
Wetland Delineation Report
Silver Mountain
Summit County, Colorado

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1.0 Introduction

The 86 acre Silver Mountain project site is located along U.S. Highway 9, about 1.4 miles north of the Interstate 70 and U.S. Highway 9 interchange in Silverthorne. Specifically, the property is located in Sections 1 and 2, Township 5 South, and Range 78 West in Summit County, Colorado (Figure 1). About half of the property is within Silverthorne corporate limit. Wetlands on the project site were delineated in order to provide data to plan a housing development.

2.0 Ecological Setting

Silver Mountain is located on gently sloping valley benched and alluvial terraces along the Blue River. Elevations of the project site range from 8,880 feet in the southwest to about 8,7000 feet along U.S. Highway 9. The topography which slopes toward the east, varies from steep to relatively gentle slope. A country road traverses the southern edge of the project site.

Two drainages conduct water from the Gore Mountain Range to the west to the Blue River east of the project site. Willow Creek, a perennial stream, flows along the northern edge of the property and an intermittent stream, with a large area of beaver dams, flows along the southern property boundary between steep hillside and the county road. The natural flow of this stream ends at the headgate on the north side of the county road. From the headgate water either flow to the hay fields on the Silver Mountain, or to a ditch along the county road to U.S. Highway 9.

The Silver Mountain has been an active ranch for well over 100 years. The vast majority of the site is flood irrigated to produce one annual hay crop. In some years, cattle over grazed following hay harvest.

3.0 Methods

Wetland boundaries were delineated according to procedures outlined in the U.S. Army Corps of Engineers Wetland Delineation Manual (1987). An onsite wetland determination procedure was conducted following guidelines for areas less than 5 acres in size. Wetland boundaries were delineated and flagged based on the prevalence of hydrophytic vegetation, hydric soils, and indicators of a wetland hydrology. Wetlands were also classified according to procedures in the Classification of Wetland and Deepwater Habits of the United States (Cowardin et al. 1979).

On May 5 and 6, 1997, Daryl Mergen conducted the vegetation and hydrology analysis and Dave Buscher, a soil scientist, completed the soils identification. Field forms for the soils, vegetation, and hydrology data are in Appendix A. Plant names are according to Kartesz (1994a, 1994b) and the wetland status for each plant is according to Reed (1998).

4.0 Agency Coordination

David Johnson and Daryl Mergen met with Michael Claffey of the U.S. Army Corps of Engineers at the project site on May 22, 1997, to review the wetland delineation. Most of the project site is flood irrigated throughout the growing season and was being flood irrigated during

the wetland delineation process. However, during Mr. Claffey's visit, the flood irrigation practices were not in use. Mr. Claffey proposed the use of ground water monitor wells to determine the source of hydrology for many potential wetland areas. A ground water hydrology-monitoring program, as discussed in Section 4.0, was implemented.

David Johnson and Mike Claffey met again at the project site on June 23, 1997, to review wetlands and discuss the results of the hydrology monitoring. During that second meeting, Mr. Claffey made minor changes to the flagged wetland boundaries and determined that the remainder of the area was accurately delineated. The delineated wetlands were surveyed by Bucklund Land surveys of Frisco, Colorado.

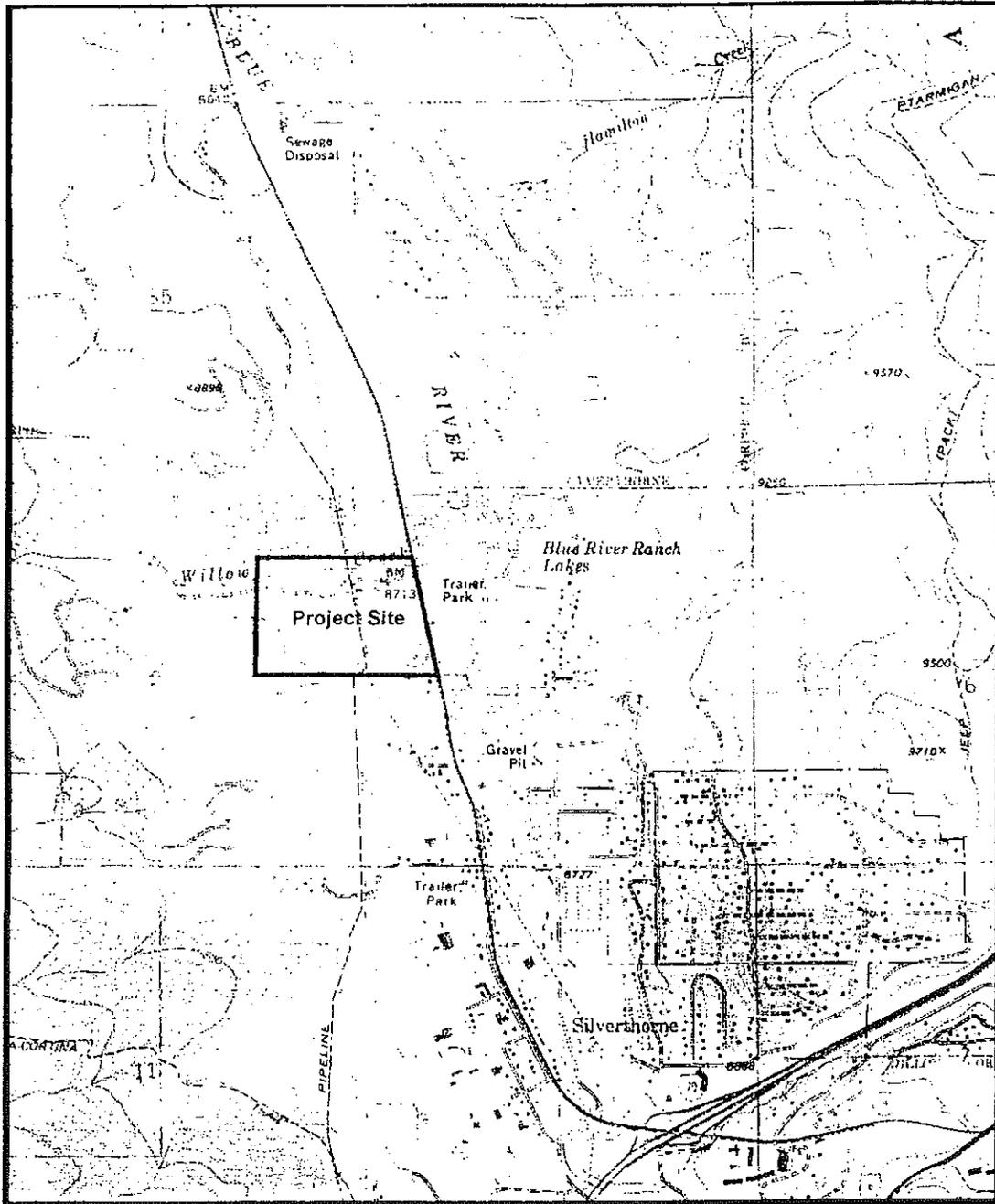
5.0 Ground Water Hydrology Monitoring

Flood irrigation on the Silver Mountain begins in early spring immediately following snowmelt. Spring runoff is directed onto the hay meadows through a system of irrigation ditches and diversions set the previous fall. This distribution of snowmelt water to the meadows continues until sometime between May 15 and June 15 when active irrigation efforts begin. No irrigation water is applied to the hay meadows during the month of August, the hay cutting time. Once the hay has been cut and bailed, irrigation water is again directed to the hay meadows and continues into November.

A ground water hydrology monitoring study was conducted to collect data to separate the wetland with a natural hydrology from areas of hydrophytic vegetation with a flood irrigation induced hydrology. Twenty-one groundwater monitoring wells were dug to a depth of 12 inches in potential wetlands, flood irrigation practices were terminated on May 26, 1997, and the soil condition (saturated, unsaturated) evaluated on June 5, 1997. Figure 2 illustrates the location of the ground water monitoring wells. Please note, several precipitation events occurred during the period of time when hydrology monitoring was in progress.

Five of the hydrology monitor well sites had a natural wetland hydrology, and 15 well sites had a wetland hydrology induced by flood irrigation (Table 1). Monitor well sites 3, 10, 13, and 18 had saturated soils in the upper 12 inches of the soil profile, sites 20 and 21 were inundated. Site 2 was located on mounded soil above an area of soil inundation, therefore, was not representative of the adjacent areas. Soils at well site 15, 16, and 17 would likely have been saturated if the diversion ditch just east of well 18 had not been recently dug.

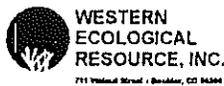
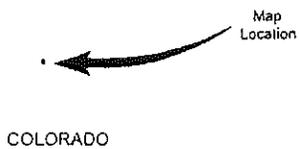
R 78 W R 77 W



T 4 S T 5 S

BASE: USGS 7.5 Minute Dillon, Colorado Quadrangle

FIGURE 1. Project Location Map



Scale 1" = 2000'
 Contour Interval = 40'

Figure 2 - Wetlands Map

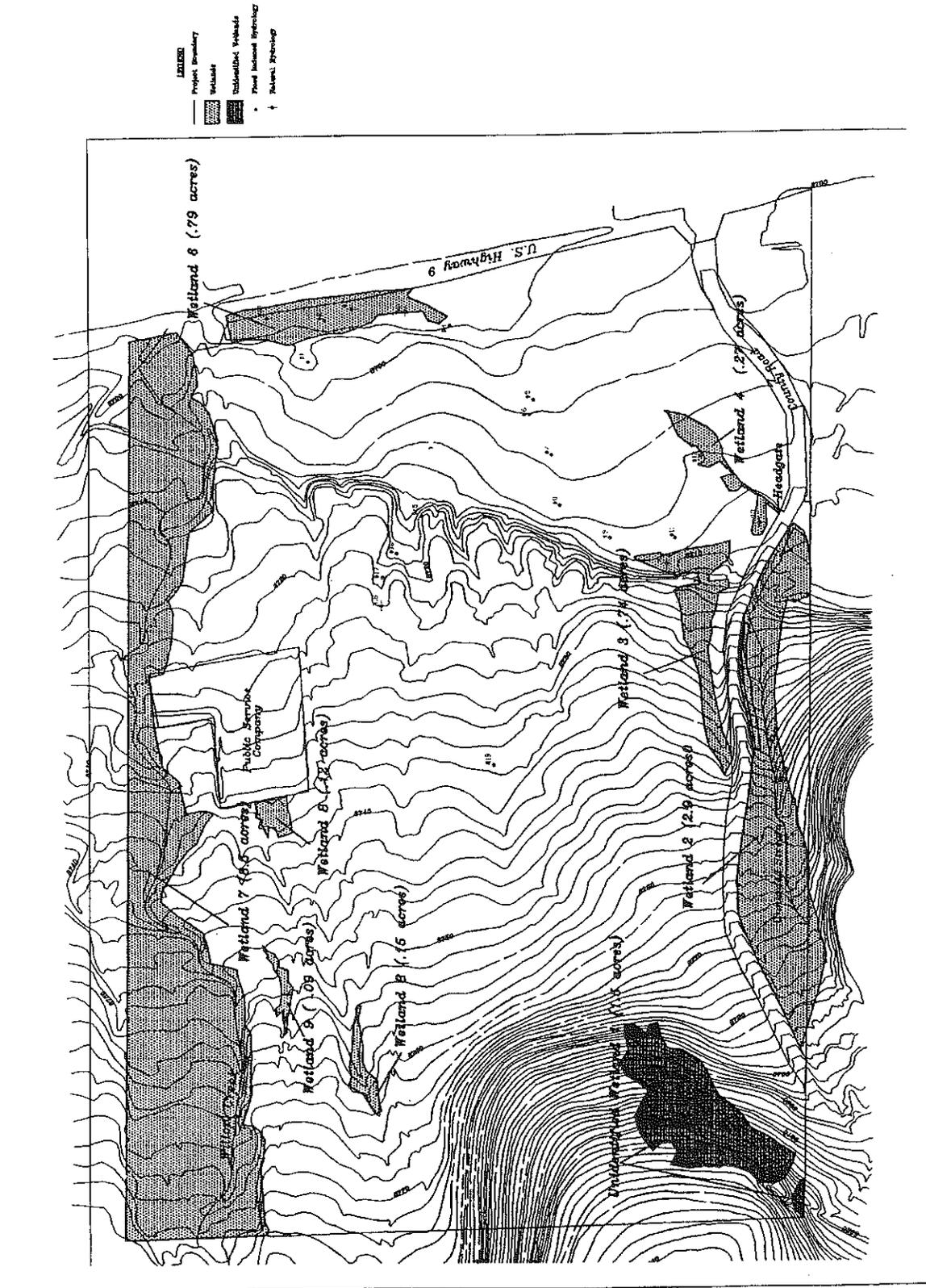


TABLE 1
Results of the hydrology monitoring

Well No.	Dominant Plants	Soil Condition	Natural Wetland Hydrology (Yes/No)
1	<i>Carex nebrascensis</i> <i>Alopecurus pratensis</i>	Dry	No
2 *	<i>Salix</i> spp. <i>Heracleum maximum</i>	Dry	No
3	<i>Carex nebrascensis</i> <i>Alopecurus pratensis</i> <i>Carex utriculata</i>	Saturated at 12"	Yes
4	<i>Carex nebrascensis</i> <i>Alopecurus pratensis</i> <i>Taraxacum officinale</i>	Moist	No
5	<i>Taraxacum officinale</i> <i>Alopecurus pratensis</i> <i>Poa</i> spp. <i>Phleum pratense</i>	Dry	No
6	<i>Carex nebrascensis</i> <i>Alopecurus pratensis</i> <i>Taraxacum officinale</i> <i>Phleum pratense</i>	Dry at surface, subsurface moist	
7	<i>Carex nebrascensis</i> <i>Alopecurus pratensis</i> <i>Taraxacum officinale</i> <i>Carex utriculata</i>	Less moist than wells 5 & 6	No
8	<i>Carex nebrascensis</i> <i>Alopecurus pratensis</i> <i>Taraxacum officinale</i> <i>Phleum pratense</i> <i>Carex utriculata</i> <i>Rorippa sinuata</i>	Dry	No
9	<i>Carex nebrascensis</i> <i>Alopecurus pratensis</i> <i>Taraxacum officinale</i> <i>Carex utriculata</i>	Dry, thick clay layer 6- 10" below surface	No
10	<i>Salix</i> spp.	Saturated at 11"	Yes
11	<i>Carex nebrascensis</i> <i>Bromus inermis</i> <i>Carex utriculata</i> <i>Taraxacum officinale</i>	Very dry	No
12	<i>Salix</i> spp. <i>Equisetum arvense</i> <i>Carex utriculata</i> <i>Carex canescens</i>	Dry at surface, moist at 12"	No

TABLE 1 (Continued)
Results of the hydrology monitoring

Well No.	Dominant Plants	Soil Condition	Natural Wetland Hydrology (Yes/No)
13	<i>Carex utriculata</i>	Saturated at 9"	Yes
14	<i>Bromus inermis</i>	Dry	No
15 **	<i>Carex canescens</i> <i>Juncus balticus</i> <i>Taraxacum officinale</i> <i>Alopecurus pratensis</i>	Dry, very shallow (6") with tightly packed cobbles from 6-12"	No
16 **	<i>Carex canescens</i> <i>Juncus balticus</i> <i>Carex nebrascensis</i> <i>Eleocharis palustris</i>	Surface damp, below surface dry and very cobbly.	No
17 **	<i>Pedicularis groenlandica</i> <i>Carex canescens</i> <i>Juncus balticus</i> <i>Carex nebrascensis</i> <i>Carex utriculata</i> <i>Taraxacum officinale</i>	Dry, below recently excavated ditch	No
18 #	<i>Pedicularis groenlandica</i> <i>Carex canescens</i> <i>Juncus balticus</i> <i>Carex nebrascensis</i> <i>Carex utriculata</i>	Saturated from seepage above recently excavated ditch	Yes
19	<i>Taraxacum officinale</i> <i>Alopecurus pratensis</i> <i>Carex nebrascensis</i>	Dry	No
20	<i>Salix</i> spp. <i>Heracleum maximum</i>	10" of inundation	Yes
21	<i>Salix</i> spp. <i>Heracleum maximum</i> <i>Carex nebrascensis</i> <i>Carex utriculata</i>	1" of inundation	Yes
*	Located on mounded soil above soil inundation		
**	Located downslope from recently excavated ditch. Would likely have been saturated if the ditch had not intercepted upslope water		
#	Located upslope of a recently excavated ditch		

TABLE 2
Wetland Plant Species List

Scientific Name	Common Name	Plant Family	Origin *	Wetland Status **
Trees				
<i>Picea engelmannii</i>	Engelmann spruce	Pinaceae	N	FACU-*
<i>Picea pungens</i>	Colorado blue spruce	Pinaceae	N	FAC-
<i>Populus tremuloides</i>	Aspen	Salicaceae	N	FAC
<i>Pseudotsuga menziesii</i>	Douglas Fir	Pinaceae	N	NL
Shrubs				
<i>Artemisia tridentata</i>	Big sagebrush	Asteraceae	N	NL
<i>Betula occidentalis</i>	River birch	Betulaceae	N	FACW
<i>Chrysothamnus nauseosus</i>	Rabbitbrush	Asteraceae	N	NL
<i>Lonicera morrowii</i>	Fly honeysuckle	Caprifoliaceae	I	NL
<i>Pentaphylloides floribunda</i>	Shrubby cinquefoil	Rosaceae	N	FACW*
<i>Ribes aureum</i>	Yellow currant	Grossulariaceae	N	FACW
<i>Rosa woodsii</i>	Wood rose	Rosaceae	N	FAC-
<i>Salix monticola</i>	Mountain Willow	Salicaceae	N	OBL
<i>Salix planifolia</i>	Plainleaf willow	Salicaceae	N	NI
<i>Salix spp.</i>	Willow	Salicaceae	N	
Perennial Graminoids				
<i>Agrostis gigantea (alba)</i>	Redtop	Poaceae	I	FACW
<i>Alopecurus pratensis</i>	Meadow foxtail	Poaceae	I	NI
<i>Bromus inermis</i>	Smooth brome	Poaceae	I	NL
<i>Carex canescens</i>	Hoary sedge	Cyperaceae	N	OBL
<i>Carex nebrascensis</i>	Nebraska sedge	Cyperaceae	N	OBL
<i>Carex praegracilis</i>	Clustered field sedge	Cyperaceae	N	FACW
<i>Carex utriculata (rostrata)</i>	Beaked sedge	Cyperaceae	N	OBL
<i>Dactylis glomerata</i>	Orchard grass	Poaceae	I	FACU
<i>Eleocharis palustris</i>	Creeping spikerush	Cyperaceae	N	OBL
<i>Elymus trachycaulus</i>	Slender wheatgrass	Poaceae	N	FACU
<i>Festuca pratense</i>	Meadow fescue	Poaceae	I	FACU
<i>Juncus balticus</i>	Baltic rush	Juncaceae	N	FACW
<i>Pascopyrum smithii</i>	Western wheatgrass	Poaceae	N	FACU
<i>Phleum pratense</i>	Timothy	Poaceae	I	FACU
<i>Poa compressa</i>	Canada bluegrass	Poaceae	N	FACU
<i>Poa pratensis</i>	Kentucky bluegrass	Poaceae	I	FACU

TABLE 2 (Continued)
Wetland Plant Species List

Scientific Name	Common Name	Plant Family	Origin *	Wetland Status **
Perennial Forbs				
<i>Achillea millefolium</i>	Common yarrow	Asteraceae	N	FACU
<i>Cardaria draba</i>	Whitetop	Brassicaceae	I	NL
<i>Cirsium arvense</i>	Canada thistle	Asteraceae	I	FACU
<i>Epilobium spp.</i>	Willowherb	Onagraceae	N	FAC
<i>Equisetum arvense</i>	Field horsetail	Equisetaceae	N	FAC+
<i>Geranium richardsonii</i>	Geranium	Geraniaceae	N	FACU
<i>Heracleum maximum</i>	Cow parsnip	Apiaceae	N	FAC
<i>Iris missouriensis</i>	Rocky Mountain iris	Iridaceae	N	OBL*
<i>Pedicularis groenlandica</i>	Elephantella	Scrophulariaceae	N	OBL
<i>Rorippa sinuata</i>	Yellow cress	Brassicaceae	N	OBL
<i>Rumex crispus</i>	Curly dock	Polygonaceae	I	FACW
<i>Taraxacum officinale</i>	Dandelion	Asteraceae	I	FACU+

Annual/Biennial Forbs

<i>Cynoglossum officinale</i>	Houndstongue	Boraginaceae	I	NL
<i>Melilotus officinalis</i>	Sweetclover	Fabaceae	I	FACU
<i>Tragopogon dubius</i>	Salsify	Asteraceae	I	NL

*** Origin**

I	Introduced
N	Native

**** Wetland Status**

OBL	Obligate
FACW	Facultative wet
FAC	Facultative
FACU	Facultative upland
UPL	Obligate upland
NI	No indicator
NL	Not listed

6.0 Results

The project is characterized by dense willow stands, sedge meadows, streams, and numerous beaver dams (Figure 2). Ten wetlands were delineated and described. The plant species present in these wetlands are listed in Table 2. Field data on the vegetation, soil, and hydrology of these wetlands is in Appendix A.

6.1 Wetland 1

Wetland 1 is a dense willow stand located on a moderately sloping hill at the southwest corner of the property. Wetland 1 is classified as a Palustrine system, with a scrub-shrub wetland class (Cowardin et al. 1979).

6.1.1 Vegetation

This dense woody wetland is dominated by mountain willow (*Salix monticola*), plainleaf willow (*Salix planifolia*), and shrubby cinquefoil (*Pentaphylloides floribunda*). The understory around the margin of the wetland includes beaked sedge (*Carex utriculata*), Baltic rush (*Juncus balticus*), redtop (*Agrostis alba*), and curly dock (*Rumex crispus*). Little herbaceous vegetation is present within the shaded understory near the center of the willow stand.

6.1.2 Hydrology

Water for this wetland is supplied by snowmelt, flood irrigation, seepage from an upslope irrigation ditch, and possibly springs and seeps.

6.1.3 Soils

Four soil samples were taken around the perimeter of the willow stand. These soils had hydric characteristics including mottles and saturation. One soil sample is on the hydric soils list. Texture for the hydric soils was loam to clay loam and the drainage class was moderate to somewhat poorly drained.

6.2 Wetland 2

Wetland 2 occurs along the unnamed drainage and between a steep hillside to the south and the county road to the north. Several beaver dams have been constructed along this wetland and irrigation water is diverted into and out of this wetland complex. Two small upland areas occur within this wetland. This willow/sedge wetland is classified as a Palustrine system with a scrub-shrub wetland (Cowardin et al. 1979).

6.2.1 Vegetation

This wetland has mountain willow, plainleaf willow, and river birch (*Betula occidentalis*). The dominant understory herbaceous species is beaked sedge. Smooth brome (*Bromus inermis*) occurs on the two small uplands mapped within this wetland.

6.2.2 Hydrology

This entire wetland is within natural drainage that carries snowmelt, surface runoff, and irrigated water through the entire wetland. At the east end of Wetland 2, water is diverted under the county road to an irrigation headgate. From the headgate, water can be diverted northeast to the hay meadow on the Silver Mountain, or east into a ditch along the county road and under U.S. Highway 9 to the Blue River. Beaver ponds are common through the wetland.

6.2.3 Soils

Soils were mapped as wetland soils (Cumulic cryaquoll) which are listed on the local hydric soils list (SCS 1980). These poorly drained soils occur on flood plains and are often flooded. Soil texture ranges from a sandy loam to clay. Much of the soil in Wetland 2 was saturated or inundated.

6.3 Wetland 3

Wetland 3, a natural drainage channel, was likely cut off from the unnamed stream when the county road to the south was constructed. It extends from the county road to the bottom of a slope in the hay meadow. This willow shrubland is a Palustrine scrub-shrub wetland (Cowardin et al. 1979).

6.3.1 Vegetation

Shrubby cinquefoil (*Pentaptyloides floribunda*) and several species of willows make up the woody components of this wetland. The herbaceous understory is a mixture of smooth brome, Kentucky bluegrass, timothy (*Phleum pratense*), and Baltic rush. Curly dock and Rocky Mountain iris (*Iris missouriensis*) are the major forbs present.

6.3.2 Hydrology

Snowmelt provides a source of water for this wetland in early spring. This wetland probably receives some irrigation return flows. These return flows continue down the natural channel and are then diverted onto the flat topography of the lower hay. The wetland also may be subirrigated.

6.3.3 Soils

The hydric soils present have mottles, oxidized root channels, soil saturation, a low chroma color, and an aquic moisture regime. Soil texture was loam to clay loam and the drainage class varied from moderately well to poorly drained.

6.4 Wetland 4

Wetland 4 is a willow/sedge community along the abandoned channel of the unnamed stream which flows along the south property boundary. This wetland is identified in the Soil Survey of Summit County as a drainage (SCS 1980). Included in this wetland is a two foot wide ditch which directs irrigation water across the pasture from the headgate located near the county road. The southwest portion of this wetland is classified as an emergent wetland class, and the northern portion is a scrub-shrub wetland class (Cowardin et al. 1979), both of the Palustrine system

6.4.1 Vegetation

Woody vegetation consisting of widely spaced willows, a few river birch and a narrowleaf cottonwood (*Populus angustifolia*) tree occur along this wetland. The herbaceous component of the wetland is beaked sedge, hoary sedge (*Carex canescens*), and Baltic rush.

6.4.2 Hydrology

The hydrology of this wetland has been altered by irrigation practices possibly during the construction of the county road. Surface water runoff and irrigation water saturates this wetland during portions of the growing season. Large rocks and a meandering channel can still be seen through portions of this wetland, indicating a natural channel. Oxidized root channels were also present in this wetland, indicating frequent inundation. However, when all irrigation water is diverted past this wetland, soils become dry.

6.4.3 Soils

Small hummocks on the soil surface of the poorly drained Cumulic cryaquoll soils indicate hydric conditions. Saturated soils, low chroma colors, mottles, and an aquic moisture regime were additional indicators of hydric soils. Large woody roots were found within the herbaceous areas, indicating this site may have been populated by willows in the past.

6.5 Wetland 5

Wetland 5 is a sedge meadow, in an area mined for gravel in 1985 and 1986. It has a very shallow layer of soil over a very cobbly subsurface. Wetland 5 was classified as a Palustrine system with an emergent wetland class (Cowardin et al 1979).

6.5.1 Vegetation

This wetland has a diverse species composition, including Nebraska sedge (*Carex nebrascensis*), beaked sedge, and hoary sedge in the wetter areas, and clustered field sedge (*Carex praegracilis*) and Baltic rush in dryer areas. Redtop, meadow foxtail (*Alopecurus pratensis*), Canada bluegrass (*Poa compressa*), and timothy are common. Rocky Mountain iris, yellow cress (*Rorippa sinuata*) and elephantella (*Pedicularis groenlandica*) are the major forbs present.

6.5.2 Hydrology

After the gravel was removed, a seep developed along the west side of the wetland, at the base of the contoured slope. In addition to the seep, irrigation water, and water from snowmelt and precipitation events flow to this wetland.

6.5.3 Soils

Indicators of hydric soils in Wetland 5 includes the saturated soil conditions, mottles, and oxidized root channels.

6.6 Wetland 6

The linear shaped Wetland 6 is located on the east edge of the project site along U.S. Highway 9. This wetland may have formed when U.S. Highway 9 was constructed. The southern one quarter of the wetland was classified as an emergent wetland class, and the remaining area is a scrub-shrub wetland class (Cowardin et al. 1979). Both are in the Palustrine system.

6.6.1 Vegetation

A dense stand of willows is present throughout most of this wetland except for the southern end which has a stand of Nebraska sedge and water sedge. In the wetter understory, along the eastern half of the wetland, water sedge is the dominant plant, whereas on the dryer western half, cow parsnip (*Heracleum maximum*), meadow foxtail, and Baltic rush were the dominant plants of the understory.

6.6.2 Hydrology

Water flows from the north end of the wetland to the south end even when all irrigation water has been diverted, suggesting subsurface flows from Willow Creek to the north. In addition, storm water runoff and much of the spring snowmelt water accumulates in this wetland during the spring. Irrigation practices also contribute a considerable amount of water to this wetland throughout the growing season.

6.6.3 Soils

The somewhat poorly drained loam soils of this wetland contain mottles and low chroma colors, and has an aquatic moisture regime. In addition, much of the area was saturated to the soil surface and some places had several inches of standing water.

6.7 Wetland 7

Wetland 7 is a riparian willow stand nourished by Willow Creek. This large wetland had a very dense willow overstory and includes stands of sedge, gravelly sandbars, and the stream channel. This wetland was classified into two different systems (Cowardin et al. 1979). The actual channel of Willow Creek was identified as a Riverine system with a rock bottom class and rubble subclass. The area between the stream channel and the uplands was classified as a Palustrine system, with a scrub-shrub class.

6.7.1 Vegetation

River birch and shrubby cinquefoil occur amid the dense stand of willows throughout this riparian willow wetland. Located on some elevated sand bars within the willows stands are dense stands of beaked sedge.

6.7.2 Hydrology

Willow Creek, a perennial stream with adjacent flow channels, flows east along the northern edge of the property and into the Blue River located east of the property. This stream channel carries snowmelt water from the Gore Mountain Range located to the west.

6.7.3 Soils

Soils were mapped as a gravelly loam soil, a well drained alluvial soil found on river terraces. No soil pits were sampled along this wetland because of the sharp contrast between the obligate wetland plants and the adjacent upland vegetation.

6.8 Wetland 8

This small wetland, adjacent to the Public Service Company property, is located within an old abandoned stream channel. This wetland is a willow/sedge wetland, classified as a Palustrine system with a Scrub-shrub wetland (Cowardin et al. 1979).

6.8.1 Vegetation

Willows and shrubby cinquefoil compose this overstory of this wetland. Herbaceous species present in the understory include clustered field sedge, beaked sedge, Kentucky bluegrass, yarrow (*Achillea millefolium*), and smooth brome, an upland plant.

6.8.2 Hydrology

Water in Wetland 8 results from snowmelt, overland runoff water, and probably from subsurface flow through the cobbly surface of the soils. Wetland 8 is north of the Public Service Company property, which has a ditch along the western edge of the lot to conduct water back to Willow Creek. This ditch appears to have water present during the growing season, indicating subsurface flow is occurring throughout Wetland 8. However, the old natural channel has been interrupted and water flowing from the wetlands upslope is currently diverted across the hay meadows.

6.8.3 Soils

The soils in Wetland 8 are in a moderate to poor drainage class, and consists of loam to gravel sandy loam in texture. Large cobbles were present at a depth of eight inches. Indicators of hydric conditions include aquic moisture regime and low chroma colors. In addition, just ten feet from the sample site about one inch of standing water was present on the soil surface.

6.9 Wetland 9

The linear shaped Wetland 9 occurs in what appears to be an old channel of Willow Creek. This wetland is a grass/sedge wetland with a few small willows. It is a Palustrine system with an emergent wetland class (Cowardin et al. 1979).

6.9.1 Vegetation

Redtop was the dominant vegetation within Wetland 9. Species with less cover include beaked sedge, clustered field sedge, curly dock, cow parsnip, and a willowherb (*Epilobium* spp.). The few willows present appear to have been mowed.

6.9.2 Hydrology

Subsurface flow from Willow Creek probably supplies this wetland with water during periods of high runoff. Surface runoff and water from snowmelt flows into the depression channel. Irrigation water may also supplement the natural hydrology of this wetland.

6.9.3 Soils

The somewhat poorly drained soil has a loam texture in the top six inches and a sandy loam soil below with some gravel. An aquic moisture regime was the primary indicator of hydric soils.

6.10 Wetland 10

Wetland 10 is located at the northern end of a large sedge meadow extending from the west onto the Silver Mountain. This wetland lies within a natural drainage. This wetland is classified as a Palustrine system with an emergent wetland class (Cowardin et al. 1979).

6.10.1 Vegetation

Beaked sedge and Nebraska sedge account for most of the vegetation within Wetland 10. There are a few willows along the southern edge of the wetland, the hillside, and the eastern edge where it begins to constrict into a channel. Timothy, Kentucky bluegrass, and redtop, and the forb dandelion (*Taraxacum officinale*) are present around the margin of this wetland in dryer habitats.

6.10.2 Hydrology

Snowmelt supplies much of the water to this wetland well into May, as indicated by the considerable snow dept still present along the southwest edge of the wetland, as observed during the delineation. Runoff from the adjacent property to the west and the hillside to the south, also supply water to this wetland. Also being in a slight depression and somewhat close to Willow Creek, subsurface flows may occur. Springs may occur in this wetland west of the property boundary. All water flowing through Wetland 10 is diverted across the hay meadows for irrigation.

6.10.3 Soils

Saturated soils occur throughout the wetland for a considerable portion of the growing season. Soils sampled upslope of this wetland were hydric and dry during the sample period, but had an aquic moisture regime. A portion of the soils were still covered with up to three feet of snow on May 6, the time of the wetland delineation.

7.0 Literature Cited

Kartesz, J.T. 1994a. A synonymized checklist of the vascular flora of the United States, Canada, and Greenland. Vol. 1 – Checklist. Second Edition. Timber Press, Inc. Portland, OR. 622p.

Kartesz, J.T. 1994a. A synonymized checklist of the vascular flora of the United States, Canada, and Greenland. Vol. 2 – Thesaurus. Second Edition. Timber Press, Inc. Portland, OR. 816p.

Reed, P.R. Jr. 1988. National list of plant species that occur in wetlands: Colorado. U.S.D.A. Fish and Wildlife Service. St. Petersburg, FL.

Soil Conservation Service. 1980. Soil Survey of Summit County Area, Colorado. U.S. Department of Agriculture, U.S. Government Printing Office, Washington, D.C.

U.S. Army Corps of Engineers. 1987. Wetlands Delineation Manual, Technical report Y-87-1. U.S. Army Engineer Waterways Experiment Station, Vicksburg, MS

Appendix A

Data Forms

ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: <u>Shirley Ranch</u>	Date: <u>May 5</u>
Applicant/Owner: _____	County: <u>Summit Co.</u>
Investigator: <u>David Meisen - Dave Rucker</u>	State: <u>CO</u>
Do Normal Circumstances exist on the site? * <input checked="" type="radio"/> Yes <input type="radio"/> No	Community ID: _____
Is the site significantly disturbed (Atypical Situation)? <input type="radio"/> Yes <input checked="" type="radio"/> No	Transect ID: _____
Is the area a potential Problem Area? <input type="radio"/> Yes <input checked="" type="radio"/> No	Plot ID: <u>1</u>
(If needed, explain on reverse.)	

* Area influenced by overland irrigation.

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <u>Perovnia imbricata</u>	<u>5-10'</u>	<u>NL</u>	9. _____	_____	_____
2. <u>Panicum polyanthum</u>	<u>20%</u>	<u>FAC W</u>	10. _____	_____	_____
3. _____	_____	_____	11. _____	_____	_____
4. _____	_____	_____	12. _____	_____	_____
5. _____	_____	_____	13. _____	_____	_____
6. _____	_____	_____	14. _____	_____	_____
7. _____	_____	_____	15. _____	_____	_____
8. _____	_____	_____	16. _____	_____	_____

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 0%

Remarks: Located near road (S) at crest of terrace, below a millrace stand that looks to be old stream or drainage but road interrupted natural hydrology.

HYDROLOGY

<p>___ Recorded Data (Describe in Remarks):</p> <p>___ Stream, Lake, or Tide Gauge</p> <p>___ Aerial Photographs</p> <p>___ Other</p> <p>___ No Recorded Data Available</p>	<p>Wetland Hydrology Indicators:</p> <p>Primary Indicators:</p> <p>___ Inundated</p> <p>___ Saturated in Upper 12 Inches</p> <p>___ Water Marks</p> <p>___ Drift Lines</p> <p>___ Sediment Deposits</p> <p>___ Drainage Patterns in Wetlands</p> <p>Secondary Indicators (2 or more required):</p> <p><input checked="" type="checkbox"/> Oxidized Root Channels in Upper 12 Inches</p> <p>___ Water-Stained Leaves</p> <p><input checked="" type="checkbox"/> Local Soil Survey Data</p> <p>___ FAC-Neutral Test</p> <p><input checked="" type="checkbox"/> Other (Explain in Remarks) <u>moths</u></p>
<p>Field Observations:</p> <p>Depth of Surface Water: _____ (in.)</p> <p>Depth to Free Water in Pit: _____ (in.)</p> <p>Depth to Saturated Soil: _____ (in.)</p>	

Remarks: Road ditch on north side of south road is used as irrigation ditch. Other side of road has brown stone and natural drainage. Hill slopes some, within irrigated pasture.

5/5/97

SOILS

Map Unit Name: _____ (Series and Phase): _____ Drainage Class: mod.
 Taxonomy (Subgroup): Typic Cryaquolls Field Observations: well
 Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-7	A1	10YR 2/1	—	—	L, 2 m ep
7-11	A2	10YR 2/1	7.5YR 4/6	c, 2, d	L, 2 m sbk
11-13	2C	5Y 4/1	7.5YR 4/6	c, 2, d	cbt ch, 1 massive

Hydric Soil Indicators:

<input type="checkbox"/> Histosol	<input type="checkbox"/> Concretions
<input type="checkbox"/> Histic Epipedon	<input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils
<input type="checkbox"/> Sulfidic Odor	<input type="checkbox"/> Organic Streaking in Sandy Soils
<input checked="" type="checkbox"/> Aquic Moisture Regime	<input type="checkbox"/> Listed on Local Hydric Soils List
<input type="checkbox"/> Reducing Conditions	<input type="checkbox"/> Listed on National Hydric Soils List
<input checked="" type="checkbox"/> Gleyed or Low-Chroma Colors	<input type="checkbox"/> Other (Explain in Remarks)

Remarks: oxidized root channels in A2, Mn oxide in C horizon. On 3-4% slope so mottles may be due to years of irrigation, since runoff is medium.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes <input checked="" type="checkbox"/> No (Circle)	(Circle)
Wetland Hydrology Present?	Yes <input checked="" type="checkbox"/> No	
Hydric Soils Present?	<input checked="" type="checkbox"/> Yes No	
Is this Sampling Point Within a Wetland?		Yes <input checked="" type="checkbox"/> No

Remarks: The presence of mottles are probably the result of years of irrigation.

DATA FORM
ROUTINE WETLAND DETERMINATION
 (1987 COE Wetlands Delineation Manual).

Project/Site: <u>Shirley Ranch</u> Applicant/Owner: _____ Investigator: _____	Date: <u>5 May</u> County: <u>Summit</u> State: <u>CO</u>
Do Normal Circumstances exist on the site? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Is the site significantly disturbed (Atypical Situation)? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Is the area a potential Problem Area? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> (If needed, explain on reverse.)	Community ID: _____ Transect ID: _____ Plot ID: <u>2</u>

* Area influenced by overland irrigation.

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <u>Bromus inermis</u>	<u>40</u>	<u>NL</u>	9. _____	_____	_____
2. <u>Phleum pratense</u>	<u>50</u>	<u>FAC W</u>	10. _____	_____	_____
3. <u>Salix</u>	<u>30%</u>	<u>Overstory</u>	11. _____	_____	_____
4. <u>Timothy</u>	<u>10</u>	<u>FAC W</u>	12. _____	_____	_____
5. _____	_____	_____	13. _____	_____	_____
6. _____	_____	_____	14. _____	_____	_____
7. _____	_____	_____	15. _____	_____	_____
8. _____	_____	_____	16. _____	_____	_____

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 10%

Remarks: Only hydrophyte, just downhill from pit #1

HYDROLOGY

___ Recorded Data (Describe in Remarks): ___ Stream, Lake, or Tide Gauge ___ Aerial Photographs ___ Other ___ No Recorded Data Available	Wetland Hydrology Indicators: Primary Indicators: ___ Inundated <input checked="" type="checkbox"/> Saturated in Upper 12 Inches ___ Water Marks ___ Drift Lines ___ Sediment Deposits <input checked="" type="checkbox"/> Drainage Patterns in Wetlands * see below
Field Observations: Depth of Surface Water: _____ (in.) Depth to Free Water in Pit: _____ (in.) Depth to Saturated Soil: <u>9</u> (in.)	Secondary Indicators (2 or more required): <input checked="" type="checkbox"/> Oxidized Root Channels in Upper 12 Inches ___ Water-Stained Leaves <input checked="" type="checkbox"/> Local Soil Survey Data ___ FAC-Neutral Test ___ Other (Explain in Remarks)
Remarks: <u>receives runoff water from natural and irrigation. Willows from before road now built, resembles small natural stream drainage.</u>	

5/5/97

SOILS

Somewhat

Map Unit Name (Series and Phase): MU 4 - Cumulic - Craggville Drainage Class: poorly
 Field Observations: _____ Confirm Mapped Type? Yes No

Taxonomy (Subgroup): Cumulic Craggville

Profile Description:					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, - Structure, etc.
0-6	A1	10YR 2/1	—	—	cl, 2 f on
6-12	A2	10YR 2/1	7.5YR 4/6	cl, 2 d	cl 2 m s&k

Hydric Soil Indicators:

<input type="checkbox"/> Histosol	<input type="checkbox"/> Concretions
<input type="checkbox"/> Histic Epipedon	<input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils
<input type="checkbox"/> Sulfidic Odor	<input type="checkbox"/> Organic Stroaking in Sandy Soils
<input checked="" type="checkbox"/> Aquic Moisture Regima	<input checked="" type="checkbox"/> Listed on Local Hydric Soils List
<input type="checkbox"/> Reducing Conditions	<input checked="" type="checkbox"/> Listed on National Hydric Soils List
<input checked="" type="checkbox"/> Gleyed or Low-Chroma Colors	<input type="checkbox"/> Other (Explain in Remarks)

Remarks: Soil is saturated below 9". Oxidized root channels in A2, Next to natural drainage.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> (Circle)	(Circle)
Wetland Hydrology Present?	<input checked="" type="checkbox"/> Yes No <input type="checkbox"/>	
Hydric Soils Present?	<input checked="" type="checkbox"/> Yes No <input type="checkbox"/>	
Is this Sampling Point Within a Wetland?		Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>

Remarks:

ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: <u>Shirley Ranch</u>	Date: <u>5 May 97</u>
Applicant/Owner: _____	County: <u>Summit Co</u>
Investigator: _____	State: <u>CO</u>
Do Normal Circumstances exist on the site? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Community ID: _____
Is the site significantly disturbed (Atypical Situation)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Transect ID: _____
Is the area a potential Problem Area? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Plot ID: <u>3</u>
(If needed, explain on reverse.)	

* Area influenced by overland irrigation.

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <u>Tritic missouriensis</u>	<u>5</u>	<u>OBL</u>	9. _____		
2. <u>Pentstemon floribundus</u>	<u>LO</u>	<u>FACW*</u>	10. _____		
3. <u>Phlox protense</u>	<u>30</u>	<u>FACU</u>	11. _____		
4. <u>Rumex crispus</u>	<u>5</u>	<u>FACW</u>	12. _____		
5. _____			13. _____		
6. _____			14. _____		
7. _____			15. _____		
8. _____			16. _____		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 70%

Remarks: Soils are hydric.

HYDROLOGY

<p>Recorded Data (Describe in Remarks):</p> <p><input type="checkbox"/> Stream, Lake, or Tide Gauge</p> <p><input type="checkbox"/> Aerial Photographs</p> <p><input type="checkbox"/> Other</p> <p><input type="checkbox"/> No Recorded Data Available</p>	<p>Wetland Hydrology Indicators:</p> <p>Primary Indicators:</p> <p><input type="checkbox"/> Inundated</p> <p><input checked="" type="checkbox"/> Saturated in Upper 12 Inches</p> <p><input type="checkbox"/> Water Marks</p> <p><input type="checkbox"/> Drift Lines</p> <p><input type="checkbox"/> Sediment Deposits</p> <p><input checked="" type="checkbox"/> Drainage Patterns in Wetlands</p> <p>Secondary Indicators (2 or more required):</p> <p><input checked="" type="checkbox"/> Oxidized Root Channels in Upper 12 Inches</p> <p><input type="checkbox"/> Water-Stained Leaves</p> <p><input checked="" type="checkbox"/> Local Soil Survey Data</p> <p><input type="checkbox"/> FAC-Neutral Test</p> <p><input type="checkbox"/> Other (Explain in Remarks)</p>
<p>Field Observations:</p> <p>Depth of Surface Water: _____ (in.)</p> <p>Depth to Free Water in Pit: _____ (in.)</p> <p>Depth to Saturated Soil: <u>10</u> (in.)</p>	
<p>Remarks: <u>Part of old stream drainage, water standing and flowing in places. Willows act as snow fence and collect snow, located in depression.</u></p>	

5/5/97

SOILS

Map Unit Name (Series and Phase): _____ Drainage Class: poorly
 Field Observations _____
 Taxonomy (Subgroup): Tuface Chromic Confirm Mapped Type? Yes No

Profile Description:					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-6	A1	10YR 2/1	—	—	L, 2 f gr
6-10	A2	10YR 2/1	7.5YR 4/6	c, 2, d	L, 2 f sbk
10-13	C2	10YR 4/2	10YR 5/6 7.5YR 4/4	m, 2-3, d	grl scl, massive

Hydric Soil Indicators:

<input type="checkbox"/> Histosol	<input type="checkbox"/> Concretions
<input type="checkbox"/> Histic Epipedon	<input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils
<input type="checkbox"/> Sulfidic Odor	<input type="checkbox"/> Organic Streaking in Sandy Soils
<input checked="" type="checkbox"/> Aquic Moisture Regime	<input type="checkbox"/> Listed on Local Hydric Soils List
<input type="checkbox"/> Reducing Conditions	<input type="checkbox"/> Listed on National Hydric Soils List
<input checked="" type="checkbox"/> Gleyed or <u>Low-Chroma</u> Colors	<input type="checkbox"/> Other (Explain in Remarks)

Remarks: Near creek bottom of small stream along S side of survey area. Oxidized root channels in 2C horizon. Saturated below 10".

WETLAND DETERMINATION

Hydrophytic Vegetation Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No (Circle)	(Circle) Is this Sampling Point Within a Wetland? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Wetland Hydrology Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Hydric Soils Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Remarks:	

DATA FORM
 ROUTINE WETLAND DETERMINATION
 (1987 COE Wetlands Delineation Manual)

Project/Site: <u>Shirley Ranch</u> Applicant/Owner: _____ Investigator: _____	Date: <u>5 May 97</u> County: <u>Summit</u> State: <u>CO</u>
Do Normal Circumstances exist on the site? * <input checked="" type="radio"/> Yes <input type="radio"/> No Is the site significantly disturbed (Atypical Situation)? <input type="radio"/> Yes <input checked="" type="radio"/> No Is the area a potential Problem Area? <input type="radio"/> Yes <input checked="" type="radio"/> No (If needed, explain on reverse.)	Community ID: _____ Transect ID: _____ Plot ID: <u>4</u>

* Area influenced by overland irrigation

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <u>Triticum missouriense</u>	<u>10</u>	<u>OBL</u>	9. _____	_____	_____
2. <u>Bromus inermis</u>	<u>30</u>	<u>NL</u>	10. _____	_____	_____
3. <u>Rumex crispus</u>	<u>10</u>	<u>FACW</u>	11. _____	_____	_____
4. <u>Polygonum protense</u>	<u>40</u>	<u>FACU</u>	12. _____	_____	_____
5. <u>Taraxacum officinale</u>	<u>10</u>	<u>FACU</u>	13. _____	_____	_____
6. _____	_____	_____	14. _____	_____	_____
7. _____	_____	_____	15. _____	_____	_____
8. _____	_____	_____	16. _____	_____	_____

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 30%

Remarks: at powerline crossings, wetlands appear to have been impacted. Pile of dead willows and wetland contents very abrupt. Site indicated topsoil has been removed in this area. Collected on surface.

HYDROLOGY

<p>Recorded Data (Describe in Remarks):</p> <p><input type="checkbox"/> Stream, Lake, or Tide Gauge</p> <p><input type="checkbox"/> Aerial Photographs</p> <p><input type="checkbox"/> Other</p> <p><input type="checkbox"/> No Recorded Data Available</p> <hr/> <p>Field Observations:</p> <p>Depth of Surface Water: _____ (in.)</p> <p>Depth to Free Water in Pit: _____ (in.)</p> <p>Depth to Saturated Soil: <u>not</u> (in.)</p>	<p>Wetland Hydrology Indicators:</p> <p>Primary Indicators:</p> <p><input type="checkbox"/> Inundated</p> <p><input type="checkbox"/> Saturated in Upper 12 Inches</p> <p><input type="checkbox"/> Water Marks</p> <p><input type="checkbox"/> Drift Lines</p> <p><input type="checkbox"/> Sediment Deposits</p> <p><input checked="" type="checkbox"/> Drainage Patterns in Wetlands</p> <p>Secondary Indicators (2 or more required):</p> <p><input type="checkbox"/> Oxidized Root Channels in Upper 12 Inches</p> <p><input type="checkbox"/> Water-Stained Leaves</p> <p><input type="checkbox"/> Local Soil Survey Data</p> <p><input type="checkbox"/> FAC-Neutral Test</p> <p><input type="checkbox"/> Other (Explain in Remarks)</p>
<p>Remarks: In old drainage, but at margin, however disturbed when powerline installed resulted in some removal of willows and wetland material. Possibly receives some runoff from irrigation.</p>	

4

5/5/97

SOILS

Map Unit Name: _____ Drainage Class: mod well
 (Series and Phase): _____ Field Observations
 Taxonomy (Subgroup): Typic Cruaqualls Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, - Structure, etc.
0-3	A	7.5YR 3/2	—	—	SL, 2 mgr
3-10	Bw	7.5YR 3/2	7.5YR 4/4 7.5YR 5/6	f, 2, d	v grl SL, 2 m sbr

Hydric Soil Indicators:

<input type="checkbox"/> Histosol	<input type="checkbox"/> Concretions
<input type="checkbox"/> Histic Epipedon	<input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils
<input type="checkbox"/> Sulfidic Odor	<input type="checkbox"/> Organic Streaking in Sandy Soils
<input checked="" type="checkbox"/> Aquic Moisture Regime	<input type="checkbox"/> Listed on Local Hydric Soils List
<input type="checkbox"/> Reducing Conditions	<input type="checkbox"/> Listed on National Hydric Soils List
<input type="checkbox"/> Gleyed or Low-Chroma Colors	<input type="checkbox"/> Other (Explain in Remarks)

Remarks: In disturbed area along small stream in S. side of survey area. The original surface has been removed along overhead power lines. Mottles occur below 7". Was probably wetland before disturbance.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes <input checked="" type="radio"/> No <input type="radio"/> (Circle)	Is this Sampling Point Within a Wetland? <input checked="" type="radio"/> Yes <input type="radio"/> No (Circle)
Wetland Hydrology Present? <input checked="" type="radio"/> Yes <input type="radio"/> No	
Hydric Soils Present? <input checked="" type="radio"/> Yes <input type="radio"/> No	

Remarks: Disturbed area. Was most likely wetland before the recent disturbance.

DATA FORM
 ROUTINE WETLAND DETERMINATION
 (1987 COE Wetlands Delineation Manual)

Project/Site: <u>Shirley Ranch</u> Applicant/Owner: _____ Investigator: _____	Date: <u>5 May 97</u> County: <u>Summit</u> State: <u>CO</u>
Do Normal Circumstances exist on the site? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Is the site significantly disturbed (Atypical Situation)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is the area a potential Problem Area? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No (If needed, explain on reverse.)	Community ID: _____ Transect ID: _____ Plot ID: <u>5</u>

* Area influenced by irrigation practices.

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <u>Bromus inermis</u>	<u>110</u>	<u>ML</u>	9. _____	_____	_____
2. <u>Phlox subulata</u>	<u>30</u>	<u>FACU</u>	10. _____	_____	_____
3. <u>Taraxacum officinale</u>	<u>10</u>	<u>FACU</u>	11. _____	_____	_____
4. <u>Poa pratensis</u>	<u>20</u>	<u>FACU</u>	12. _____	_____	_____
5. _____	_____	_____	13. _____	_____	_____
6. _____	_____	_____	14. _____	_____	_____
7. _____	_____	_____	15. _____	_____	_____
8. _____	_____	_____	16. _____	_____	_____

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 0%

Remarks: Between old drainage and what appears as new drainage channel, below powerline disturbance. This area is cut for hay.

HYDROLOGY

<p>Recorded Data (Describe in Remarks):</p> <input type="checkbox"/> Stream, Lake, or Tide Gauge <input type="checkbox"/> Aerial Photographs <input type="checkbox"/> Other <input type="checkbox"/> No Recorded Data Available	<p>Wetland Hydrology Indicators:</p> <p>Primary Indicators:</p> <input type="checkbox"/> Inundated <input type="checkbox"/> Saturated in Upper 12 Inches <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands
<p>Field Observations:</p> <p>Depth of Surface Water: _____ (in.)</p> <p>Depth to Free Water in Pit: _____ (in.)</p> <p>Depth to Saturated Soil: _____ (in.)</p>	<p>Secondary Indicators (2 or more required):</p> <input checked="" type="checkbox"/> Oxidized Root Channels in Upper 12 Inches <input type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks)
<p>Remarks: <u>Irrigation ditch all the way around this sample area.</u></p>	

5/5/97

SOILS

Map Unit Name (Series and Phase): M.U. 4 - Cumulic Ceraqualls Drainage Class: Somewhat poorly
 Taxonomy (Subgroup): Cumulic Ceraqualls Field Observations: Confirm Mapped Type? Yes No

Profile Description:		Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, - Structure, etc.
Depth (inches)	Horizon				
0-6	A1	10YR 2/1	—	—	L, 2 m ga
6-12	A2	10YR 2/1	7.5YR 4/6	m, 2-3, d	cl, 1 m 56A

Hydric Soil Indicators:

<input type="checkbox"/> Histosol	<input type="checkbox"/> Concretions
<input type="checkbox"/> Histic Epipedon	<input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils
<input type="checkbox"/> Sulfidic Odor	<input type="checkbox"/> Organic Streaking in Sandy Soils
<input checked="" type="checkbox"/> Aquic Moisture Regime	<input checked="" type="checkbox"/> Listed on Local Hydric Soils List
<input type="checkbox"/> Reducing Conditions	<input type="checkbox"/> Listed on National Hydric Soils List
<input checked="" type="checkbox"/> Gleyed or Low-Chroma Colors	<input type="checkbox"/> Other (Explain in Remarks)

Remarks: Oxidized root channels in A2,
 Just down gradient from power pole disturbance,

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes <input checked="" type="radio"/> No (Circle)	Is this Sampling Point Within a Wetland? Yes <input checked="" type="radio"/> No (Circle)
Wetland Hydrology Present?	Yes <input checked="" type="radio"/> No	
Hydric Soils Present?	<input checked="" type="radio"/> Yes No	

Remarks:

ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: <u>Shriber Ranch</u> Applicant/Owner: _____ Investigator: _____	Date: <u>5 May</u> County: <u>Summit</u> State: <u>CO</u>
Do Normal Circumstances exist on the site? Yes <input type="radio"/> No <input checked="" type="radio"/> Is the site significantly disturbed (Atypical Situation)? Yes <input type="radio"/> No <input checked="" type="radio"/> Is the area a potential Problem Area? Yes <input type="radio"/> No <input checked="" type="radio"/> (If needed, explain on reverse.)	Community ID: _____ Transect ID: _____ Plot ID: <u>6</u>

* Area influenced by irrigation.

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <u>Potamogeton nodosus</u>	<u>50%</u>	<u>NL</u>	9. _____	_____	_____
2. <u>Phalaris proserpina</u>	<u>50%</u>	<u>FACU</u>	10. _____	_____	_____
3. _____	_____	_____	11. _____	_____	_____
4. _____	_____	_____	12. _____	_____	_____
5. _____	_____	_____	13. _____	_____	_____
6. _____	_____	_____	14. _____	_____	_____
7. _____	_____	_____	15. _____	_____	_____
8. _____	_____	_____	16. _____	_____	_____

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): _____

Remarks: Hummic type soil surface. Smooth brome moving into grass area. Hydrology has been altered to some extent, water probably ponds around hummies.

HYDROLOGY

<input type="checkbox"/> Recorded Data (Describe in Remarks): <input type="checkbox"/> Stream, Lake, or Tide Gauge <input type="checkbox"/> Aerial Photographs <input type="checkbox"/> Other <input type="checkbox"/> No Recorded Data Available	Wetland Hydrology Indicators: Primary Indicators: <input type="checkbox"/> Inundated <input type="checkbox"/> Saturated in Upper 12 Inches <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input checked="" type="checkbox"/> Drainage Patterns in Wetlands Secondary Indicators (2 or more required): <input checked="" type="checkbox"/> Oxidized Root Channels in Upper 12 Inches <input type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks)
Field Observations: Depth of Surface Water: _____ (in.) Depth to Free Water in Pit: _____ (in.) Depth to Saturated Soil: _____ (in.)	Remarks: <u>Large root material within the soil and signs of a few live willows in the area. Drainage pattern altered by disturbance from powerline and irrigation ditch near road.</u>

5/5/97

SOILS

Map Unit Name (Series and Phase): M.U. 4 - Cumulic Cryaquolls Drainage Class: poorly
 Field Observations: _____ Confirm Mapped Type? Yes No

Taxonomy (Subgroup): Cumulic Cryaquolls

Profile Description:		Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, - Structure, etc.
Depth (inches)	Horizon				
0-7	A1	10YR 2/1	—	—	L, 2 m or
7-13	A2	10YR 2/1	7.5YR 4/6 10YR 5/6	C, 2, d	cl, 2 C platy

Hydric Soil Indicators:

<input type="checkbox"/> Histosol	<input type="checkbox"/> Concretions
<input type="checkbox"/> Histic Epipedon	<input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils
<input type="checkbox"/> Sulfidic Odor	<input type="checkbox"/> Organic Streaking in Sandy Soils
<input checked="" type="checkbox"/> Aquic Moisture Regime	<input checked="" type="checkbox"/> Listed on Local Hydric Soils List
<input type="checkbox"/> Reducing Conditions	<input type="checkbox"/> Listed on National Hydric Soils List
<input checked="" type="checkbox"/> Gleyed or <u>Low-Chroma</u> Colors	<input type="checkbox"/> Other (Explain in Remarks)

Remarks: In former drainageway before the power pole disturbance, Hummocky surface. Many woody roots, Was probably a wetland before stream course was altered, oxidized root channels in A2.

Saturated conditions on top of plates in A2 horizon.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> (Circle)	(Circle)
Wetland Hydrology Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Is this Sampling Point Within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Hydric Soils Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	

Remarks: In disturbed area. Disturbance is recent + area was wetland before disturbance.

ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: <u>Shiloh Ranch</u> Applicant/Owner: _____ Investigator: _____	Date: <u>5 May 97</u> County: <u>Summit</u> State: <u>CO</u>
Do Normal Circumstances exist on the site? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Is the site significantly disturbed (Atypical Situation)? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Is the area a potential Problem Area? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> (If needed, explain on reverse.)	Community ID: _____ Transect ID: _____ Plot ID: <u>7</u>

Area appears to be the end of a ditch stream channel as in

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <u>Carex utriculata</u>	<u>S5</u>	<u>OBL</u>	9. _____	_____	_____
2. <u>Juncus balticus</u>	<u>15</u>	<u>FACW</u>	10. _____	_____	_____
3. _____	_____	_____	11. _____	_____	_____
4. <u>Salix amygdaloides</u>	<u>20%</u>	_____	12. _____	_____	_____
5. _____	_____	_____	13. _____	_____	_____
6. _____	_____	_____	14. _____	_____	_____
7. _____	_____	_____	15. _____	_____	_____
8. _____	_____	_____	16. _____	_____	_____

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 100%

Remarks: None found north of snow fence

Saturation on top of soil plates.

HYDROLOGY

<p>Recorded Data (Describe in Remarks):</p> <p><input type="checkbox"/> Stream, Lake, or Tide Gauge</p> <p><input type="checkbox"/> Aerial Photographs</p> <p><input type="checkbox"/> Other</p> <p><input type="checkbox"/> No Recorded Data Available</p> <hr/> <p>Field Observations:</p> <p>Depth of Surface Water: _____ (in.)</p> <p>Depth to Free Water in Pit: _____ (in.)</p> <p>Depth to Saturated Soil: <input checked="" type="checkbox"/> <u>7</u> ^{SEE} _{ATTACHED} (in.)</p>	<p>Wetland Hydrology Indicators:</p> <p>Primary Indicators:</p> <p><input type="checkbox"/> Inundated</p> <p><input type="checkbox"/> Saturated in Upper 12 Inches</p> <p><input type="checkbox"/> Water Marks</p> <p><input type="checkbox"/> Drift Lines</p> <p><input type="checkbox"/> Sediment Deposits</p> <p><input checked="" type="checkbox"/> Drainage Patterns in Wetlands</p> <p>Secondary Indicators (2 or more required):</p> <p><input checked="" type="checkbox"/> Oxidized Root Channels in Upper 12 Inches</p> <p><input type="checkbox"/> Water-Stained Leaves</p> <p><input type="checkbox"/> Local Soil Survey Data</p> <p><input type="checkbox"/> FAC-Neutral Test</p> <p><input type="checkbox"/> Other (Explain in Remarks)</p>
<p>Remarks: <u>Natural drainage is interrupted downstream by irrigation ditch. The rest of the area to north is cut, and has mainly prairie grasses. Signs of old meandering stream. Channel can not be seen below (downslope) of sample area.</u></p>	

5/5/97

SOILS

Map Unit Name (Series and Phase): M.U. 4- Camatic Craguolls Drainage Class: poorly
 Field Observations
 Taxonomy (Subgroup): Camatic Craguolls Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-17	A1	10YR 2/1	—	—	L, 2 mgs
7-12	A2	10YR 2/1	7.5YR 4/6	C, 2, 1	cl, 2 c platy

Hydric Soil Indicators:

- Histosol
- Histic Epipedon
- Sulfidic Odor
- Aquic Moisture Regime
- Reducing Conditions
- Gleyed or LOW CHROMA Colors
- Concretions
- High Organic Content in Surface Layer in Sandy Soils
- Organic Streaking in Sandy Soils
- Listed on Local Hydric Soils List
- Listed on National Hydric Soils List
- Other (Explain in Remarks)

Remarks: In drainage channel, SE side of Survey area. Oxidized root channels in A2. Saturated conditions on top of plates in A2 horizon. Hummocky area

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	<input checked="" type="radio"/> Yes <input type="radio"/> No (Circle)	(Circle) Is this Sampling Point Within a Wetland? <input checked="" type="radio"/> Yes <input type="radio"/> No
Wetland Hydrology Present?	<input checked="" type="radio"/> Yes <input type="radio"/> No	
Hydric Soils Present?	<input checked="" type="radio"/> Yes <input type="radio"/> No	

Remarks:

ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: <u>Shirley Ranch</u>	Date: <u>5 May 97</u>
Applicant/Owner: _____	County: <u>Summit</u>
Investigator: _____	State: <u>CO</u>
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation)? Is the area a potential Problem Area? (If needed, explain on reverse.)	<input checked="" type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Yes <input checked="" type="radio"/> No <input type="radio"/> Yes <input checked="" type="radio"/> No
	Community ID: _____ Transect ID: _____ Plot ID: <u>8</u>

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <u>Tumulus botulicus</u>	<u>90</u>	<u>FACW</u>	9. _____	_____	_____
2. <u>Poa pratensis</u>	<u>10</u>	<u>FACU</u>	10. _____	_____	_____
3. _____	_____	_____	11. _____	_____	_____
4. _____	_____	_____	12. _____	_____	_____
5. _____	_____	_____	13. _____	_____	_____
6. _____	_____	_____	14. _____	_____	_____
7. _____	_____	_____	15. _____	_____	_____
8. _____	_____	_____	16. _____	_____	_____

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 90%

Remarks: Soil well drained, not hydric.

HYDROLOGY

<input type="checkbox"/> Recorded Data (Describe in Remarks): <input type="checkbox"/> Stream, Lake, or Tide Gauge <input type="checkbox"/> Aerial Photographs <input type="checkbox"/> Other <input type="checkbox"/> No Recorded Data Available	Wetland Hydrology Indicators: Primary Indicators: <input type="checkbox"/> Inundated <input type="checkbox"/> Saturated in Upper 12 Inches <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands Secondary Indicators (2 or more required): <input type="checkbox"/> Oxidized Root Channels in Upper 12 Inches <input type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks)
Field Observations: Depth of Surface Water: _____ (in.) Depth to Free Water in Pit: _____ (in.) Depth to Saturated Soil: _____ (in.)	
Remarks: <u>No signs of hydrology indicators.</u>	

Map Unit Name
(Series and Phase):

Handran gel loam 0-3%

Drainage Class: well

Field Observations

Taxonomy (Subgroup):

Typic: Chromoborolls

Confirm Mapped Type?

Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-3	A	7.5YR 3/2	—	—	SL, 2 f gr
3-10	C	7.5YR 3/2	—	—	V gr SL massive

Hydric Soil Indicators:

- | | |
|--|---|
| <input type="checkbox"/> Histosol | <input type="checkbox"/> Concretions |
| <input type="checkbox"/> Histic Epipedon | <input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils |
| <input type="checkbox"/> Sulfidic Odor | <input type="checkbox"/> Organic Streaking in Sandy Soils |
| <input type="checkbox"/> Aquic Moisture Regime | <input type="checkbox"/> Listed on Local Hydric Soils List |
| <input type="checkbox"/> Reducing Conditions | <input type="checkbox"/> Listed on National Hydric Soils List |
| <input type="checkbox"/> Gleyed or Low-Chroma Colors | <input type="checkbox"/> Other (Explain in Remarks) |

Remarks: on mid-river terrace. Well drained soil - very gravelly,

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	<input checked="" type="radio"/> Yes <input type="radio"/> No (Circle)	Is this Sampling Point Within a Wetland?	(Circle)
Wetland Hydrology Present?	Yes <input checked="" type="radio"/> No		Yes <input checked="" type="radio"/> No
Hydric Soils Present?	Yes <input checked="" type="radio"/> No		
Remarks:			

ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: <u>Shirley Ranch</u> Applicant/Owner: _____ Investigator: _____	Date: <u>5 May 77</u> County: <u>Summit</u> State: <u>CO</u>
Do Normal Circumstances exist on the site? <input checked="" type="radio"/> Yes <input type="radio"/> No Is the site significantly disturbed (Atypical Situation)? <input type="radio"/> Yes <input checked="" type="radio"/> No Is the area a potential Problem Area? <input type="radio"/> Yes <input checked="" type="radio"/> No (If needed, explain on reverse.)	Community ID: _____ Transect ID: _____ Plot ID: <u>9</u>

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <u>Phleum pratense</u>	<u>90</u>	<u>FACU</u>	9. _____		
2. <u>Taraxacum officinale</u>	<u>10</u>	<u>FACU</u>	10. _____		
3. _____			11. _____		
4. _____			12. _____		
5. _____			13. _____		
6. _____			14. _____		
7. _____			15. _____		
8. _____			16. _____		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 0%

Remarks: Soils Not Hydric

HYDROLOGY

<input type="checkbox"/> Recorded Data (Describe in Remarks): <input type="checkbox"/> Stream, Lake, or Tide Gauge <input type="checkbox"/> Aerial Photographs <input type="checkbox"/> Other <input type="checkbox"/> No Recorded Data Available	Wetland Hydrology Indicators: Primary Indicators: <input type="checkbox"/> Inundated <input type="checkbox"/> Saturated in Upper 12 Inches <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands Secondary Indicators (2 or more required): <input type="checkbox"/> Oxidized Root Channels in Upper 12 Inches <input type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks)
Field Observations: Depth of Surface Water: _____ (in.) Depth to Free Water in Pit: _____ (in.) Depth to Saturated Soil: _____ (in.)	
Remarks: <u>No wetland hydrology indicators.</u>	

Map Unit Name
(Series and Phase):

Handran gal loam

Drainage Class: Well

Field Observations

Taxonomy (Subgroup):

Typic Concolorals

Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, - Structure, etc.
0-6	A	7.5YR 3/2	—	—	g-l SL, 2 f gr
6-10	C	7.5YR 3/2	—	—	v-g-l SL, massive

Hydric Soil Indicators:

- | | |
|--|---|
| <input type="checkbox"/> Histosol | <input type="checkbox"/> Concretions |
| <input type="checkbox"/> Histic Epipedon | <input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils |
| <input type="checkbox"/> Sulfidic Odor | <input type="checkbox"/> Organic Streaking in Sandy Soils |
| <input type="checkbox"/> Aquic Moisture Regime | <input type="checkbox"/> Listed on Local Hydric Soils List |
| <input type="checkbox"/> Reducing Conditions | <input type="checkbox"/> Listed on National Hydric Soils List |
| <input type="checkbox"/> Gleyed or Low-Chroma Colors | <input type="checkbox"/> Other (Explain in Remarks) |

Remarks:

on mid-river terrace, well drained soils - very gravelly
but is abandoned.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes No (Circle)

Wetland Hydrology Present? Yes No

Hydric Soils Present? Yes No

Is this Sampling Point Within a Wetland? Yes No

Remarks:

ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: <u>Shirley Ranch</u>	Date: <u>5 May</u>
Applicant/Owner: _____	County: <u>Summit</u>
Investigator: _____	State: <u>CO</u>
Do Normal Circumstances exist on the site? <input checked="" type="radio"/> Yes <input type="radio"/> No	Community ID: _____ Transect ID: _____ Plot ID: <u>10</u>
Is the site significantly disturbed (Atypical Situation)? <input type="radio"/> Yes <input checked="" type="radio"/> No	
Is the area a potential Problem Area? <input type="radio"/> Yes <input checked="" type="radio"/> No (If needed, explain on reverse.)	

Area affected by overland irrigation.
Can't tell if wetland is only from irrigation.

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <u>Carex rostrata</u>	<u>90%</u>	<u>OBL</u>	9. _____	_____	_____
2. <u>Poa pratensis</u>	<u>5%</u>	<u>FACU</u>	10. _____	_____	_____
3. <u>Taraxacum officinale</u>	<u>5%</u>	<u>FKU</u>	11. _____	_____	_____
4. _____	_____	_____	12. _____	_____	_____
5. _____	_____	_____	13. _____	_____	_____
6. _____	_____	_____	14. _____	_____	_____
7. _____	_____	_____	15. _____	_____	_____
8. _____	_____	_____	16. _____	_____	_____

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 90%

Remarks: Near center of property by Hwy 9.
East of highway there is signs that a channel may have existed once.

HYDROLOGY

<p>___ Recorded Data (Describe in Remarks):</p> <p>___ Stream, Lake, or Tide Gauge</p> <p>___ Aerial Photographs</p> <p>___ Other</p> <p>___ No Recorded Data Available</p> <hr/> <p>Field Observations:</p> <p>Depth of Surface Water: _____ (in.)</p> <p>Depth to Free Water in Pit: _____ (in.)</p> <p>Depth to Saturated Soil: _____ (in.)</p>	<p>Wetland Hydrology Indicators:</p> <p>Primary Indicators:</p> <p>___ Inundated</p> <p><input checked="" type="checkbox"/> Saturated in Upper 12 Inches</p> <p>___ Water Marks</p> <p>___ Drift Lines</p> <p>___ Sediment Deposits</p> <p><input checked="" type="checkbox"/> Drainage Patterns in Wetlands</p> <p>Secondary Indicators (2 or more required):</p> <p>___ Oxidized Root Channels in Upper 12 Inches</p> <p>___ Water-Stained Leaves</p> <p>___ Local Soil Survey Data</p> <p>___ FAC-Neutral Test</p> <p>___ Other (Explain in Remarks)</p>
<p>Remarks: <u>Probably where old drainage channel from up above flowed. Water is seeping from bank to the west.</u></p>	

Map Unit Name
(Series and Phase): _____

Drainage Class: somewhat
poorly
Field Observations
Confirm Mapped Type? Yes No

Taxonomy (Subgroup): Cumelic - Cryoburalls

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-7	A1	10YR 2/1	—	—	L, 2 m gr
7-12	A2	10YR 2.5/1	7.5YR 4/6	c, 2, d	L, 2 m sbk

Hydric Soil Indicators:

- | | |
|--|---|
| <input type="checkbox"/> Histosol | <input type="checkbox"/> Concretions |
| <input type="checkbox"/> Histic Epipedon | <input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils |
| <input type="checkbox"/> Sulfidic Odor | <input type="checkbox"/> Organic Streaking in Sandy Soils |
| <input checked="" type="checkbox"/> Aquic Moisture Regime | <input type="checkbox"/> Listed on Local Hydric Soils List |
| <input type="checkbox"/> Reducing Conditions | <input type="checkbox"/> Listed on National Hydric Soils List |
| <input checked="" type="checkbox"/> Gleyed or <u>Low-Chroma</u> Colors | <input type="checkbox"/> Other (Explain in Remarks) |

Remarks: Along E. edge of survey area. May be in old drainage channel that has been altered, possibly filled.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? <u>Yes</u> No (Circle)	Is this Sampling Point Within a Wetland? <u>Yes</u> No
Wetland Hydrology Present? <u>Yes</u> No	
Hydric Soils Present? <u>Yes</u> No	
Remarks:	

ROUTINE WETLAND DETERMINATION
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Project/Site: <u>Shirley Ranch</u>	Date: <u>5 May 97</u>
Applicant/Owner: _____	County: <u>Summit</u>
Investigator: _____	State: <u>CO</u>
Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation)? Is the area a potential Problem Area? (If needed, explain on reverse.)	<input checked="" type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Yes <input checked="" type="radio"/> No <input type="radio"/> Yes <input checked="" type="radio"/> No
	Community ID: _____ Transect ID: _____ Plot ID: <u>11</u>

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <u>Iris wisconsinensis</u>	<u>5</u>	<u>OBL</u>	9. _____		
2. <u>Taraxacum officinale</u>	<u>5</u>	<u>FACU</u>	10. _____		
3. <u>Poa pratensis</u>	<u>60</u>	<u>FACU</u>	11. _____		
4. <u>Phlox pratensis</u>	<u>30</u>	<u>FACU</u>	12. _____		
5. _____			13. _____		
6. _____			14. _____		
7. _____			15. _____		
8. _____			16. _____		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 5%

Remarks: Soils are hydric but no oxidized root channels and soils are lighter colored. Willows to north are probably present because vegetation is never cut because of slope.

HYDROLOGY

<input type="checkbox"/> Recorded Data (Describe in Remarks): <input type="checkbox"/> Stream, Lake, or Tide Gauge <input type="checkbox"/> Aerial Photographs <input type="checkbox"/> Other <input type="checkbox"/> No Recorded Data Available	Wetland Hydrology Indicators: Primary Indicators: <input type="checkbox"/> Inundated <input type="checkbox"/> Saturated in Upper 12 Inches <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands Secondary Indicators (2 or more required): <input type="checkbox"/> Oxidized Root Channels in Upper 12 Inches <input type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks)
Field Observations: Depth of Surface Water: _____ (in.) Depth to Free Water in Pit: _____ (in.) Depth to Saturated Soil: _____ (in.)	
Remarks: At soil edge of natural drainage, not wet, even with overland flow from irrigation.	

Map Unit Name
(Series and Phase): _____

Somewhat

Drainage Class: poorly

Field Observations

Taxonomy (Subgroup): Tuface Gypgall

Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, - Structure, etc.
0-7	A1	10YR 2/1	—	—	L, 2 m ga
7-12	A2	10YR 3/2	10YR 4/6	c, 2-3, d	L, 2 m sbk

Hydric Soil Indicators:

- | | |
|---|---|
| <input type="checkbox"/> Histosol | <input type="checkbox"/> Concretions |
| <input type="checkbox"/> Histic Epipedon | <input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils |
| <input type="checkbox"/> Sulfidic Odor | <input type="checkbox"/> Organic Streaking in Sandy Soils |
| <input checked="" type="checkbox"/> Aquic Moisture Regime | <input type="checkbox"/> Listed on Local Hydric Soils List |
| <input type="checkbox"/> Reducing Conditions | <input type="checkbox"/> Listed on National Hydric Soils List |
| <input type="checkbox"/> Gleyed or Low-Chroma Colors | <input type="checkbox"/> Other (Explain in Remarks) |

Remarks: mottles are probably the result of many years of irrigation. On lower (abandoned) river terrace.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes <u>No</u> (Circle)	(Circle)
Wetland Hydrology Present? Yes <u>No</u>	
Hydric Soils Present? <u>Yes</u> No	
Is this Sampling Point Within a Wetland? Yes <u>No</u>	
Remarks:	

ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: <u>Shirley Ranch</u> Applicant/Owner: _____ Investigator: _____	Date: <u>5 May 97</u> County: <u>Summit</u> State: <u>CO</u>
Do Normal Circumstances exist on the site? <input checked="" type="radio"/> Yes <input type="radio"/> No Is the site significantly disturbed (Atypical Situation)? <input type="radio"/> Yes <input checked="" type="radio"/> No Is the area a potential Problem Area? <input type="radio"/> Yes <input checked="" type="radio"/> No (If needed, explain on reverse.)	Community ID: _____ Transect ID: _____ Plot ID: <u>12</u>

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <u>Phleum pratense</u>	<u>75</u>	<u>FACU</u>	9. _____		
2. <u>Poa pratensis</u>	<u>15</u>	<u>FACU</u>	10. _____		
3. _____			11. _____		
4. _____			12. _____		
5. _____			13. _____		
6. _____			14. _____		
7. _____			15. _____		
8. _____			16. _____		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 0%

Remarks: _____

HYDROLOGY

<input type="checkbox"/> Recorded Data (Describe in Remarks): <input type="checkbox"/> Stream, Lake, or Tide Gauge <input type="checkbox"/> Aerial Photographs <input type="checkbox"/> Other <input checked="" type="checkbox"/> No Recorded Data Available	Wetland Hydrology Indicators: Primary Indicators: <input type="checkbox"/> Inundated <input type="checkbox"/> Saturated in Upper 12 Inches <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands Secondary Indicators (2 or more required): <input type="checkbox"/> Oxidized Root Channels in Upper 12 Inches <input type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks)
Field Observations: Depth of Surface Water: _____ (in.) Depth to Free Water in Pit: _____ (in.) Depth to Saturated Soil: _____ (in.)	Remarks: <u>No wetland hydrology indicators. Overland flow from irrigation on soil surface on all sides of sample location.</u>

Map Unit Name

(Series and Phase): Handran grl loam 0-3'

Drainage Class: Well

Field Observations

Taxonomy (Subgroup): L-S Typic Cryoborolls

Confirm Mapped Type? (Yes) No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-5	A	7.5YR 3/2	—	—	SL, 2 m gr
5-11	C	7.5YR 3/2	—	—	Very SL, massive

Hydric Soil Indicators:

- | | |
|--|---|
| <input type="checkbox"/> Histosol | <input type="checkbox"/> Concretions |
| <input type="checkbox"/> Histic Epipedon | <input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils |
| <input type="checkbox"/> Sulfidic Odor | <input type="checkbox"/> Organic Streaking in Sandy Soils |
| <input type="checkbox"/> Aquic Moisture Regime | <input type="checkbox"/> Listed on Local Hydric Soils List |
| <input type="checkbox"/> Reducing Conditions | <input type="checkbox"/> Listed on National Hydric Soils List |
| <input type="checkbox"/> Gleyed or Low-Chroma Colors | <input type="checkbox"/> Other (Explain in Remarks) |

Remarks: On mid-terrace. Well drained soil, very gravelly. Some orange-red sand grains.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes <u>(No)</u> (Circle)	(Circle)
Wetland Hydrology Present?	Yes <u>(No)</u>	
Hydric Soils Present?	Yes <u>(No)</u>	
Is this Sampling Point Within a Wetland?		Yes <u>(No)</u>

Remarks:

ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: <u>Shirley Beach</u>	Date: <u>6 May 97</u>
Applicant/Owner: _____	County: <u>Summit</u>
Investigator: _____	State: <u>CO</u>
Do Normal Circumstances exist on the site? <input checked="" type="radio"/> Yes <input type="radio"/> No	Community ID: _____
Is the site significantly disturbed (Atypical Situation)? <input type="radio"/> Yes <input checked="" type="radio"/> No	Transect ID: _____
Is the area a potential Problem Area? <input type="radio"/> Yes <input checked="" type="radio"/> No	Plot ID: <u>13</u>
(If needed, explain on reverse.)	

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <u>Phlox pilulosa</u>	<u>75</u>	<u>FACU</u>	9. _____	_____	_____
2. <u>Taraxacum officinale</u>	<u>10</u>	<u>FACU</u>	10. _____	_____	_____
3. <u>Poa annua</u>	<u>15</u>	<u>FACU</u>	11. _____	_____	_____
4. _____	_____	_____	12. _____	_____	_____
5. _____	_____	_____	13. _____	_____	_____
6. _____	_____	_____	14. _____	_____	_____
7. _____	_____	_____	15. _____	_____	_____
8. _____	_____	_____	16. _____	_____	_____

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 0%

Remarks: Mottles present below # horizon, Soil to light and are not hydric. Site located at downhill end of willow stand along dike. Willows present along sample location.

HYDROLOGY

<p><input type="checkbox"/> Recorded Data (Describe in Remarks):</p> <p><input type="checkbox"/> Stream, Lake, or Tide Gauge</p> <p><input type="checkbox"/> Aerial Photographs</p> <p><input type="checkbox"/> Other</p> <p><input type="checkbox"/> No Recorded Data Available</p> <hr/> <p>Field Observations:</p> <p>Depth of Surface Water: _____ (in.)</p> <p>Depth to Free Water in Pit: _____ (in.)</p> <p>Depth to Saturated Soil: <u>10</u> (in.)</p>	<p>Wetland Hydrology Indicators:</p> <p>Primary Indicators:</p> <p><input type="checkbox"/> Inundated</p> <p><input checked="" type="checkbox"/> Saturated in Upper 12 Inches</p> <p><input type="checkbox"/> Water Marks</p> <p><input type="checkbox"/> Drift Lines</p> <p><input type="checkbox"/> Sediment Deposits</p> <p><input type="checkbox"/> Drainage Patterns in Wetlands</p> <p>Secondary Indicators (2 or more required):</p> <p><input type="checkbox"/> Oxidized Root Channels in Upper 12 Inches</p> <p><input type="checkbox"/> Water-Stained Leaves</p> <p><input type="checkbox"/> Local Soil Survey Data</p> <p><input type="checkbox"/> FAC-Neutral Test</p> <p><input type="checkbox"/> Other (Explain in Remarks)</p>
<p>Remarks: No Wetland Hydrology Indicators except for saturated soils. Several irrigated ditches along willow stand direct water overland through willows.</p>	

Map Unit Name
(Series and Phase):

Cimarron loam 15-35%

Drainage Class: mod well
Field Observations

mod

well

Taxonomy (Subgroup):

Argic Cryoborolls

Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-9	A	10YR 2/2	—	—	L, 2 mgr
9-13	Bt	10YR 5/4	10YR 5/6 7.5YR 4/6	C, 2, d	Cl, 2 m sbr

Hydric Soil Indicators:

- | | |
|--|---|
| <input type="checkbox"/> Histosol | <input type="checkbox"/> Concretions |
| <input type="checkbox"/> Histic Epipedon | <input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils |
| <input type="checkbox"/> Sulfidic Odor | <input type="checkbox"/> Organic Streaking in Sandy Soils |
| <input type="checkbox"/> Aquic Moisture Regime | <input type="checkbox"/> Listed on Local Hydric Soils List |
| <input type="checkbox"/> Reducing Conditions | <input type="checkbox"/> Listed on National Hydric Soils List |
| <input type="checkbox"/> Gleyed or Low-Chroma Colors | <input type="checkbox"/> Other (Explain in Remarks) |

Remarks: Soil is saturated below 10". Bt horizon contains mottles but chroma is too light.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes <input checked="" type="radio"/> No <input type="radio"/> (Circle)	(Circle)
Wetland Hydrology Present? <input checked="" type="radio"/> Yes <input type="radio"/> No	
Hydric Soils Present? Yes <input checked="" type="radio"/> No <input type="radio"/>	Is this Sampling Point Within a Wetland? Yes <input checked="" type="radio"/> No <input type="radio"/>

Remarks: Site is on a 20% slope & just below irrigation ditch. Saturation & mottles are due to irrigation. Chroma is too light for hydric.

Project/Site: <u>Shirley Ranch</u> Applicant/Owner: _____ Investigator: <u>DEM</u>	Date: <u>6 May</u> County: <u>Suñat</u> State: <u>CO.</u>
Do Normal Circumstances exist on the site? <input checked="" type="radio"/> Yes <input type="radio"/> No Is the site significantly disturbed (Atypical Situation)? <input type="radio"/> Yes <input checked="" type="radio"/> No Is the area a potential Problem Area? <input type="radio"/> Yes <input checked="" type="radio"/> No (If needed, explain on reverse.)	Community ID: _____ Transect ID: _____ Plot ID: <u>14</u>

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <u>Carex intricata</u>	<u>20%</u>	<u>OBL</u>	9. _____	_____	_____
2. <u>Pentstemonis floribunda</u>	<u>10%</u>	<u>FACW*</u>	10. _____	_____	_____
3. <u>Juncus balticus</u>	<u>25%</u>	<u>FACW</u>	11. _____	_____	_____
4. <u>Salix monticola</u>	<u>Operator</u>	_____	12. _____	_____	_____
5. <u>Poa pratensis</u>	<u>10%</u>	<u>FACU</u>	13. _____	_____	_____
6. _____	_____	_____	14. _____	_____	_____
7. _____	_____	_____	15. _____	_____	_____
8. _____	_____	_____	16. _____	_____	_____

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 55%

Remarks: Sample site within a willow stand.
Soils hypoxic.

HYDROLOGY

___ Recorded Data (Describe in Remarks): ___ Stream, Lake, or Tide Gauge ___ Aerial Photographs ___ Other ___ No Recorded Data Available	Wetland Hydrology Indicators: Primary Indicators: ___ Inundated <input checked="" type="checkbox"/> Saturated in Upper 12 Inches ___ Water Marks ___ Drift Lines ___ Sediment Deposits <input checked="" type="checkbox"/> Drainage Patterns in Wetlands <u>see below</u> Secondary Indicators (2 or more required): ___ Oxidized Root Channels in Upper 12 Inches ___ Water-Stained Leaves ___ Local Soil Survey Data ___ FAC-Neutral Test ___ Other (Explain in Remarks)
Field Observations: Depth of Surface Water: _____ (in.) Depth to Free Water in Pit: _____ (in.) Depth to Saturated Soil: <u>8'</u> (in.)	
Remarks: <u>* Area could be a natural seep, however the steep slope would indicate water should drain off naturally, too quickly to produce a wetland.</u> <u>Irrigation ditch along willow stand.</u>	

Map Unit Name _____
(Series and Phase): _____

Drainage Class: mod. well
Field Observations

Taxonomy (Subgroup): Acric Cryaquolls

Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, - Structure, etc.
0-8	A	10YR 2/2	10YR 5/6	f, 2, d	L, 2 fgs
8-12	BE	10YR 4/4	10YR 5/6	c, 2, d	pl CL, 2 m sbr

Hydric Soil Indicators:

- Histosol
- Histic Epipedon
- Sulfidic Odor
- Aquic Moisture Regime
- Reducing Conditions
- Gleyed or Low-Chroma Colors
- Concretions
- High Organic Content in Surface Layer in Sandy Soils
- Organic Streaking in Sandy Soils
- Listed on Local Hydric Soils List
- Listed on National Hydric Soils List
- Other (Explain in Remarks)

Remarks: Lower 2" of the A horizon contains mottles.
In willows on 20% slope. Soil is saturated below 8".

Irrigation ditch is upslope. Willows, soil mottles, + saturation may be due to years of irrigation.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? <input checked="" type="radio"/> Yes <input type="radio"/> No (Circle)	(Circle)
Wetland Hydrology Present? <input checked="" type="radio"/> Yes <input type="radio"/> No	
Hydric Soils Present? <input checked="" type="radio"/> Yes <input type="radio"/> No	Is this Sampling Point Within a Wetland? <input checked="" type="radio"/> Yes <input type="radio"/> No

Remarks:

Project/Site: <u>Stirling Ranch</u> Applicant/Owner: _____ Investigator: _____	Date: <u>6 May</u> County: <u>Summit</u> State: <u>CO</u>
Do Normal Circumstances exist on the site? <input checked="" type="radio"/> Yes <input type="radio"/> No Is the site significantly disturbed (Atypical Situation)? <input type="radio"/> Yes <input checked="" type="radio"/> No Is the area a potential Problem Area? <input type="radio"/> Yes <input checked="" type="radio"/> No (If needed, explain on reverse.)	Community ID: _____ Transect ID: _____ Plot ID: <u>15</u>

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <u>Agrostis alba</u>	<u>10</u>	<u>FACW</u>	9. _____	_____	_____
2. <u>Carex intraculata</u>	<u>10</u>	<u>OBL</u>	10. _____	_____	_____
3. <u>Rhynchos setosum var. varietum</u>	<u>5</u>	<u>OBL</u>	11. _____	_____	_____
4. <u>Rumex crispus</u>	<u>5</u>	<u>FACW</u>	12. _____	_____	_____
5. <u>Poa pratensis</u>	<u>20</u>	<u>FACU</u>	13. _____	_____	_____
6. _____	_____	_____	14. _____	_____	_____
7. _____	_____	_____	15. _____	_____	_____
8. _____	_____	_____	16. _____	_____	_____

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). _____

Remarks: Uphill from sample site is an aspen stand, downhill is a willow stand.
Located at crest of hill about 50 feet downhill of active irrigation ditch.

HYDROLOGY

<p>___ Recorded Data (Describe in Remarks):</p> <p> ___ Stream, Lake, or Tide Gauge</p> <p> ___ Aerial Photographs</p> <p> ___ Other</p> <p>___ No Recorded Data Available</p> <hr/> <p>Field Observations:</p> <p>Depth of Surface Water: _____ (in.)</p> <p>Depth to Free Water in Pit: _____ (in.)</p> <p>Depth to Saturated Soil: <u>7</u> (in.)</p>	<p>Wetland Hydrology Indicators:</p> <p>Primary Indicators:</p> <p> ___ Inundated</p> <p> <input checked="" type="checkbox"/> Saturated in Upper 12 Inches</p> <p> ___ Water Marks</p> <p> ___ Drift Lines</p> <p> ___ Sediment Deposits</p> <p> ___ Drainage Patterns in Wetlands</p> <p>Secondary Indicators (2 or more required):</p> <p> ___ Oxidized Root Channels in Upper 12 Inches</p> <p> ___ Water-Stained Leaves</p> <p> ___ Local Soil Survey Data</p> <p> ___ FAC-Neutral Test</p> <p> ___ Other (Explain in Remarks)</p>
<p>Remarks: <u>Because area was being actively irrigated during sample period it is not possible to distinguish between irrigation and natural runoff.</u></p>	

Map Unit Name
(Series and Phase): _____

Drainage Class: Somewhat
poorly
 Field Observations
 Confirm Mapped Type? Yes No

Taxonomy (Subgroup): Cumelic Cryaquolls

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, - Structure, etc.
0-6	A1	10YR 2/1	—	—	L, 2 m ga
6-12	A2	10YR 2/1	7.5YR 4/6	F, 2, d	gd L, 2 f 56R

Hydric Soil Indicators:

- | | |
|--|---|
| <input type="checkbox"/> Histosol | <input type="checkbox"/> Concretions |
| <input type="checkbox"/> Histic Epipedon | <input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils |
| <input type="checkbox"/> Sulfidic Odor | <input type="checkbox"/> Organic Streaking in Sandy Soils |
| <input checked="" type="checkbox"/> Aquic Moisture Regime | <input checked="" type="checkbox"/> Listed on Local Hydric Soils List |
| <input type="checkbox"/> Reducing Conditions | <input type="checkbox"/> Listed on National Hydric Soils List |
| <input checked="" type="checkbox"/> Gleyed or <u>Low-Chroma</u> Colors | <input type="checkbox"/> Other (Explain in Remarks) |

Remarks: On 5-7% slope. Down from irrigation ditch, just upslope from willows.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? <u>Yes</u> No (Circle)	(Circle)
Wetland Hydrology Present? <u>Yes</u> No	
Hydric Soils Present? <u>Yes</u> No	Is this Sampling Point Within a Wetland? <u>Yes</u> No

Remarks:

Project/Site: <u>Shirley Ranch</u>	Date: <u>May 6, 1997</u>
Applicant/Owner: _____	County: <u>Summit</u>
Investigator: _____	State: <u>CO</u>
Do Normal Circumstances exist on the site? <input checked="" type="radio"/> Yes <input type="radio"/> No	Community ID: _____
Is the site significantly disturbed (Atypical Situation)? <input type="radio"/> Yes <input checked="" type="radio"/> No	Transect ID: _____
Is the area a potential Problem Area? <input type="radio"/> Yes <input checked="" type="radio"/> No	Plot ID: <u>16</u>
(If needed, explain on reverse.)	

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <u>Rosa montana</u>	<u>15</u>	<u>FAC-</u>	9. _____	_____	_____
2. <u>Poa pratensis</u>	<u>20</u>	<u>FACU</u>	10. _____	_____	_____
3. <u>Phleum pratense</u>	<u>35</u>	<u>FACU</u>	11. _____	_____	_____
4. <u>Carex sp.</u>	<u>30</u>	_____	12. _____	_____	_____
5. _____	_____	_____	13. _____	_____	_____
6. _____	_____	_____	14. _____	_____	_____
7. _____	_____	_____	15. _____	_____	_____
8. _____	_____	_____	16. _____	_____	_____

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). Less than 45%

Remarks: 25 feet above irrigation ditch under aspen overstory.
Soils are not hydric

HYDROLOGY

<input type="checkbox"/> Recorded Data (Describe in Remarks): <input type="checkbox"/> Stream, Lake, or Tide Gauge <input type="checkbox"/> Aerial Photographs <input type="checkbox"/> Other <input type="checkbox"/> No Recorded Data Available	Wetland Hydrology Indicators: Primary Indicators: <input type="checkbox"/> Inundated <input type="checkbox"/> Saturated in Upper 12 Inches <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands Secondary Indicators (2 or more required): <input type="checkbox"/> Oxidized Root Channels in Upper 12 Inches <input type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input type="checkbox"/> FAC-Neutral Test <input checked="" type="checkbox"/> Other (Explain in Remarks) <u>See below</u>
Field Observations: Depth of Surface Water: _____ (in.) Depth to Free Water in Pit: _____ (in.) Depth to Saturated Soil: _____ (in.)	
Remarks: <u>Some mottles were present even though sample was above irrigation ditch. This indicates some natural hydrology above irrigation ditch, but irrigation does influence hydrology below ditch.</u>	

Map Unit Name
(Series and Phase):

Cimena loam 15-35%

Drainage Class:
Field Observations

mod
Well

Taxonomy (Subgroup):

Argic Cryoborolls

Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, - Structure, etc.
0-8	A	10YR 2/1	—	—	L, 2 f ga
8-12	Bt	10YR 5/4	10YR 5/6	f 2, d	grl sck, 1 c sbk

Hydric Soil Indicators:

- | | |
|--|---|
| <input type="checkbox"/> Histosol | <input type="checkbox"/> Concretions |
| <input type="checkbox"/> Histic Epipedon | <input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils |
| <input type="checkbox"/> Sulfidic Odor | <input type="checkbox"/> Organic Streaking in Sandy Soils |
| <input type="checkbox"/> Aquic Moisture Regime | <input type="checkbox"/> Listed on Local Hydric Soils List |
| <input type="checkbox"/> Reducing Conditions | <input type="checkbox"/> Listed on National Hydric Soils List |
| <input type="checkbox"/> Gleyed or Low-Chroma Colors | <input type="checkbox"/> Other (Explain in Remarks) |

Remarks:

Bt contains Aw mottles but chroma is too light
Site is upgradient from irrigation ditch.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes No (Circle)
 Wetland Hydrology Present? Yes No
 Hydric Soils Present? Yes No

(Circle)
 Is this Sampling Point Within a Wetland? Yes No

Remarks:

Project/Site: <u>Shirley Ranch</u> Applicant/Owner: _____ Investigator: <u>DEM</u>	Date: <u>May 6, 97</u> County: <u>Summit</u> State: <u>CO</u>
Do Normal Circumstances exist on the site? <input checked="" type="radio"/> Yes <input type="radio"/> No Is the site significantly disturbed (Atypical Situation)? <input type="radio"/> Yes <input checked="" type="radio"/> No Is the area a potential Problem Area? <input type="radio"/> Yes <input checked="" type="radio"/> No (If needed, explain on reverse.)	Community ID: _____ Transect ID: _____ Plot ID: <u>17</u>

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <u>Agrostis alba</u>	<u>LO</u>	<u>FACU</u>	9. _____		
2. <u>Carex utriculata</u>	<u>15</u>	<u>OBL</u>	10. _____		
3. <u>Carex acinacracilis</u>	<u>5</u>	<u>FACU</u>	11. _____		
4. <u>Epilobium spp.</u>	<u>5</u>		12. _____		
5. <u>Rumex crispus</u>	<u>5</u>	<u>FACU</u>	13. _____		
6. <u>Salix spp.</u>	<u>10</u>		14. _____		
7. _____			15. _____		
8. _____			16. _____		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 85% +

Remarks: Sample site is most of Public Service between Willow Creek and old trail.
Some possible fill material within old channel.

HYDROLOGY

___ Recorded Data (Describe in Remarks): ___ Stream, Lake, or Tide Gauge ___ Aerial Photographs ___ Other ___ No Recorded Data Available	Wetland Hydrology Indicators: Primary Indicators: ___ Inundated ___ Saturated in Upper 12 Inches ___ Water Marks ___ Drift Lines ___ Sediment Deposits ___ <input checked="" type="checkbox"/> Drainage Patterns in Wetlands Secondary Indicators (2 or more required): ___ Oxidized Root Channels in Upper 12 Inches ___ Water-Stained Leaves ___ Local Soil Survey Data ___ FAC-Neutral Test ___ Other (Explain in Remarks)
Field Observations: Depth of Surface Water: _____ (in.) Depth to Free Water in Pit: _____ (in.) Depth to Saturated Soil: _____ (in.)	

Remarks: Possible hydrology is from Willow Creek when water level rises.
Hydrology may also be from irrigation or overland flow.

Map Unit Name _____
(Series and Phase): _____

Drainage Class: poorly
Field Observations _____
Confirm Mapped Type? Yes No

Taxonomy (Subgroup): Typic Cryaquolls

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, - Structure, etc.
0-6	A1	10YR 2/1	—	—	L, 2 m ga
6-11	A2	10YR 2/2	10YR 4/6	f, 2, d	gel SL, 2 m sbk

Hydric Soil Indicators:

- | | |
|---|---|
| <input type="checkbox"/> Histosol | <input type="checkbox"/> Concretions |
| <input type="checkbox"/> Histic Epipedon | <input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils |
| <input type="checkbox"/> Sulfidic Odor | <input type="checkbox"/> Organic Streaking in Sandy Soils |
| <input checked="" type="checkbox"/> Aquic Moisture Regime | <input type="checkbox"/> Listed on Local Hydric Soils List |
| <input type="checkbox"/> Reducing Conditions | <input type="checkbox"/> Listed on National Hydric Soils List |
| <input type="checkbox"/> Gleyed or Low-Chroma Colors | <input type="checkbox"/> Other (Explain in Remarks) |

Remarks: In old abandoned channel of Willow Creek,

WETLAND DETERMINATION

Hydrophytic Vegetation Present? <input checked="" type="radio"/> Yes <input type="radio"/> No (Circle)	(Circle)
Wetland Hydrology Present? <input checked="" type="radio"/> Yes <input type="radio"/> No	
Hydric Soils Present? <input checked="" type="radio"/> Yes <input type="radio"/> No	
Is this Sampling Point Within a Wetland? <input checked="" type="radio"/> Yes <input type="radio"/> No	

Remarks:

Project/Site: <u>Stirling Ranch</u>	Date: <u>6 May</u>
Applicant/Owner: _____	County: <u>Summit</u>
Investigator: <u>DEM</u>	State: <u>CO</u>
Do Normal Circumstances exist on the site? <input checked="" type="radio"/> Yes <input type="radio"/> No	Community ID: _____
Is the site significantly disturbed (Atypical Situation)? <input type="radio"/> Yes <input checked="" type="radio"/> No	Transect ID: _____
Is the area a potential Problem Area? <input type="radio"/> Yes <input checked="" type="radio"/> No	Plot ID: <u>18</u>
(If needed, explain on reverse.)	

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <u>Carex nebrascensis</u>	<u>OBL</u>	<u>75%</u>	9. _____	_____	_____
2. <u>Carex intromittata</u>	<u>OBL</u>	<u>25%</u>	10. _____	_____	_____
3. _____	_____	_____	11. _____	_____	_____
4. _____	_____	_____	12. _____	_____	_____
5. _____	_____	_____	13. _____	_____	_____
6. _____	_____	_____	14. _____	_____	_____
7. _____	_____	_____	15. _____	_____	_____
8. _____	_____	_____	16. _____	_____	_____

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 100%

Remarks: In small carex depression S. of old trail and about 200' from Willow Creek. Soils with a few mounds.

HYDROLOGY

<input type="checkbox"/> Recorded Data (Describe in Remarks): <input type="checkbox"/> Stream, Lake, or Tide Gauge <input type="checkbox"/> Aerial Photographs <input type="checkbox"/> Other <input checked="" type="checkbox"/> No Recorded Data Available	Wetland Hydrology Indicators: Primary Indicators: <input type="checkbox"/> Inundated <input type="checkbox"/> Saturated in Upper 12 Inches <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands Secondary Indicators (2 or more required): <input type="checkbox"/> Oxidized Root Channels in Upper 12 Inches <input type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks)
Field Observations: Depth of Surface Water: _____ (in.) Depth to Free Water in Pit: _____ (in.) Depth to Saturated Soil: _____ (in.)	
Remarks: <u>any runoff would collect a pond here. Some runoff could flow onto other small wetland areas. Water is directed uphill from site from Willow Creek and probably flows into depression.</u>	

Map Unit Name
(Series and Phase): _____

Drainage Class: well
Field Observations

Taxonomy (Subgroup): Tropic Crucaqualls

Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, - Structure, etc.
0-5	A1	7.5YR 3/2	—	—	gd SL, 2 f gr
5-10	A2	7.5YR 3/2	7.5YR 4/6	f, l, cl	v gd SL, 2 f sbk

Hydric Soil Indicators:

- | | |
|---|---|
| <input type="checkbox"/> Histosol | <input type="checkbox"/> Concretions |
| <input type="checkbox"/> Histic Epipedon | <input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils |
| <input type="checkbox"/> Sulfidic Odor | <input type="checkbox"/> Organic Streaking in Sandy Soils |
| <input checked="" type="checkbox"/> Aquic Moisture Regime | <input type="checkbox"/> Listed on Local Hydric Soils List |
| <input type="checkbox"/> Reducing Conditions | <input type="checkbox"/> Listed on National Hydric Soils List |
| <input type="checkbox"/> Gleyed or Low-Chroma Colors | <input type="checkbox"/> Other (Explain in Remarks) |

Remarks: Orange - red sand grains having similar color to mottle.
South of willow creek

WETLAND DETERMINATION

Hydrophytic Vegetation Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No (Circle)	(Circle)
Wetland Hydrology Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Hydric Soils Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Is this Sampling Point Within a Wetland? Yes <input checked="" type="checkbox"/> No

Remarks: Mottles + hydrophytic veg. probably due to irrigation,
Soil is mod. well drained - v. gravelly.

Project/Site: <u>Shirley</u> Applicant/Owner: _____ Investigator: <u>DEM</u>	Date: <u>6 May</u> County: <u>Summit</u> State: <u>CO</u>
Do Normal Circumstances exist on the site? <input checked="" type="radio"/> Yes <input type="radio"/> No Is the site significantly disturbed (Atypical Situation)? <input type="radio"/> Yes <input checked="" type="radio"/> No Is the area a potential Problem Area? <input type="radio"/> Yes <input checked="" type="radio"/> No (If needed, explain on reverse.)	Community ID: _____ Transect ID: _____ Plot ID: <u>19</u>

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <u>Phlox pratensis</u>	<u>60</u>	<u>FACU</u>	9. _____	_____	_____
2. <u>Taraxacum officinale</u>	<u>30</u>	<u>FACU</u>	10. _____	_____	_____
3. <u>Poa pratensis</u>	<u>10</u>	<u>FACU</u>	11. _____	_____	_____
4. _____	_____	_____	12. _____	_____	_____
5. _____	_____	_____	13. _____	_____	_____
6. _____	_____	_____	14. _____	_____	_____
7. _____	_____	_____	15. _____	_____	_____
8. _____	_____	_____	16. _____	_____	_____

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 0%

Remarks: Soil pit about 20 feet south of H 18, soil located out of vegetation.
Soils barely hydric

HYDROLOGY

___ Recorded Data (Describe in Remarks): ___ Stream, Lake, or Tide Gauge ___ Aerial Photographs ___ Other ___ No Recorded Data Available	Wetland Hydrology Indicators: Primary Indicators: ___ Inundated ___ Saturated in Upper 12 Inches ___ Water Marks ___ Drift Lines ___ Sediment Deposits ___ Drainage Patterns in Wetlands Secondary Indicators (2 or more required): ___ Oxidized Root Channels in Upper 12 Inches ___ Water-Stained Leaves ___ Local Soil Survey Data ___ FAC-Neutral Test ___ Other (Explain in Remarks)
Field Observations: Depth of Surface Water: _____ (in.) Depth to Free Water in Pit: _____ (in.) Depth to Saturated Soil: _____ (in.)	Remarks: <u>No indicators of wetland hydrology.</u>

Map Unit Name
(Series and Phase): _____

Drainage Class: well

Field Observations

Taxonomy (Subgroup): Tropic Craggulls

Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, - Structure, etc.
0-5	A1	7.5YR 3/2	—	—	gl sl, 2 f gn
5-11	A2	7.5YR 3/2	7.5YR 4/6	f. l, d	v. gl sl, 2 f sbk

Hydric Soil Indicators:

- | | |
|---|---|
| <input type="checkbox"/> Histosol | <input type="checkbox"/> Concretions |
| <input type="checkbox"/> Histic Epipedon | <input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils |
| <input type="checkbox"/> Sulfidic Odor | <input type="checkbox"/> Organic Streaking in Sandy Soils |
| <input checked="" type="checkbox"/> Aquic Moisture Regime | <input type="checkbox"/> Listed on Local Hydric Soils List |
| <input type="checkbox"/> Reducing Conditions | <input type="checkbox"/> Listed on National Hydric Soils List |
| <input type="checkbox"/> Gleyed or Low-Chrome Colors | <input type="checkbox"/> Other (Explain in Remarks) |

Remarks: Orange - red sand grains with similar color as mottles.
South of Willow Cr.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes <input checked="" type="radio"/> No (Circle)	(Circle)
Wetland Hydrology Present? Yes <input checked="" type="radio"/> No	
Hydric Soils Present? Yes <input checked="" type="radio"/> No	Is this Sampling Point Within a Wetland? Yes <input checked="" type="radio"/> No

Remarks: Mottles + hydrophytic veg. are probable the result of years of irrigation. Soil is mod-well drained, very gravelly.

Project/Site: <u>Shirley Ranch</u> Applicant/Owner: _____ Investigator: _____	Date: <u>6 May</u> County: <u>Summit</u> State: <u>CO</u>
Do Normal Circumstances exist on the site? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Is the site significantly disturbed (Atypical Situation)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is the area a potential Problem Area? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No (If needed, explain on reverse.)	Community ID: _____ Transect ID: _____ Plot ID: <u>20</u>

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <u>Bromus inermis</u>	<u>15</u>	<u>NL</u>	9. _____	_____	_____
2. <u>Carex stricta</u>	<u>25</u>	<u>OBL</u>	10. _____	_____	_____
3. <u>Pentstemon heterophyllus</u>	<u>10</u>	<u>FAC</u>	11. _____	_____	_____
4. <u>Achillea millefolium</u>	<u>20</u>	<u>FACU</u>	12. _____	_____	_____
5. <u>Lycium prostratum</u>	<u>20</u>	<u>FACU</u>	13. _____	_____	_____
6. <u>Poa pratensis</u>	<u>10</u>	<u>FACU</u>	14. _____	_____	_____
7. _____	_____	_____	15. _____	_____	_____
8. _____	_____	_____	16. _____	_____	_____

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): _____

Remarks: Site north of telephone poles.

HYDROLOGY

___ Recorded Data (Describe in Remarks): ___ Stream, Lake, or Tide Gauge ___ Aerial Photographs ___ Other ___ No Recorded Data Available	Wetland Hydrology Indicators: Primary Indicators: ___ Inundated ___ Saturated in Upper 12 Inches ___ Water Marks ___ Drift Lines ___ Sediment Deposits <input checked="" type="checkbox"/> Drainage Patterns in Wetlands Secondary Indicators (2 or more required): ___ Oxidized Root Channels in Upper 12 Inches ___ Water-Stained Leaves ___ Local Soil Survey Data ___ FAC-Neutral Test ___ Other (Explain in Remarks)
Field Observations: Depth of Surface Water: _____ (in.) Depth to Free Water in Pit: _____ (in.) Depth to Saturated Soil: _____ (in.)	Remarks: <u>Just 10 feet south soil is saturated to surface with 2" standing water, No influence of irrigation.</u>

Map Unit Name
(Series and Phase): _____

Drainage Class: pond
Field Observations
Confirm Mapped Type? Yes No

Taxonomy (Subgroup): Typic Cryosolls

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottla Colors (Munsell Moist)	Mottla Abundance/Contrast	Texture, Concretions, - Structure, etc.
0-5	A1	10YR 2/1	—	—	L, 2 f of
5-8	A2	10YR 2/1	7.5YR 4/6	f, i, d	gr SL, 2 m SBP

Hydric Soil Indicators:

- Histosol
- Histic Epipedon
- Sulfidic Odor
- Aquic Moisture Regime
- Reducing Conditions
- Gleyed or Low-Chroma Colors
- Concretions
- High Organic Content in Surface Layer in Sandy Soils
- Organic Streaking in Sandy Soils
- Listed on Local Hydric Soils List
- Listed on National Hydric Soils List
- Other (Explain in Remarks)

Remarks: Large cobbles at 8". Standing water 7' away. In willows along road in N. side of survey area.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	<input checked="" type="radio"/> Yes	No (Circle)	(Circle)
Wetland Hydrology Present?	<input checked="" type="radio"/> Yes	No	
Hydric Soils Present?	<input checked="" type="radio"/> Yes	No	
Is this Sampling Point Within a Wetland?			<input checked="" type="radio"/> Yes No

Remarks:

Erik Olgeirson, PhD
Consulting Ecologist

a Partnership

Ecology
Land Use Planning
Landscape Architecture

January 8, 1999

Mr. Andrew Bush
Redstone Group
331 15th St.
Second Floor
Denver, Colorado 80202

Dear Andy:

Attached are wetland delineations for the Cordillera property and the Silver Mountain property (formerly the Smith Ranch and the Shirley Ranch). Both properties are owned by Seminole Land Holdings, Inc. Included in the submittal are delineation reports and mapping.

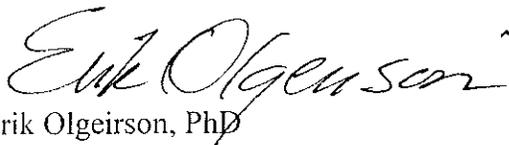
The Cordillera property was delineated in September of 1998. The wetland resource is 41.2 acres.

The Silver Mountain property was delineated by Western Ecological Resource, Inc. The site was revisited in November of 1998 using current aerial photographs. Changes were determined in two wetlands. Wetland 5 no longer exists; a portion of Wetland 9 has been disturbed. The US Army Corps of Engineers has previously indicated that a Section 404 Department of the Army Permit would be granted for Wetland 5 (refer to Western Ecological Resource, Inc letter dated August 18, 1997). The remaining wetland acreage is 15.2 acres.

The delineation documentation will be forwarded to the Corps for verification following your review. Michael Claffey from the Sacramento District of the Corps has visited both properties.

Please call on me if you need additional information.

Sincerely,



Erik Olgeirson, PhD
Attachments
cord simo wede

Cordillera Wetland Delineation



Seminole Land Holdings, Inc.
Summit County, Colorado
September 1998

Prepared by

Erik Olgeirson, PhD.
Consulting Ecologist

a Partnership

4440 Tule Lake Drive
Littleton, Colorado 80123
303 347 8212
303 347 8348 fax

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Date Printed: 01/07/99

1 SITE CONTEXT

The project area is located in the Town of Silverthorne in Summit County, Colorado, approximately 2 miles north of the Silverthorne Town Hall. The project area lies just east of the Blue River (Drawing 1) (Section 36, Township 4S, Range 78W, Latitude 39°39', Longitude 106°4' 30"). The property is currently used as pasture (Drawing 1 -Vicinity Map).

The Cordillera property includes two adjacent parcels owned by Seminole Land Holdings, Inc. The two parcels total approximately 500-600 acres, of which 41.48 acres are composed of a herbaceous and scrub wetland. Figure 2 displays the delineated wetlands.

2 METHODOLOGY

Field investigations were conducted to delineate existing wetlands in the project area. A routine survey was done in accordance with guidelines developed by the Department of the Army, Corps of Engineers in the 1987 publication titled: Corps of Engineers Wetlands Delineation Manual (Department of the Army, 1987).

The herbaceous channel wetland was field checked in September of 1998. The presence and composition of hydrophytic vegetation was determined in the field. Final mapping was accomplished at a scale of 1"=30'. Soils were examined for hydric characteristics using soil pit sampling methods. The presence of hydrologic characteristics supporting existing wetlands was made by visual observation.

3. WETLAND DESCRIPTIONS

Herbaceous Complex

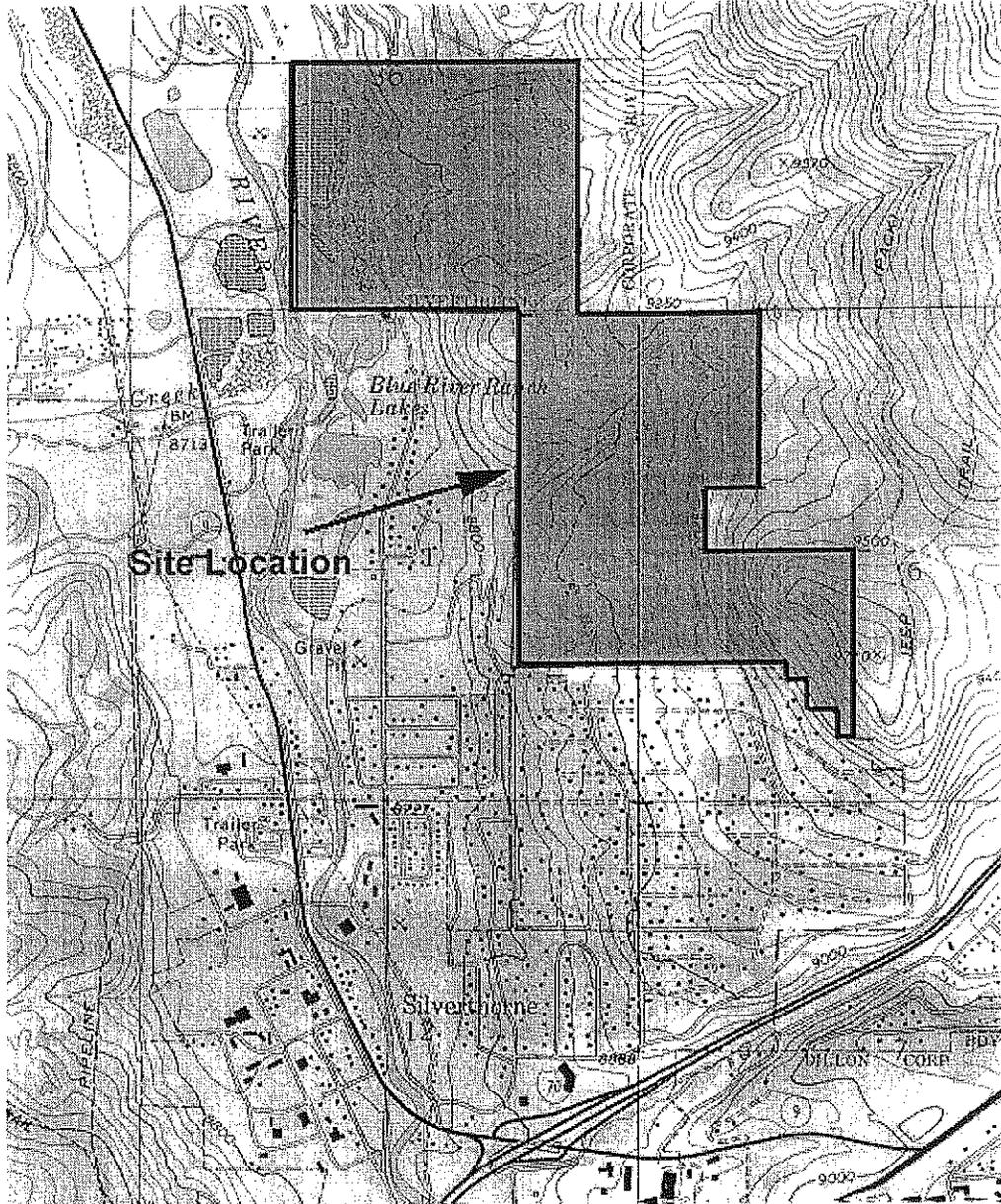
Vegetation: A herbaceous wetland complex is located along the edges of the large pond adjacent to the Ponds at Blue River property. Wetland vegetation consists of water sedge (*Carex aquatilis*), bluejoint reed grass (*Calamagrostis canadensis*), rostrate sedge (*Carex utriculata*), Nebraska sedge (*Carex nebraskensis*) and mountain willow (*Salix monticola*).

Hydrology: Water is evident at the soil surface, and saturated within the soil column. Hydrology is supplied from groundwater provided by the numerous ponds in the area and runoff from uphill slopes.

Soils: The herbaceous wetland has mucky organic soils. These histic soils are very dark brown to black sandy clay with Munsell readings of 10YR 2/1.

Function and Quality: These wetlands provide habitat for small mammals, birds, amphibians and reptiles. Other important functions are groundwater recharge, production export, nutrient retention and nutrient removal.

Figure 1. Vicinity Map



Willow Carr Wetlands

Vegetation: Willow carr wetlands exist along channels that cut downslope on the southern most parcel and on the steep grade of the northern parcel. Mountain (*Salix monticola*) and Geyer's willow (*Salix geyeriana*) dominate the site. Understory varies from cow parsnip (*Heracleum sphondylium*) to dense patches of Torrey's rush (*Juncus torreyi*), rostrate sedge (*Carex utriculata*) and field sedge (*Carex microptera*).

Hydrology: Hydrology is supplied by surface water from the respective channels.

Soils: Soils are marginal grassline soils with Munsell readings of 10YR 4/2 in most areas. Soils are dark brown, thick A-layer molisols with a thin layer of clay. Attempts at soil pits were rejected at 8".

**TABLE 1
PLANT SPECIES LIST**

COMMON NAME	SCIENTIFIC NAME
Trees	
Aspen	<i>Populus tremuloides</i>
Shrubs	
Geyers willow	<i>Salix geyeriana</i>
Mountain willow	<i>Salix monticola</i>
Forbaceous Plants	
Cow parsnip	<i>Heracleum sphondylium</i>
Curly dock	<i>Rumex crispus</i>
Grasses/Sedges	
Water sedge	<i>Carex aquatilis</i>
Rostrate sedge	<i>Carex uticulata</i>
Nebraska sedge	<i>Carex nebraskensis</i>
Canada reed-grass	<i>Calamagrostis canadensis</i>
Western wheatgrass	<i>Agropyron smithii</i>
Timothy	<i>Phleum pratense</i>

TABLE 2
WETLAND FUNCTIONS

WETLAND TYPE	Herbaceous/Willow Carr		
	HYDROLOGY		
	Alluvium/Colluvium		
SOILS	LOW	MED	HIGH
FUNCTION			
Groundwater Recharge	██████████		
Groundwater Discharge	██████████		
Floodflow Attenuation	██████████		
Sediment Stabilization	██████████		
Sediment Retention	██████████		
Nutrient Removal	██████████	██████████	
Nutrient Retention	██████████	██████████	
Production Export	██████████	██████████	
Wildlife Abundance	██████████	██████████	
Wildlife-Breeding	██████████		
Wildlife Migration	██████████		
Wildlife-Wintering	██████████		
Aquatic Abundance	██████████		
Uniqueness	██████████		
Recreation	██████████	██████████	

APPENDIX JURISDICTIONAL REQUIREMENTS

Section 404 of the Clean Water Act of 1977, revised 1992, states that a permit may be needed for the discharge of dredged or fill material into Waters of the US, including wetlands.

Wetland delineation studies are required by the Act in order to determine potential effects of dredge or fill activities in navigable waters, waters of the United States or wetlands. Dredge material is that which is excavated or dredged from water and wetlands. Fill material is that which is used for the primary purpose of replacing an area of a water body with dry land or for changing the bottom elevation of a water body.

The result of this Act concerning Waters of the US is that at any time material is to be put into or taken from a stream or adjacent wetlands, compliance with the Act must be achieved. The principal responsibility for regulating the Clean Water Act lies with the US Army Corps of Engineers. Other agencies with which permitting must be coordinated include the US Environmental Protection Agency, the US Fish and Wildlife Service, and state agencies including agencies concerned with wildlife and water quality.

METHODOLOGY

A. Inventory, Mapping and Sampling

Potential wetland areas to be studied were determined from a comprehensive level survey of wetlands based on vegetation and soil sampling. All potential areas were examined using the three-parameter approach for hydric characteristics described below. Wetlands previously delineated were verified during the field investigations. Maps of wetlands occurring in the project site have been prepared at a scale of 1" = 300' from existing topographic maps and aerial photography. Maps were field checked and potential wetlands were characterized using the guidelines described in: Department of the Army, Waterways Experiment Station, Corps of Engineers - Corps of Engineers Wetlands Delineation Manual (Department of the Army, 1987). These guidelines are used to determine wetlands on the basis of interrelated analyses of vegetation, soils, and hydrology described below. A given area must contain evidence of each of the three indicators to be considered a jurisdictional wetland.

Diagnostic characteristics used in identifying wetlands that occur in the project area for each of the three factors in the multi-parameter analysis are as follows:

I. Vegetation: The predominance of plant species that are typically adapted to life within habitats that have permanent or alternating dry and inundated and/or saturated soil conditions. The following classifications of plants as indicators of wetland or non-wetland conditions apply to this criterion (Reed, 1988):

- **upland species** are almost always found in uplands (>99% probability)
- **facultative upland species** are commonly found in uplands, but may occur in wetlands (1 - 33% probability)
- **facultative species** may or may not occur in wetlands (34-66% probability)
- **facultative wetland species** are commonly found in wetlands (67-99% probability)
- **obligate species** are always found in wetlands under natural conditions, but may persist in non-wetlands if planted or if wetlands have been transformed (>99% probability)

Classification as a wetland requires that an area have a plant species composition of: (1) 50 percent or greater by those plants classified as obligate, facultative wetland, and/or facultative species, or (2) a frequency analysis of all species within a community yielding a prevalence index value less than 3.0. Vegetation was visually characterized in each wetland area identified from aerial photography. Plant taxonomy is according to Weber (1987).

2. Hydrology: The area must be inundated or saturated by surface water or groundwater permanently or intermittently during the growing season for at least 7 days. Hydrologic conditions are assessed through examination of surface vegetation, surface water, and soil conditions in random locations. Evidence of wetland hydrology was visually determined in the field. Factors examined included apparent ponding, temporary flood storage, erosion, sedimentation and ground water discharge.

3. Soils: Soils within the root zone must be saturated permanently or intermittently during the growing season. Hydric soils are identified by various mottled and waterlogged (gleyed) conditions apparent from surface examination of vegetation and hydrologic conditions or from digging test holes in random locations. Mottles are spots of contrasting colors indicating a fluctuating water table. Gleying is defined as gray soil colors produced by the reduction of soil elements, such as iron and manganese.

Soil characteristics were verified during the vegetation sampling. Soil grab samples were taken to a depth of up to 16 inches in each site and examined in the field for hydric characteristics, such as mottles and gleying. Soil texture, color (Kollmorgen Corp, 1975), relative moisture content and other significant features were also noted.

B Classification

Wetlands inventoried in the project area have been classified according to the US Fish and Wildlife Service hierarchical classification system developed by Cowardin (Cowardin et al., 1979). A modified classification is also used to simplify the description of existing wetlands.

C Functional Analysis

Wetlands identified were classified according to a functional analysis developed by the US Department of Transportation (USDOT, 1983). This method places wetlands in categories of functions that they perform:

- Groundwater recharge
- Shoreline anchoring
- Flood storage and desynchronization
- Nutrient retention and removal
- Fisheries habitat
- Active and passive recreation and heritage value
- Groundwater discharge
- Dissipation of erosive forces
- Sediment Trapping
- Food chain support/Nutrient export
- Wildlife habitat

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National List of Plant Species that Occur in Wetlands: National Summary, U.S. Fish and Wildlife Service, Washington, D.C., Biol.
Rpt. 88(24), 244pp.
Federal Manual for Identifying and Delineating Jurisdictional Wetlands, An Interagency Cooperative Publication. 76pp.
- U.S. Department of Transportation. 1983
A Method for Wetland Functional Analysis, Volume 1. Report No. FHWA-IP-82-23. 176pp.
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Colorado Flora: Western Slope. Colorado Associated University Press, Boulder, Colorado. 530pp.

SITE ID Investigator

Normal Conditions?	yes	Community ID	<i>Salix-Carex</i>
Significant Disturbance?	no	Transect ID	1
Potential Problem Area?	no	Plot ID	1

Remarks:

Upslope drainage to Ponds

VEGETATION

Dominant Species	Stratum	Indicator	Other Species	Stratum	Indicator
<i>Salix monticola</i>	shrub	obl	<i>Agrostis gigantea</i>	herb	obl
<i>Salix geyeriana</i>	shrub	obl	<i>Carex microptera</i>	herb	facw
<i>Salix scouleriana</i>	shrub	obl	<i>Glyceria striata</i>	herb	obl
<i>Carex aquatilis</i>	shrub	obl	<i>Agropyron smithii</i>	herb	fac
<i>Rumex crispus</i>	herb		<i>Carex microptera</i>	herb	obl
<i>Eleocharis</i>	herb		<i>Heracleum lanatum</i>	herb	
<i>Carex utriculata</i>	shrub	obl	<i>Juncus torreyi</i>	herb	facw
<i>Calamagrostis canadensis</i>	shrub	obl			

percent dominant species that are OBL FACW and FAC 90

Remarks:

Riparian wetland around pond continues upslope to a smaller pond where *Calamagrostis* dominates with rabbit brush as defining boundary

HYDROLOGY

Recorded Data

stream or lake
aerial photography
monitoring wells
none

yes
yes
no

Wetland Hydrology Indicators

inundated	yes
saturated in upper 12"	yes
water marks	no
drift lines	no
sediment deposits	yes
drainage patterns	
rhizophores in upper 12"	no
water stained leaves	yes
local soil survey data	no
FAC neutral test	no
other (specify)	

Remarks:

SOILS

Map Unit Name	unknown	Drainage Class	poorly
Series & Phase	unknown	Confirm Map Type	yes
Taxonomic Subgroup	cumulic cryaquoll		

Cordillera Wetland Delineation
Blue River, Silverthorne, Colorado

eanel wedeform.doc

Profile Descriptions					Texture, Concretions, Structure
Depth inches	Horizon	Matrix Color	Mottle Color	Mottle Abundance Contrast	
0-20	A1	10yr2/1	10yr4/1	none	clay

Remarks:

Soil mucky in area immediately adjacent to the pond

Hydric Soil Indicators

histisol	<input type="checkbox"/>	concretions	<input type="checkbox"/>
histic epipedon	<input type="checkbox"/>	high organic content	<input type="checkbox"/>
sulfide odor	<input type="checkbox"/>	organic streaking	<input type="checkbox"/>
aquic soil moisture regime	<input type="checkbox"/>	on local hydric soil list	<input type="checkbox"/>
reducing conditions	<input type="checkbox"/>	on nat'l hydric soil list	<input type="checkbox"/>
gleyed or low chromas	<input type="checkbox"/>	fibric	<input type="checkbox"/>
other	<input type="checkbox"/>		<input type="checkbox"/>

Remarks:

WETLAND DETERMINATION

hydrophytic vegetation	<input type="checkbox"/>	sampling point in a wetland?	<input type="checkbox"/>
wetland hydrology	<input type="checkbox"/>		
hydric soils	<input type="checkbox"/>		

Remarks:

RESTORATION POTENTIAL

	1	2	3	4	5	6	7	8	9	10	max
technical factors											
other factors											

MITIGATION OPPORTUNITIES

	1	2	3	4	5	6	7	8	9	10	max
adjacent areas											
restoration											
creation											
new											
enlarged											
new creation											

SITE ID Investigator

Normal Conditions?	<input type="text" value="yes"/>	Community ID	<input type="text" value="Salix-Calamagrostis"/>
Significant Disturbance?	<input type="text" value="no"/>	Transect ID	<input type="text" value="1"/>
Potential Problem Area?	<input type="text" value="no"/>	Plot ID	<input type="text" value="1"/>

Remarks:

VEGETATION

Dominant Species	Stratum	Indicator	Other Species	Stratum	Indicator
<i>Salix monticola</i>	shrub	obl	<i>Agropyron smithii</i>	herb	fac
<i>Calamagrostic canadensis</i>	herb	obl	<i>Carex microptera</i>	herb	facw
<i>Carex aquatilis</i>	herb	obl	<i>Phleum pratense</i>	herb	fac
<i>Glyceria striata</i>	herb	obl			

percent dominant species that are OBL FACW and FAC

Remarks:

HYDROLOGY

Recorded Data

stream or lake
aerial photography
monitoring wells
none

<input type="text" value="yes"/>
<input type="text" value="yes"/>
<input type="text" value="no"/>
<input type="text"/>

Wetland Hydrology Indicators

<input type="text" value="inundated"/>	<input type="text" value="no"/>
<input type="text" value="saturated in upper 12\"/>	<input type="text" value="yes"/>
<input type="text" value="water marks"/>	<input type="text" value="no"/>
<input type="text" value="drift lines"/>	<input type="text" value="no"/>
<input type="text" value="sediment deposits"/>	<input type="text" value="no"/>
<input type="text" value="drainage patterns"/>	<input type="text"/>
<input type="text" value="rhizophores in upper 12\"/>	<input type="text" value="yes"/>
<input type="text" value="water stained leaves"/>	<input type="text" value="no"/>
<input type="text" value="local soil survey data"/>	<input type="text" value="yes"/>
<input type="text" value="FAC neutral test"/>	<input type="text" value="no"/>
<input type="text" value="other (specify)"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>

Field Data

depth of surface water
depth to free water in pit
depth to saturated soil

Remarks:

SOILS

Map Unit Name	<input type="text" value="unknown"/>	Drainage Class	<input type="text" value="poorly"/>
Series & Phase	<input type="text" value="unknown"/>	Confirm Map Type	<input type="text" value="yes"/>
Taxonomic Subgroup	<input type="text" value="cumulic cryaqoll"/>		

Cordillera Wetland Delineation
Blue River, Silverthorne, Colorado

Profile Descriptions

Depth inches	Horizon	Matrix Color	Mottle Color	Mottle Abundance Contrast	Texture, Concretions, Structure
0-20	A1	10yr2/1	10yr4/1	fine Fe2	clay
20-28	B1	10yr4/1	none	none	sandy loam

Remarks:

Hydric Soil Indicators

histisol	yes	concretions	no
histic epipedon	yes	high organic content	yes
sulfide odor	no	organic streaking	yes
aquic soil moisture regime	yes	on local hydric soil list	unknown
reducing conditions	yes	on nat'l hydric soil list	unknown
gleyed or low chromas	yes	fibric	no
other			

Remarks:

WETLAND DETERMINATION

hydrophytic vegetation	yes	sampling point in a wetland?	yes
wetland hydrology	yes		
hydric soils	yes		

Remarks:

RESTORATION POTENTIAL

	1	2	3	4	5	6	7	8	9	10	max
technical factors											
other factors											

MITIGATION OPPORTUNITIES

	1	2	3	4	5	6	7	8	9	10	max
<u>adjacent areas</u>											
restoration											
creation											
new											
enlarged											
<u>new creation</u>											

SITE ID Investigator Date

Normal Conditions?	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no	Community ID	<input type="text" value="Salix"/>
Significant Disturbance?	<input checked="" type="checkbox"/> yes <input type="checkbox"/> no	Transect ID	<input type="text"/>
Potential Problem Area?	<input checked="" type="checkbox"/> yes <input type="checkbox"/> no	Plot ID	<input type="text"/>

Remarks:

VEGETATION

Dominant Species*	Stratum	Indicator	Dominant Species	Stratum	Indicator
<i>Salix monticola</i>	shrub	obl	<i>Lavigaetum</i>	herb	
<i>Salix exigua</i>	shrub	obl	<i>Juncus torreyi</i>	herb	2
<i>Carex utriculata</i> *	herb	obl	<i>Carex microptera</i>	herb	1
<i>Glyceria striata</i>	herb	obl	<i>Heracleum sphondylium</i>	herb	3
<i>Iris missouriensis</i>	herb		<i>Trifolium fendleri</i>	herb	3
<i>Phleum pratense</i>	herb		<i>Rumex crispus</i>	herb	2

percent dominant species that are OBL FACW and FAC

Remarks:

HYDROLOGY

Recorded Data

stream or lake
aerial photography
monitoring wells
none

Field Data

depth of surface water
depth to free water in pit
depth to saturated soil

<input type="text" value="no"/>
<input type="text" value="yes"/>
<input type="text" value="no"/>
<input type="text"/>
<input type="text"/>
<input type="text" value="0''"/>
<input type="text" value="N/A''"/>
<input type="text" value="N/A"/>

Wetland Hydrology Indicators

Inundated	<input type="text" value="no"/>
saturated in upper 12"	<input type="text" value="yes"/>
water marks	<input type="text" value="no"/>
drift lines	<input type="text" value="no"/>
sediment deposits	<input type="text" value="no"/>
drainage patterns	<input type="text" value="channel"/>
rhizophores in upper 12"	<input type="text" value="no"/>
water stained leaves	<input type="text" value="no"/>
local soil survey data	<input type="text" value="no"/>
FAC neutral test	<input type="text" value="no"/>
other (specify)	<input type="text"/>
	<input type="text"/>
	<input type="text"/>

Remarks:

SOILS

Map Unit Name	<input type="text" value="Unknown"/>	Drainage Class	<input type="text" value="poor"/>
Series & Phase	<input type="text" value="Unknown"/>	Confirm Map Type	<input type="text" value="no"/>
Taxonomic Subgroup	<input type="text" value="Molisol"/>		

Cordillera Wetland Delineation
Blue River, Silverthorne, Colorado

Profile Descriptions

Depth inches	Horizon	Matrix Color	Mottle Color	Mottle Abundance Contrast	Texture, Concretions, Structure

Remarks:

Grassline soil – dark brown; Thick A-layer molisol to 8”; thin layer of clay - sheet flow is a possibility

Hydric Soil Indicators

histisol	no	Concretions	no
histic epipedon	no	high organic content	yes
sulfide odor	no	organic streaking	no
aquic soil moisture regime	no	on local hydric soil list	unknown
reducing conditions	no	on nat'l hydric soil list	unknown
gleyed or low chromas	no	fibric	no
other			

Remarks:

Soils do not indicate wetland in upper 6-8”, but other criteria are there

WETLAND DETERMINATION

hydrophytic vegetation	<input checked="" type="checkbox"/> yes	<input type="checkbox"/> no	sampling point in a wetland?	<input checked="" type="checkbox"/> yes	<input type="checkbox"/> no
wetland hydrology	<input checked="" type="checkbox"/> yes	<input type="checkbox"/> no			
hydric soils	<input checked="" type="checkbox"/> yes	<input checked="" type="checkbox"/> no			

Remarks:

RESTORATION POTENTIAL

	1	2	3	4	5	6	7	8	9	10	max
technical factors											
other factors											

MITIGATION OPPORTUNITIES

	1	2	3	4	5	6	7	8	9	10	max
<u>adjacent areas</u>											
restoration											
creation											
new enlarged											
new creation											

