resource Report

MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Units

Soil Ratings

 .02

 .05

 .10

 .15

 .17

 .20

 .24

 .28

 .32

 .37

 .43

 .49

 .55

 .64

 Not rated or not available

Political Features

 Cities

Water Features

 Streams and Canals

Transportation

 Rails



Interstate Highways



US Routes



Major Roads

MAP INFORMATION

Map Scale: 1:49,600 if printed on A size (8.5" × 11") sheet.

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for accurate map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>
Coordinate System: UTM Zone 12N NAD83

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Mesa County Area, Colorado
Survey Area Data: Version 3, Sep 25, 2007

Soil Survey Area: Uncompahgre National Forest Area, Colorado,
Parts of Mesa, Montrose, Ouray, and San Miguel Counties
Survey Area Data: Version 6, Mar 25, 2008

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

Date(s) aerial images were photographed: 8/28/2005

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—K Factor, Whole Soil (Cross Section through Gateway Lease Tracts)

K Factor, Whole Soil— Summary by Map Unit — Mesa County Area, Colorado (CO680)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
27	Rock outcrop-Biedsaw complex, 25 to 65 percent slopes, extremely bouldery		218.8	11.1%
32	Iles loam, dry, 3 to 12 percent slopes	.32	65.3	3.3%
33	Fergus-Zoltay complex, 3 to 12 percent slopes	.20	172.2	8.7%
34	Wrayha-Dollard-Fergus complex, 25 to 65 percent slopes, very stony	.20	381.6	19.3%
53	Bodot-Mellenthin-Rock outcrop complex, 6 to 65 percent slopes, extremely stony	.10	152.6	7.7%
64	Barx-Progresso complex, 3 to 12 percent slopes	.24	5.6	0.3%
65	Progresso-Rock outcrop-Bowdish complex, 3 to 12 percent slopes, stony	.28	154.9	7.8%
66	Bodot-Sili-Rock outcrop complex, 5 to 25 percent slopes, very bouldery	.24	293.1	14.8%
67	Gladel-Bond-Rock outcrop complex, 3 to 25 percent slopes	.32	74.7	3.8%
904	Rock outcrop, 50 to 99 percent slopes		332.2	16.8%
Subtotals for Soil Survey Area			1,850.9	93.5%
Totals for Area of Interest			1,979.8	100.0%

K Factor, Whole Soil— Summary by Map Unit — Uncompahgre National Forest Area, Colorado, Parts of Mesa, Montrose, Ouray, and San Miguel Counties (CO676)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
10	Arabrab-Dalhart families complex, 3 to 15 percent slopes	.24	29.4	1.5%
26	Mirand-Callan families-Chilson variant complex, 3 to 20 percent slopes	.24	17.2	0.9%
32	Ustorthents-Ustochrepts-Rock outcrop complex, 40 to 150 percent slopes	.20	82.3	4.2%
Subtotals for Soil Survey Area			128.9	6.5%
Totals for Area of Interest			1,979.8	100.0%

Rating Options—K Factor, Whole Soil (Cross Section through Gateway Lease Tracts)

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Custom Soil Resource Report

Tie-break Rule: Higher

Layer Options: Depth Range

Top Depth: 0

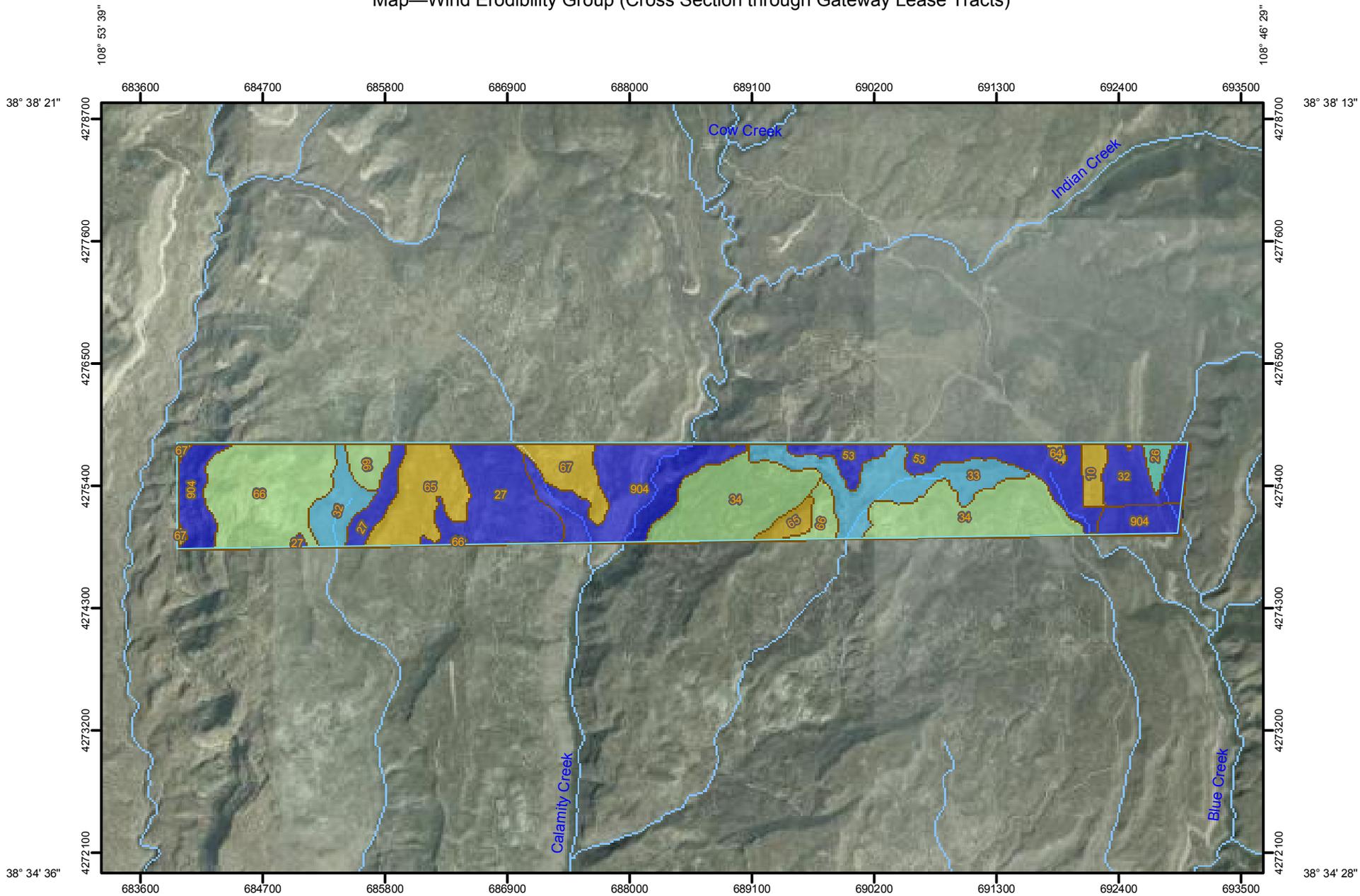
Bottom Depth: 12

Units of Measure: Centimeters

Wind Erodibility Group (Cross Section through Gateway Lease Tracts)

A wind erodibility group (WEG) consists of soils that have similar properties affecting their susceptibility to wind erosion in cultivated areas. The soils assigned to group 1 are the most susceptible to wind erosion, and those assigned to group 8 are the least susceptible.

Custom Soil Resource Report
Map—Wind Erodibility Group (Cross Section through Gateway Lease Tracts)



108° 53' 45"



Map Scale: 1:49,600 if printed on A size (8.5" x 11") sheet.



108° 46' 36"

Custom Soil Resource Report

MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Units

Soil Ratings

-  1
-  2
-  3
-  4
-  4L
-  5
-  6
-  7
-  8
-  Not rated or not available

Political Features

 Cities

Water Features

 Streams and Canals

Transportation

 Rails

 Interstate Highways

 US Routes

 Major Roads

MAP INFORMATION

Map Scale: 1:49,600 if printed on A size (8.5" x 11") sheet.

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for accurate map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>
Coordinate System: UTM Zone 12N NAD83

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Mesa County Area, Colorado
Survey Area Data: Version 3, Sep 25, 2007

Soil Survey Area: Uncompahgre National Forest Area, Colorado,
Parts of Mesa, Montrose, Ouray, and San Miguel Counties
Survey Area Data: Version 6, Mar 25, 2008

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

Date(s) aerial images were photographed: 8/28/2005

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—Wind Erodibility Group (Cross Section through Gateway Lease Tracts)

Wind Erodibility Group— Summary by Map Unit — Mesa County Area, Colorado (CO680)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
27	Rock outcrop-Biedsaw complex, 25 to 65 percent slopes, extremely bouldery	8	218.8	11.1%
32	Iles loam, dry, 3 to 12 percent slopes	6	65.3	3.3%
33	Fergus-Zoltay complex, 3 to 12 percent slopes	6	172.2	8.7%
34	Wrayha-Dollard-Fergus complex, 25 to 65 percent slopes, very stony	4L	381.6	19.3%
53	Bodot-Mellenthin-Rock outcrop complex, 6 to 65 percent slopes, extremely stony	8	152.6	7.7%
64	Barx-Progresso complex, 3 to 12 percent slopes	3	5.6	0.3%
65	Progresso-Rock outcrop-Bowdish complex, 3 to 12 percent slopes, stony	3	154.9	7.8%
66	Bodot-Sili-Rock outcrop complex, 5 to 25 percent slopes, very bouldery	4L	293.1	14.8%
67	Gladel-Bond-Rock outcrop complex, 3 to 25 percent slopes	3	74.7	3.8%
904	Rock outcrop, 50 to 99 percent slopes	8	332.2	16.8%
Subtotals for Soil Survey Area			1,850.9	93.5%
Totals for Area of Interest			1,979.8	100.0%

Wind Erodibility Group— Summary by Map Unit — Uncompahgre National Forest Area, Colorado, Parts of Mesa, Montrose, Ouray, and San Miguel Counties (CO676)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
10	Arabrab-Dalhart families complex, 3 to 15 percent slopes	3	29.4	1.5%
26	Mirand-Callan families-Chilson variant complex, 3 to 20 percent slopes	5	17.2	0.9%
32	Ustorthents-Ustochrepts-Rock outcrop complex, 40 to 150 percent slopes	8	82.3	4.2%
Subtotals for Soil Survey Area			128.9	6.5%
Totals for Area of Interest			1,979.8	100.0%

Rating Options—Wind Erodibility Group (Cross Section through Gateway Lease Tracts)

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

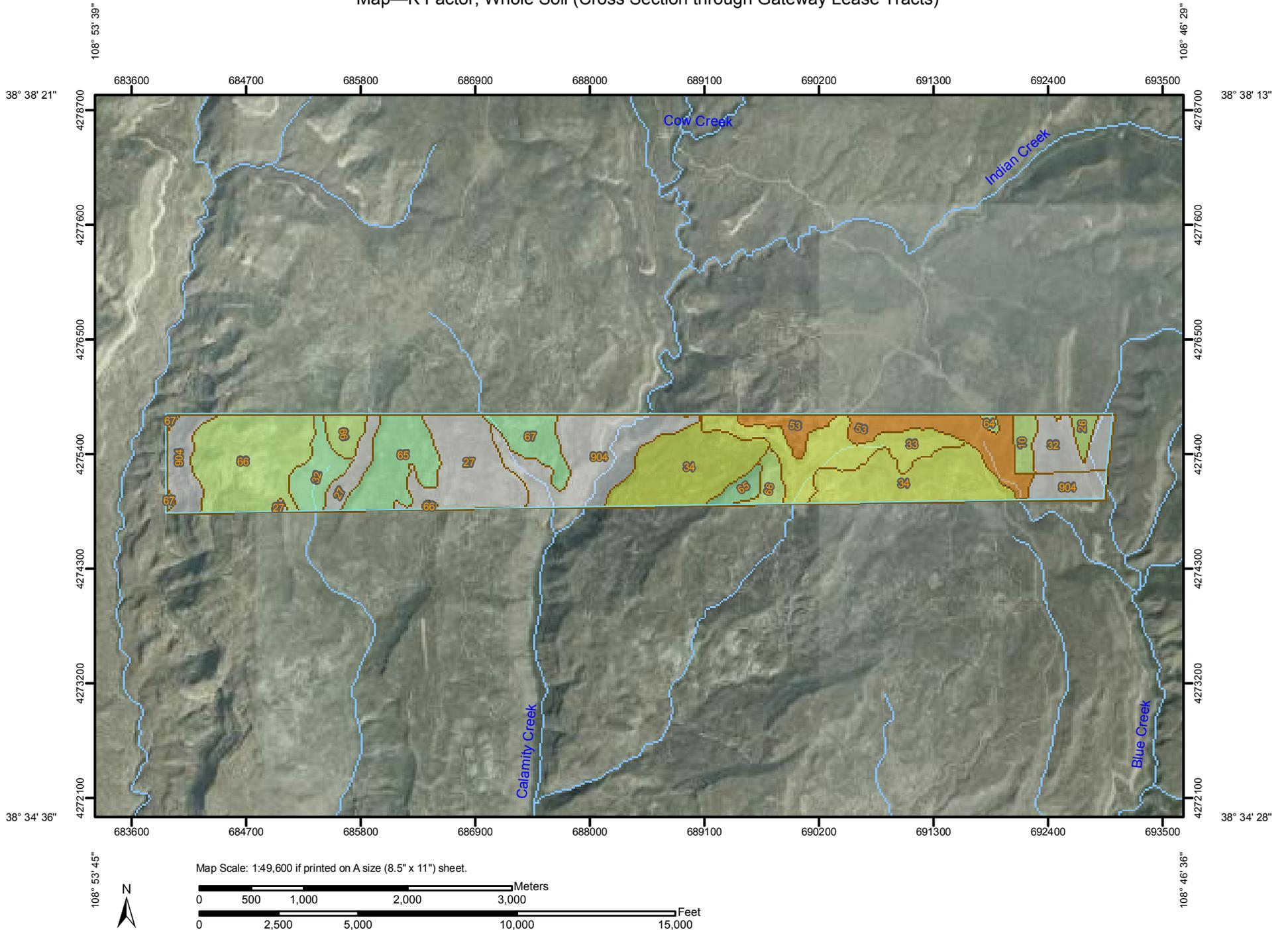
Tie-break Rule: Lower

K Factor, Whole Soil (Cross Section through Gateway Lease Tracts)

Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) and the Revised Universal Soil Loss Equation (RUSLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter and on soil structure and saturated hydraulic conductivity (K_{sat}). Values of K range from 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water.

"Erosion factor K_w (whole soil)" indicates the erodibility of the whole soil. The estimates are modified by the presence of rock fragments.

Custom Soil Resource Report
Map—K Factor, Whole Soil (Cross Section through Gateway Lease Tracts)



Custom Soil Resource Report

MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Units

Soil Ratings

 .02

 .05

 .10

 .15

 .17

 .20

 .24

 .28

 .32

 .37

 .43

 .49

 .55

 .64

 Not rated or not available

Political Features

 Cities

Water Features

 Streams and Canals

Transportation

 Rails



Interstate Highways



US Routes



Major Roads

MAP INFORMATION

Map Scale: 1:49,600 if printed on A size (8.5" x 11") sheet.

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

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Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>
Coordinate System: UTM Zone 12N NAD83

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Mesa County Area, Colorado
Survey Area Data: Version 3, Sep 25, 2007

Soil Survey Area: Uncompahgre National Forest Area, Colorado,
Parts of Mesa, Montrose, Ouray, and San Miguel Counties
Survey Area Data: Version 6, Mar 25, 2008

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

Date(s) aerial images were photographed: 8/28/2005

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—K Factor, Whole Soil (Cross Section through Gateway Lease Tracts)

K Factor, Whole Soil— Summary by Map Unit — Mesa County Area, Colorado (CO680)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
27	Rock outcrop-Biedsaw complex, 25 to 65 percent slopes, extremely bouldery		218.8	11.1%
32	Iles loam, dry, 3 to 12 percent slopes	.28	65.3	3.3%
33	Fergus-Zoltay complex, 3 to 12 percent slopes	.20	172.2	8.7%
34	Wrayha-Dollard-Fergus complex, 25 to 65 percent slopes, very stony	.20	381.6	19.3%
53	Bodot-Mellenthin-Rock outcrop complex, 6 to 65 percent slopes, extremely stony	.10	152.6	7.7%
64	Barx-Progresso complex, 3 to 12 percent slopes	.24	5.6	0.3%
65	Progresso-Rock outcrop-Bowdish complex, 3 to 12 percent slopes, stony	.28	154.9	7.8%
66	Bodot-Sili-Rock outcrop complex, 5 to 25 percent slopes, very bouldery	.24	293.1	14.8%
67	Gladel-Bond-Rock outcrop complex, 3 to 25 percent slopes	.28	74.7	3.8%
904	Rock outcrop, 50 to 99 percent slopes		332.2	16.8%
Subtotals for Soil Survey Area			1,850.9	93.5%
Totals for Area of Interest			1,979.8	100.0%

K Factor, Whole Soil— Summary by Map Unit — Uncompahgre National Forest Area, Colorado, Parts of Mesa, Montrose, Ouray, and San Miguel Counties (CO676)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
10	Arabrab-Dalhart families complex, 3 to 15 percent slopes	.24	29.4	1.5%
26	Mirand-Callan families-Chilson variant complex, 3 to 20 percent slopes	.24	17.2	0.9%
32	Ustorthents-Ustochrepts-Rock outcrop complex, 40 to 150 percent slopes		82.3	4.2%
Subtotals for Soil Survey Area			128.9	6.5%
Totals for Area of Interest			1,979.8	100.0%

Rating Options—K Factor, Whole Soil (Cross Section through Gateway Lease Tracts)

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Layer Options: Surface Layer

Soil Physical Properties

Soil Physical Properties are measured or inferred from direct observations in the field or laboratory. Examples of soil physical properties include percent clay, organic matter, saturated hydraulic conductivity, available water capacity, and bulk density.

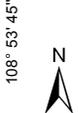
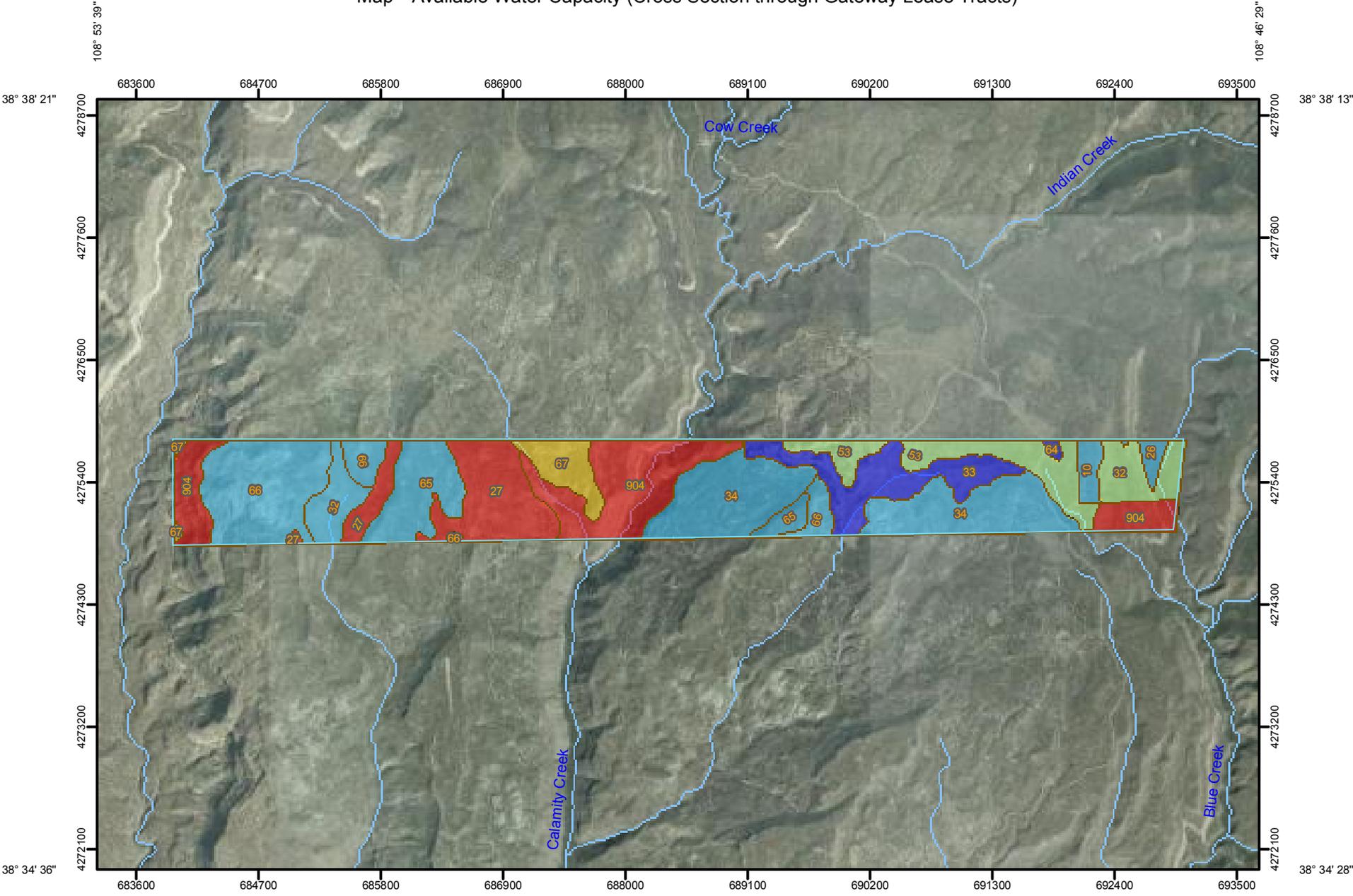
Available Water Capacity (Cross Section through Gateway Lease Tracts)

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

Available water supply (AWS) is computed as AWC times the thickness of the soil. For example, if AWC is 0.15 cm/cm, the available water supply for 25 centimeters of soil would be 0.15×25 , or 3.75 centimeters of water.

For each soil layer, AWC is recorded as three separate values in the database. A low value and a high value indicate the range of this attribute for the soil component. A "representative" value indicates the expected value of this attribute for the component. For this soil property, only the representative value is used.

Custom Soil Resource Report
Map—Available Water Capacity (Cross Section through Gateway Lease Tracts)



Map Scale: 1:49,600 if printed on A size (8.5" x 11") sheet.



Custom Soil Resource Report

MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Units

Soil Ratings

 ≤ 0

 > 0 AND ≤ 0.11

 > 0.11 AND ≤ 0.13

 > 0.13 AND ≤ 0.16

 > 0.16 AND ≤ 0.18

 Not rated or not available

Political Features

 Cities

Water Features

 Streams and Canals

Transportation

 Rails

 Interstate Highways

 US Routes

 Major Roads

MAP INFORMATION

Map Scale: 1:49,600 if printed on A size (8.5" x 11") sheet.

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

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Please rely on the bar scale on each map sheet for accurate map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>
Coordinate System: UTM Zone 12N NAD83

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Mesa County Area, Colorado
Survey Area Data: Version 3, Sep 25, 2007

Soil Survey Area: Uncompahgre National Forest Area, Colorado,
Parts of Mesa, Montrose, Ouray, and San Miguel Counties
Survey Area Data: Version 6, Mar 25, 2008

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Date(s) aerial images were photographed: 8/28/2005

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Table—Available Water Capacity (Cross Section through Gateway Lease Tracts)

Available Water Capacity— Summary by Map Unit — Mesa County Area, Colorado (CO680)				
Map unit symbol	Map unit name	Rating (centimeters per centimeter)	Acres in AOI	Percent of AOI
27	Rock outcrop-Biedsaw complex, 25 to 65 percent slopes, extremely bouldery	0.00	218.8	11.1%
32	Iles loam, dry, 3 to 12 percent slopes	0.15	65.3	3.3%
33	Fergus-Zoltay complex, 3 to 12 percent slopes	0.18	172.2	8.7%
34	Wrayha-Dollard-Fergus complex, 25 to 65 percent slopes, very stony	0.16	381.6	19.3%
53	Bodot-Mellenthin-Rock outcrop complex, 6 to 65 percent slopes, extremely stony	0.13	152.6	7.7%
64	Barx-Progresso complex, 3 to 12 percent slopes	0.17	5.6	0.3%
65	Progresso-Rock outcrop-Bowdish complex, 3 to 12 percent slopes, stony	0.15	154.9	7.8%
66	Bodot-Sili-Rock outcrop complex, 5 to 25 percent slopes, very bouldery	0.16	293.1	14.8%
67	Gladel-Bond-Rock outcrop complex, 3 to 25 percent slopes	0.11	74.7	3.8%
904	Rock outcrop, 50 to 99 percent slopes	0.00	332.2	16.8%
Subtotals for Soil Survey Area			1,850.9	93.5%
Totals for Area of Interest			1,979.8	100.0%

Available Water Capacity— Summary by Map Unit — Uncompahgre National Forest Area, Colorado, Parts of Mesa, Montrose, Ouray, and San Miguel Counties (CO676)				
Map unit symbol	Map unit name	Rating (centimeters per centimeter)	Acres in AOI	Percent of AOI
10	Arabrab-Dalhart families complex, 3 to 15 percent slopes	0.15	29.4	1.5%
26	Mirand-Callan families-Chilson variant complex, 3 to 20 percent slopes	0.16	17.2	0.9%
32	Ustorthents-Ustochrepts-Rock outcrop complex, 40 to 150 percent slopes	0.12	82.3	4.2%
Subtotals for Soil Survey Area			128.9	6.5%
Totals for Area of Interest			1,979.8	100.0%

Rating Options—Available Water Capacity (Cross Section through Gateway Lease Tracts)

Units of Measure: centimeters per centimeter

Aggregation Method: Dominant Component

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Interpret Nulls as Zero: No

Layer Options: Depth Range

Top Depth: 0

Bottom Depth: 12

Units of Measure: Inches

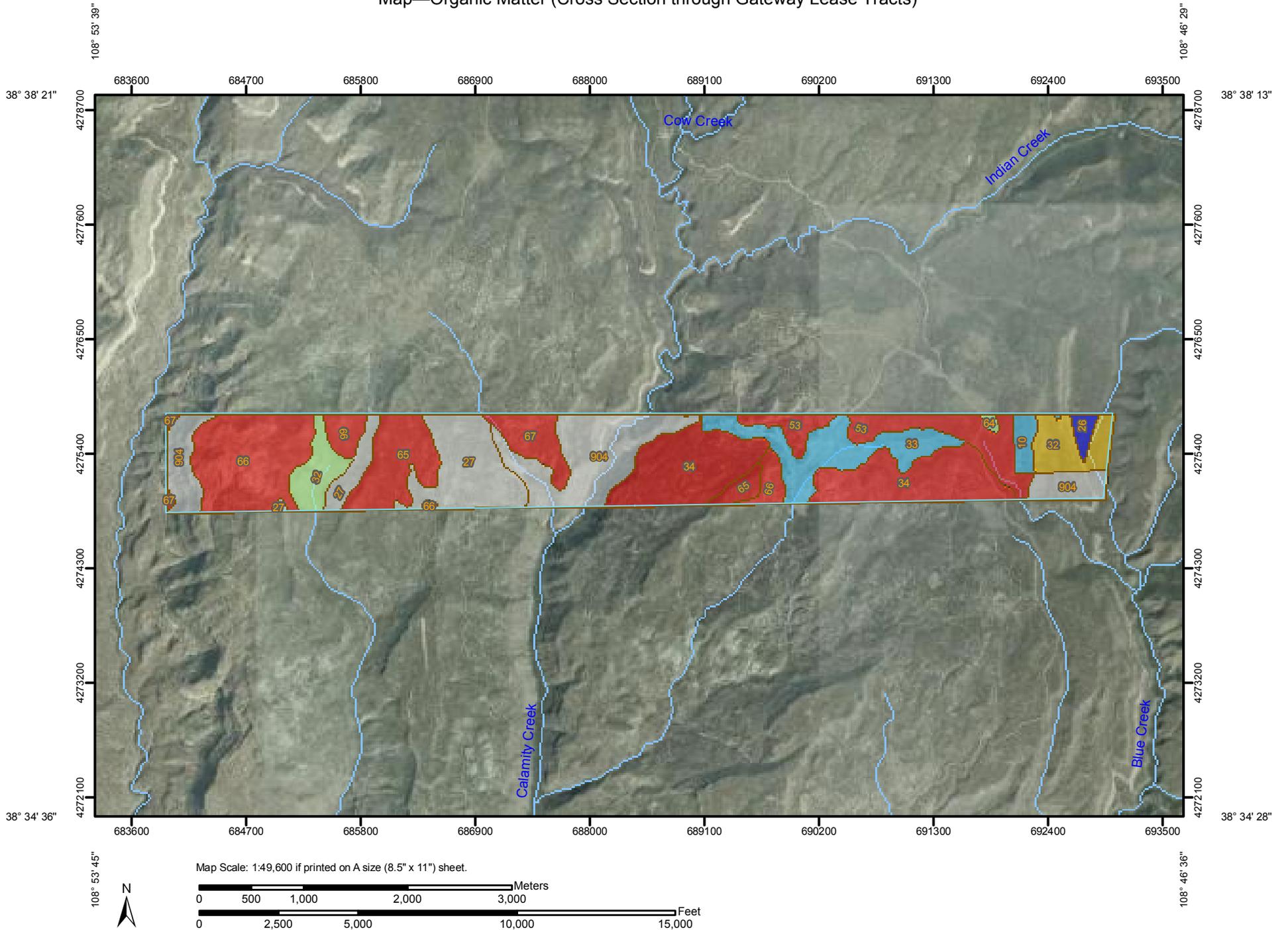
Organic Matter (Cross Section through Gateway Lease Tracts)

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

The content of organic matter in a soil can be maintained by returning crop residue to the soil. Organic matter has a positive effect on available water capacity, water infiltration, soil organism activity, and tilth. It is a source of nitrogen and other nutrients for crops and soil organisms. An irregular distribution of organic carbon with depth may indicate different episodes of soil deposition or soil formation. Soils that are very high in organic matter have poor engineering properties and subside upon drying.

For each soil layer, this attribute is actually recorded as three separate values in the database. A low value and a high value indicate the range of this attribute for the soil component. A "representative" value indicates the expected value of this attribute for the component. For this soil property, only the representative value is used.

Custom Soil Resource Report
Map—Organic Matter (Cross Section through Gateway Lease Tracts)



Custom Soil Resource Report

MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Units

Soil Ratings

 ≤ 0.55

 > 0.55 AND ≤ 0.75

 > 0.75 AND ≤ 1.08

 > 1.08 AND ≤ 1.58

 > 1.58 AND ≤ 2.5

 Not rated or not available

Political Features

 Cities

Water Features

 Streams and Canals

Transportation

 Rails

 Interstate Highways

 US Routes

 Major Roads

MAP INFORMATION

Map Scale: 1:49,600 if printed on A size (8.5" x 11") sheet.

The soil surveys that comprise your AOI were mapped at 1:24,000.

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Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>
Coordinate System: UTM Zone 12N NAD83

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Mesa County Area, Colorado
Survey Area Data: Version 3, Sep 25, 2007

Soil Survey Area: Uncompahgre National Forest Area, Colorado,
Parts of Mesa, Montrose, Ouray, and San Miguel Counties
Survey Area Data: Version 6, Mar 25, 2008

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Date(s) aerial images were photographed: 8/28/2005

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Custom Soil Resource Report

Table—Organic Matter (Cross Section through Gateway Lease Tracts)

Organic Matter— Summary by Map Unit — Mesa County Area, Colorado (CO680)				
Map unit symbol	Map unit name	Rating (percent)	Acres in AOI	Percent of AOI
27	Rock outcrop-Biedsaw complex, 25 to 65 percent slopes, extremely bouldery		218.8	11.1%
32	lles loam, dry, 3 to 12 percent slopes	0.95	65.3	3.3%
33	Fergus-Zoltay complex, 3 to 12 percent slopes	1.58	172.2	8.7%
34	Wrayha-Dollard-Fergus complex, 25 to 65 percent slopes, very stony	0.55	381.6	19.3%
53	Bodot-Mellenthin-Rock outcrop complex, 6 to 65 percent slopes, extremely stony	0.47	152.6	7.7%
64	Barx-Progresso complex, 3 to 12 percent slopes	1.08	5.6	0.3%
65	Progresso-Rock outcrop-Bowdish complex, 3 to 12 percent slopes, stony	0.50	154.9	7.8%
66	Bodot-Sili-Rock outcrop complex, 5 to 25 percent slopes, very bouldery	0.47	293.1	14.8%
67	Gladel-Bond-Rock outcrop complex, 3 to 25 percent slopes	0.38	74.7	3.8%
904	Rock outcrop, 50 to 99 percent slopes		332.2	16.8%
Subtotals for Soil Survey Area			1,850.9	93.5%
Totals for Area of Interest			1,979.8	100.0%

Organic Matter— Summary by Map Unit — Uncompahgre National Forest Area, Colorado, Parts of Mesa, Montrose, Ouray, and San Miguel Counties (CO676)				
Map unit symbol	Map unit name	Rating (percent)	Acres in AOI	Percent of AOI
10	Arabrab-Dalhart families complex, 3 to 15 percent slopes	1.38	29.4	1.5%
26	Mirand-Callan families-Chilson variant complex, 3 to 20 percent slopes	2.50	17.2	0.9%
32	Ustorhents-Ustochrepts-Rock outcrop complex, 40 to 150 percent slopes	0.75	82.3	4.2%
Subtotals for Soil Survey Area			128.9	6.5%
Totals for Area of Interest			1,979.8	100.0%

Rating Options—Organic Matter (Cross Section through Gateway Lease Tracts)

Units of Measure: percent

Aggregation Method: Dominant Component

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Interpret Nulls as Zero: No

Layer Options: Depth Range

Top Depth: 0

Bottom Depth: 12

Units of Measure: Inches

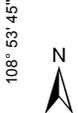
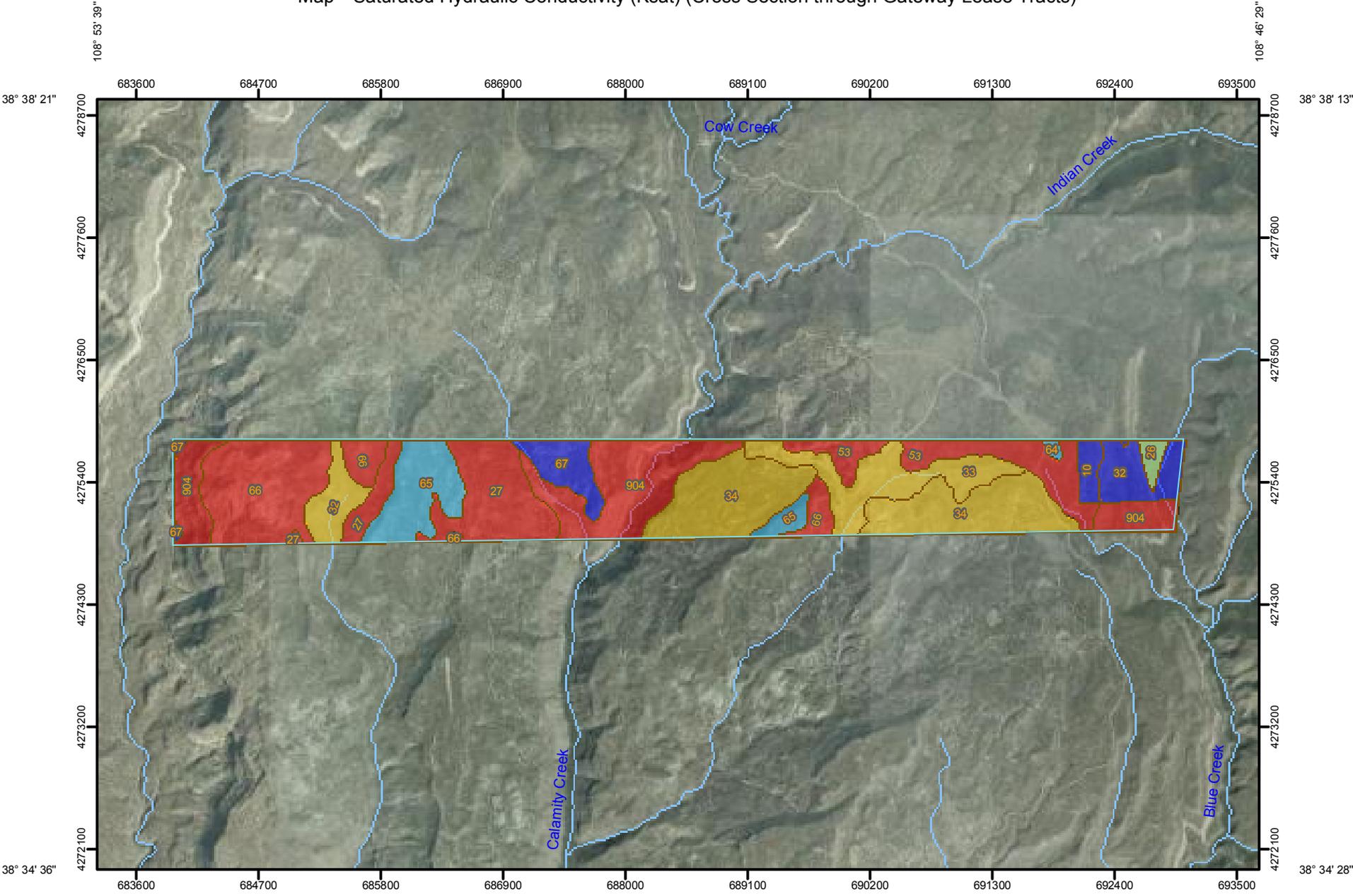
Saturated Hydraulic Conductivity (Ksat) (Cross Section through Gateway Lease Tracts)

Saturated hydraulic conductivity (Ksat) refers to the ease with which pores in a saturated soil transmit water. The estimates are expressed in terms of micrometers per second. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Saturated hydraulic conductivity is considered in the design of soil drainage systems and septic tank absorption fields.

For each soil layer, this attribute is actually recorded as three separate values in the database. A low value and a high value indicate the range of this attribute for the soil component. A "representative" value indicates the expected value of this attribute for the component. For this soil property, only the representative value is used.

The numeric Ksat values have been grouped according to standard Ksat class limits.

Custom Soil Resource Report
Map—Saturated Hydraulic Conductivity (Ksat) (Cross Section through Gateway Lease Tracts)



Map Scale: 1:49,600 if printed on A size (8.5" x 11") sheet.



Custom Soil Resource Report

MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Units

Soil Ratings

-  ≤ 1.5267
-  > 1.5267 AND ≤ 3.5633
-  > 3.5633 AND ≤ 6.42
-  > 6.42 AND ≤ 15.52
-  > 15.52 AND ≤ 28.22
-  Not rated or not available

Political Features

 Cities

Water Features

 Streams and Canals

Transportation

-  Rails
-  Interstate Highways
-  US Routes
-  Major Roads

MAP INFORMATION

Map Scale: 1:49,600 if printed on A size (8.5" x 11") sheet.

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Coordinate System: UTM Zone 12N NAD83

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Soil Survey Area: Uncompahgre National Forest Area, Colorado,
Parts of Mesa, Montrose, Ouray, and San Miguel Counties
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Table—Saturated Hydraulic Conductivity (Ksat) (Cross Section through Gateway Lease Tracts)

Saturated Hydraulic Conductivity (Ksat)— Summary by Map Unit — Mesa County Area, Colorado (CO680)				
Map unit symbol	Map unit name	Rating (micrometers per second)	Acres in AOI	Percent of AOI
27	Rock outcrop-Biedsaw complex, 25 to 65 percent slopes, extremely bouldery	0.0140	218.8	11.1%
32	Iles loam, dry, 3 to 12 percent slopes	3.5633	65.3	3.3%
33	Fergus-Zoltay complex, 3 to 12 percent slopes	2.1867	172.2	8.7%
34	Wrayha-Dollard-Fergus complex, 25 to 65 percent slopes, very stony	3.1183	381.6	19.3%
53	Bodot-Mellenthin-Rock outcrop complex, 6 to 65 percent slopes, extremely stony	1.5267	152.6	7.7%
64	Barx-Progresso complex, 3 to 12 percent slopes	11.6860	5.6	0.3%
65	Progresso-Rock outcrop-Bowdish complex, 3 to 12 percent slopes, stony	15.5200	154.9	7.8%
66	Bodot-Sili-Rock outcrop complex, 5 to 25 percent slopes, very bouldery	1.5267	293.1	14.8%
67	Gladel-Bond-Rock outcrop complex, 3 to 25 percent slopes	19.1200	74.7	3.8%
904	Rock outcrop, 50 to 99 percent slopes	0.0140	332.2	16.8%
Subtotals for Soil Survey Area			1,850.9	93.5%
Totals for Area of Interest			1,979.8	100.0%

Saturated Hydraulic Conductivity (Ksat)— Summary by Map Unit — Uncompahgre National Forest Area, Colorado, Parts of Mesa, Montrose, Ouray, and San Miguel Counties (CO676)				
Map unit symbol	Map unit name	Rating (micrometers per second)	Acres in AOI	Percent of AOI
10	Arabrab-Dalhart families complex, 3 to 15 percent slopes	18.6950	29.4	1.5%
26	Mirand-Callan families-Chilson variant complex, 3 to 20 percent slopes	6.4200	17.2	0.9%
32	Ustorthents-Ustochrepts-Rock outcrop complex, 40 to 150 percent slopes	28.2200	82.3	4.2%
Subtotals for Soil Survey Area			128.9	6.5%
Totals for Area of Interest			1,979.8	100.0%

Rating Options—Saturated Hydraulic Conductivity (Ksat) (Cross Section through Gateway Lease Tracts)

Units of Measure: micrometers per second

Aggregation Method: Dominant Component

Component Percent Cutoff: None Specified

Tie-break Rule: Fastest

Interpret Nulls as Zero: No

Layer Options: Depth Range

Top Depth: 0

Bottom Depth: 12

Units of Measure: Inches

Soil Qualities and Features

Soil qualities are behavior and performance attributes that are not directly measured, but are inferred from observations of dynamic conditions and from soil properties. Example soil qualities include natural drainage, and frost action. Soil features are attributes that are not directly part of the soil. Example soil features include slope and depth to restrictive layer. These features can greatly impact the use and management of the soil.

Parent Material Name (Cross Section through Gateway Lease Tracts)

Parent material name is a term for the general physical, chemical, and mineralogical composition of the unconsolidated material, mineral or organic, in which the soil forms. Mode of deposition and/or weathering may be implied by the name.

The soil surveyor uses parent material to develop a model used for soil mapping. Soil scientists and specialists in other disciplines use parent material to help interpret soil boundaries and project performance of the material below the soil. Many soil properties relate to parent material. Among these properties are proportions of sand, silt, and clay; chemical content; bulk density; structure; and the kinds and amounts of rock fragments. These properties affect interpretations and may be criteria used to separate soil series. Soil properties and landscape information may imply the kind of parent material.

For each soil in the database, one or more parent materials may be identified. One is marked as the representative or most commonly occurring. The representative parent material name is presented here.

Custom Soil Resource Report

MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Units

Soil Ratings

 alluvium derived from sandstone and shale and/or colluvium

 alluvium derived from sandstone and shale and/or colluvium derived from sandstone and shale

 colluvium and/or residuum weathered from sandstone and shale

 colluvium derived from sandstone and shale and/or residuum weathered from clayey shale

 colluvium derived from sandstone and shale over residuum weathered from clayey shale

 mixed loess over alluvium and/or materials derived from sandstone and shale

 residuum weathered from sandstone

 residuum weathered from sandstone and shale

 residuum weathered from sandstone over residuum weathered from sandstone and shale

 sandy loam gravelly residuum over dakota sandstone

 Not rated or not available

Political Features

 Cities

Water Features

 Streams and Canals

Transportation

 Rails

 Interstate Highways

 US Routes

 Major Roads

MAP INFORMATION

Map Scale: 1:49,600 if printed on A size (8.5" × 11") sheet.

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for accurate map measurements.

Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>
 Coordinate System: UTM Zone 12N NAD83

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Mesa County Area, Colorado
 Survey Area Data: Version 3, Sep 25, 2007

Soil Survey Area: Uncompahgre National Forest Area, Colorado,
 Parts of Mesa, Montrose, Ouray, and San Miguel Counties
 Survey Area Data: Version 6, Mar 25, 2008

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

Date(s) aerial images were photographed: 8/28/2005

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—Parent Material Name (Cross Section through Gateway Lease Tracts)

Parent Material Name— Summary by Map Unit — Mesa County Area, Colorado (CO680)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
27	Rock outcrop-Biedsaw complex, 25 to 65 percent slopes, extremely bouldery	residuum weathered from sandstone and shale	218.8	11.1%
32	lles loam, dry, 3 to 12 percent slopes	colluvium and/or residuum weathered from sandstone and shale	65.3	3.3%
33	Fergus-Zoltay complex, 3 to 12 percent slopes	alluvium derived from sandstone and shale and/or colluvium	172.2	8.7%
34	Wrayha-Dollard-Fergus complex, 25 to 65 percent slopes, very stony	colluvium derived from sandstone and shale and/or residuum weathered from clayey shale	381.6	19.3%
53	Bodot-Mellenthin-Rock outcrop complex, 6 to 65 percent slopes, extremely stony	colluvium derived from sandstone and shale over residuum weathered from clayey shale	152.6	7.7%
64	Barx-Progresso complex, 3 to 12 percent slopes	alluvium derived from sandstone and shale and/or colluvium derived from sandstone and shale	5.6	0.3%
65	Progresso-Rock outcrop-Bowdish complex, 3 to 12 percent slopes, stony	residuum weathered from sandstone	154.9	7.8%
66	Bodot-Sili-Rock outcrop complex, 5 to 25 percent slopes, very bouldery	colluvium derived from sandstone and shale over residuum weathered from clayey shale	293.1	14.8%
67	Gladel-Bond-Rock outcrop complex, 3 to 25 percent slopes	residuum weathered from sandstone	74.7	3.8%
904	Rock outcrop, 50 to 99 percent slopes	residuum weathered from sandstone over residuum weathered from sandstone and shale	332.2	16.8%
Subtotals for Soil Survey Area			1,850.9	93.5%
Totals for Area of Interest			1,979.8	100.0%

Parent Material Name— Summary by Map Unit — Uncompahgre National Forest Area, Colorado, Parts of Mesa, Montrose, Ouray, and San Miguel Counties (CO676)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
10	Arabrab-Dalhart families complex, 3 to 15 percent slopes	residuum weathered from sandstone	29.4	1.5%
26	Mirand-Callan families-Chilson variant complex, 3 to 20 percent slopes	mixed loess over alluvium and/or materials derived from sandstone and shale	17.2	0.9%

Custom Soil Resource Report

Parent Material Name— Summary by Map Unit — Uncompahgre National Forest Area, Colorado, Parts of Mesa, Montrose, Ouray, and San Miguel Counties (CO676)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
32	Ustorthents-Ustochrepts-Rock outcrop complex, 40 to 150 percent slopes	sandy loam gravelly residuum over dakota sandstone	82.3	4.2%
Subtotals for Soil Survey Area			128.9	6.5%
Totals for Area of Interest			1,979.8	100.0%

Rating Options—Parent Material Name (Cross Section through Gateway Lease Tracts)

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Lower

Water Features

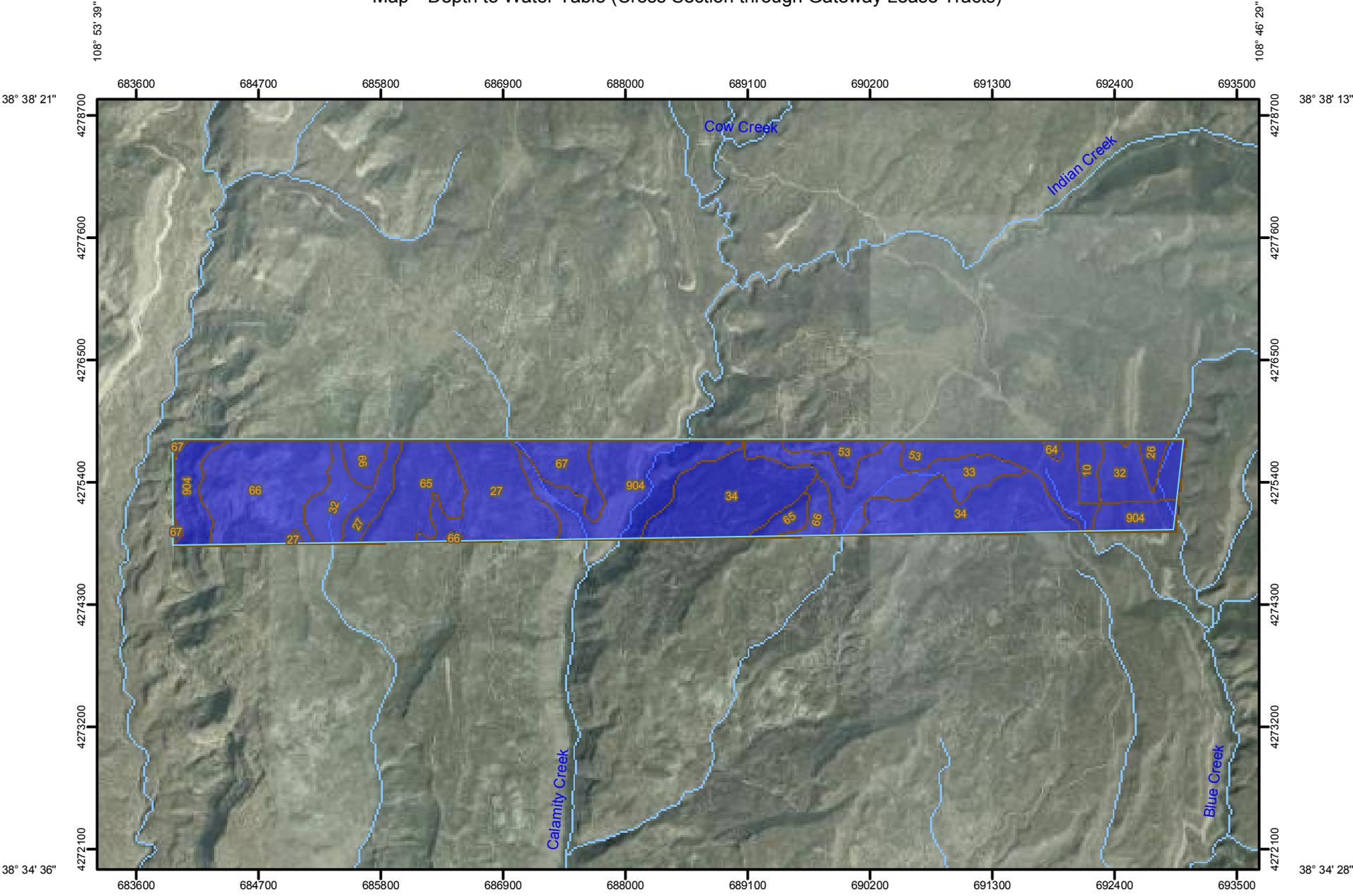
Water Features include ponding frequency, flooding frequency, and depth to water table.

Depth to Water Table (Cross Section through Gateway Lease Tracts)

"Water table" refers to a saturated zone in the soil. It occurs during specified months. Estimates of the upper limit are based mainly on observations of the water table at selected sites and on evidence of a saturated zone, namely grayish colors (redoximorphic features) in the soil. A saturated zone that lasts for less than a month is not considered a water table.

This attribute is actually recorded as three separate values in the database. A low value and a high value indicate the range of this attribute for the soil component. A "representative" value indicates the expected value of this attribute for the component. For this soil property, only the representative value is used.

Custom Soil Resource Report
Map—Depth to Water Table (Cross Section through Gateway Lease Tracts)



108° 53' 45"



Map Scale: 1:49,600 if printed on A size (8.5" x 11") sheet.



108° 53' 39"

4279700
4277600
4276500
4275400
4274300
4273200
4272100

683600 684700 685800 686900 688000 689100 690200 691300 692400 693500

108° 46' 29"

4278700
4277600
4276500
4275400
4274300
4273200
4272100

38° 38' 21"
38° 34' 36"

38° 38' 13"
38° 34' 28"

Custom Soil Resource Report

MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Units

Soil Ratings

 0 - 25

 25 - 50

 50 - 100

 100 - 150

 150 - 200

 > 200

Political Features

 Cities

Water Features

 Streams and Canals

Transportation

 Rails

 Interstate Highways

 US Routes

 Major Roads

MAP INFORMATION

Map Scale: 1:49,600 if printed on A size (8.5" × 11") sheet.

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for accurate map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>
Coordinate System: UTM Zone 12N NAD83

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Mesa County Area, Colorado
Survey Area Data: Version 3, Sep 25, 2007

Soil Survey Area: Uncompahgre National Forest Area, Colorado,
Parts of Mesa, Montrose, Ouray, and San Miguel Counties
Survey Area Data: Version 6, Mar 25, 2008

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

Date(s) aerial images were photographed: 8/28/2005

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—Depth to Water Table (Cross Section through Gateway Lease Tracts)

Depth to Water Table— Summary by Map Unit — Mesa County Area, Colorado (CO680)				
Map unit symbol	Map unit name	Rating (centimeters)	Acres in AOI	Percent of AOI
27	Rock outcrop-Biedsaw complex, 25 to 65 percent slopes, extremely bouldery	>200	218.8	11.1%
32	lles loam, dry, 3 to 12 percent slopes	>200	65.3	3.3%
33	Fergus-Zoltay complex, 3 to 12 percent slopes	>200	172.2	8.7%
34	Wrayha-Dollard-Fergus complex, 25 to 65 percent slopes, very stony	>200	381.6	19.3%
53	Bodot-Mellenthin-Rock outcrop complex, 6 to 65 percent slopes, extremely stony	>200	152.6	7.7%
64	Barx-Progresso complex, 3 to 12 percent slopes	>200	5.6	0.3%
65	Progresso-Rock outcrop-Bowdish complex, 3 to 12 percent slopes, stony	>200	154.9	7.8%
66	Bodot-Sili-Rock outcrop complex, 5 to 25 percent slopes, very bouldery	>200	293.1	14.8%
67	Gladel-Bond-Rock outcrop complex, 3 to 25 percent slopes	>200	74.7	3.8%
904	Rock outcrop, 50 to 99 percent slopes	>200	332.2	16.8%
Subtotals for Soil Survey Area			1,850.9	93.5%
Totals for Area of Interest			1,979.8	100.0%

Depth to Water Table— Summary by Map Unit — Uncompahgre National Forest Area, Colorado, Parts of Mesa, Montrose, Ouray, and San Miguel Counties (CO676)				
Map unit symbol	Map unit name	Rating (centimeters)	Acres in AOI	Percent of AOI
10	Arabrab-Dalhart families complex, 3 to 15 percent slopes	>200	29.4	1.5%
26	Mirand-Callan families-Chilson variant complex, 3 to 20 percent slopes	>200	17.2	0.9%
32	Ustorhents-Ustochrepts-Rock outcrop complex, 40 to 150 percent slopes	>200	82.3	4.2%
Subtotals for Soil Survey Area			128.9	6.5%
Totals for Area of Interest			1,979.8	100.0%

Rating Options—Depth to Water Table (Cross Section through Gateway Lease Tracts)

Units of Measure: centimeters

Aggregation Method: Dominant Component

Component Percent Cutoff: None Specified

Tie-break Rule: Lower

Interpret Nulls as Zero: No

Beginning Month: January

Ending Month: December

Flooding Frequency Class (Cross Section through Gateway Lease Tracts)

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

Frequency is expressed as none, very rare, rare, occasional, frequent, and very frequent.

"None" means that flooding is not probable. The chance of flooding is nearly 0 percent in any year. Flooding occurs less than once in 500 years.

"Very rare" means that flooding is very unlikely but possible under extremely unusual weather conditions. The chance of flooding is less than 1 percent in any year.

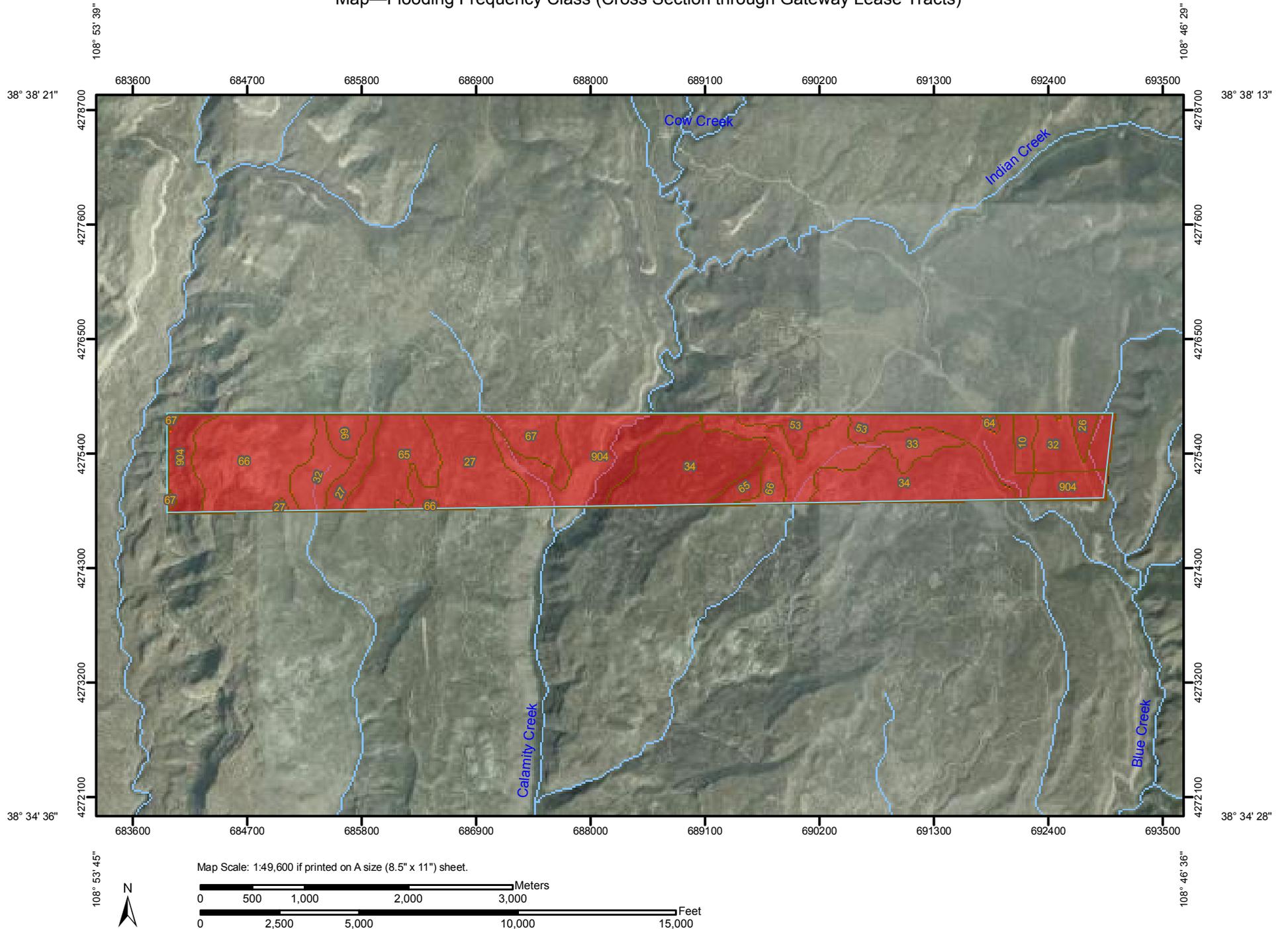
"Rare" means that flooding is unlikely but possible under unusual weather conditions. The chance of flooding is 1 to 5 percent in any year.

"Occasional" means that flooding occurs infrequently under normal weather conditions. The chance of flooding is 5 to 50 percent in any year.

"Frequent" means that flooding is likely to occur often under normal weather conditions. The chance of flooding is more than 50 percent in any year but is less than 50 percent in all months in any year.

"Very frequent" means that flooding is likely to occur very often under normal weather conditions. The chance of flooding is more than 50 percent in all months of any year.

Custom Soil Resource Report
Map—Flooding Frequency Class (Cross Section through Gateway Lease Tracts)



Custom Soil Resource Report

MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Units

Soil Ratings

 None

 Very Rare

 Rare

 Occasional

 Frequent

 Very Frequent

Political Features

 Cities

Water Features

 Streams and Canals

Transportation

 Rails

 Interstate Highways

 US Routes

 Major Roads

MAP INFORMATION

Map Scale: 1:49,600 if printed on A size (8.5" × 11") sheet.

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

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Please rely on the bar scale on each map sheet for accurate map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>
Coordinate System: UTM Zone 12N NAD83

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Mesa County Area, Colorado
Survey Area Data: Version 3, Sep 25, 2007

Soil Survey Area: Uncompahgre National Forest Area, Colorado,
Parts of Mesa, Montrose, Ouray, and San Miguel Counties
Survey Area Data: Version 6, Mar 25, 2008

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

Date(s) aerial images were photographed: 8/28/2005

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—Flooding Frequency Class (Cross Section through Gateway Lease Tracts)

Flooding Frequency Class— Summary by Map Unit — Mesa County Area, Colorado (CO680)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
27	Rock outcrop-Biedsaw complex, 25 to 65 percent slopes, extremely bouldery	None	218.8	11.1%
32	Iles loam, dry, 3 to 12 percent slopes	None	65.3	3.3%
33	Fergus-Zoltay complex, 3 to 12 percent slopes	None	172.2	8.7%
34	Wrayha-Dollard-Fergus complex, 25 to 65 percent slopes, very stony	None	381.6	19.3%
53	Bodot-Mellenthin-Rock outcrop complex, 6 to 65 percent slopes, extremely stony	None	152.6	7.7%
64	Barx-Progresso complex, 3 to 12 percent slopes	None	5.6	0.3%
65	Progresso-Rock outcrop-Bowdish complex, 3 to 12 percent slopes, stony	None	154.9	7.8%
66	Bodot-Sili-Rock outcrop complex, 5 to 25 percent slopes, very bouldery	None	293.1	14.8%
67	Gladel-Bond-Rock outcrop complex, 3 to 25 percent slopes	None	74.7	3.8%
904	Rock outcrop, 50 to 99 percent slopes	None	332.2	16.8%
Subtotals for Soil Survey Area			1,850.9	93.5%
Totals for Area of Interest			1,979.8	100.0%

Flooding Frequency Class— Summary by Map Unit — Uncompahgre National Forest Area, Colorado, Parts of Mesa, Montrose, Ouray, and San Miguel Counties (CO676)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
10	Arabrab-Dalhart families complex, 3 to 15 percent slopes	None	29.4	1.5%
26	Mirand-Callan families-Chilson variant complex, 3 to 20 percent slopes	None	17.2	0.9%
32	Ustorthents-Ustochrepts-Rock outcrop complex, 40 to 150 percent slopes	None	82.3	4.2%
Subtotals for Soil Survey Area			128.9	6.5%
Totals for Area of Interest			1,979.8	100.0%

Rating Options—Flooding Frequency Class (Cross Section through Gateway Lease Tracts)

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: More Frequent

Beginning Month: January

Ending Month: December

Ponding Frequency Class (Cross Section through Gateway Lease Tracts)

Ponding is standing water in a closed depression. The water is removed only by deep percolation, transpiration, or evaporation or by a combination of these processes. Ponding frequency classes are based on the number of times that ponding occurs over a given period. Frequency is expressed as none, rare, occasional, and frequent.

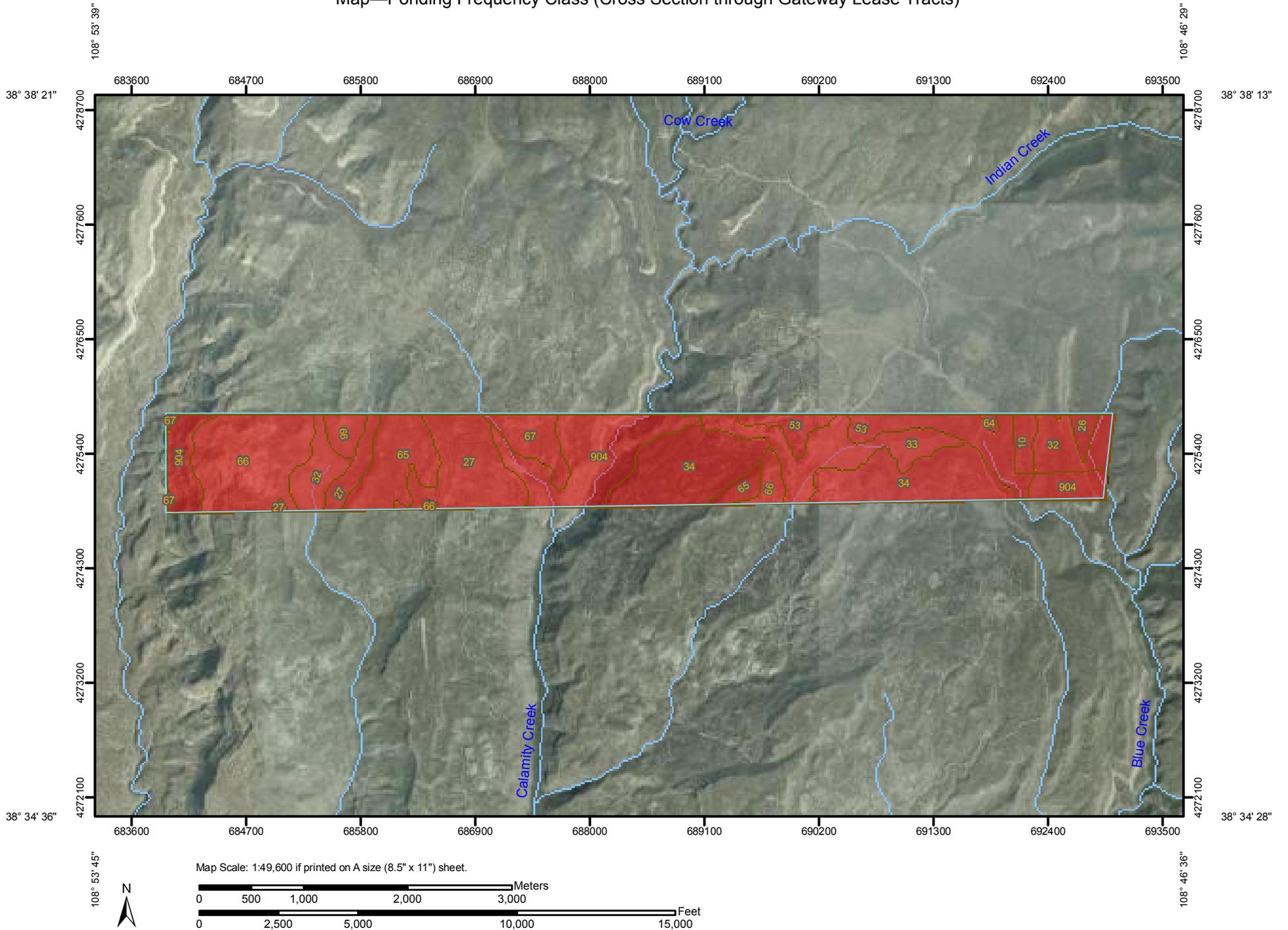
"None" means that ponding is not probable. The chance of ponding is nearly 0 percent in any year.

"Rare" means that ponding is unlikely but possible under unusual weather conditions. The chance of ponding is nearly 0 percent to 5 percent in any year.

"Occasional" means that ponding occurs, on the average, once or less in 2 years. The chance of ponding is 5 to 50 percent in any year.

"Frequent" means that ponding occurs, on the average, more than once in 2 years. The chance of ponding is more than 50 percent in any year.

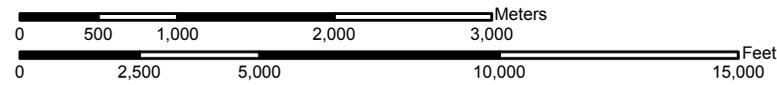
Custom Soil Resource Report
Map—Ponding Frequency Class (Cross Section through Gateway Lease Tracts)



108° 53' 45"



Map Scale: 1:49,600 if printed on A size (8.5" x 11") sheet.



108° 53' 39"

108° 46' 29"

38° 38' 21"

38° 38' 13"

38° 34' 36"

38° 34' 28"

108° 53' 45"

108° 46' 36"

Custom Soil Resource Report

MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Units

Soil Ratings

 None

 Rare

 Occasional

 Frequent

Political Features

 Cities

Water Features

 Streams and Canals

Transportation

 Rails

 Interstate Highways

 US Routes

 Major Roads

MAP INFORMATION

Map Scale: 1:49,600 if printed on A size (8.5" x 11") sheet.

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

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Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>
Coordinate System: UTM Zone 12N NAD83

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

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Survey Area Data: Version 3, Sep 25, 2007

Soil Survey Area: Uncompahgre National Forest Area, Colorado,
Parts of Mesa, Montrose, Ouray, and San Miguel Counties
Survey Area Data: Version 6, Mar 25, 2008

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Date(s) aerial images were photographed: 8/28/2005

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—Ponding Frequency Class (Cross Section through Gateway Lease Tracts)

Ponding Frequency Class— Summary by Map Unit — Mesa County Area, Colorado (CO680)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
27	Rock outcrop-Biedsaw complex, 25 to 65 percent slopes, extremely bouldery	None	218.8	11.1%
32	Iles loam, dry, 3 to 12 percent slopes	None	65.3	3.3%
33	Fergus-Zoltay complex, 3 to 12 percent slopes	None	172.2	8.7%
34	Wrayha-Dollard-Fergus complex, 25 to 65 percent slopes, very stony	None	381.6	19.3%
53	Bodot-Mellenthin-Rock outcrop complex, 6 to 65 percent slopes, extremely stony	None	152.6	7.7%
64	Barx-Progresso complex, 3 to 12 percent slopes	None	5.6	0.3%
65	Progresso-Rock outcrop-Bowdish complex, 3 to 12 percent slopes, stony	None	154.9	7.8%
66	Bodot-Sili-Rock outcrop complex, 5 to 25 percent slopes, very bouldery	None	293.1	14.8%
67	Gladel-Bond-Rock outcrop complex, 3 to 25 percent slopes	None	74.7	3.8%
904	Rock outcrop, 50 to 99 percent slopes	None	332.2	16.8%
Subtotals for Soil Survey Area			1,850.9	93.5%
Totals for Area of Interest			1,979.8	100.0%

Ponding Frequency Class— Summary by Map Unit — Uncompahgre National Forest Area, Colorado, Parts of Mesa, Montrose, Ouray, and San Miguel Counties (CO676)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
10	Arabrab-Dalhart families complex, 3 to 15 percent slopes	None	29.4	1.5%
26	Mirand-Callan families-Chilson variant complex, 3 to 20 percent slopes	None	17.2	0.9%
32	Ustorthents-Ustochrepts-Rock outcrop complex, 40 to 150 percent slopes	None	82.3	4.2%
Subtotals for Soil Survey Area			128.9	6.5%
Totals for Area of Interest			1,979.8	100.0%

Rating Options—Ponding Frequency Class (Cross Section through Gateway Lease Tracts)

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Custom Soil Resource Report

Tie-break Rule: More Frequent

Beginning Month: January

Ending Month: December

References

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

National Research Council. 1995. Wetlands: Characteristics and boundaries.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. <http://soils.usda.gov/>

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. <http://soils.usda.gov/>

Soil Survey Staff. 2006. Keys to soil taxonomy. 10th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. <http://soils.usda.gov/>

Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.

United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.

United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. <http://soils.usda.gov/>

United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. <http://www.glti.nrcs.usda.gov/>

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. <http://soils.usda.gov/>

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. <http://soils.usda.gov/>

Custom Soil Resource Report

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210.