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June 5, 2008
Project Number 83088

Steve Moore
United States Army Corps of Engineers
Colorado/Gunnison Regulatory Office
400 Rood Avenue, Room 142
Grand Junction, Colorado, 81501

Subject: Preliminary Wetland Delineation and Jurisdictional Determination
Prepared for:
Energy Fuels Resource Corporation
Piñon Ridge Uranium Mill
19610 State Highway 90
Bedrock, Montrose County, Colorado

Dear Mr. Moore:

Kleinfelder West, Inc. (Kleinfelder) is currently providing licensing support services to Energy Fuels Resource Corporation for the development of a proposed uranium mill in Bedrock, Montrose County, Colorado. As part of these services, Kleinfelder has conducted the enclosed Preliminary Wetland Delineation and Jurisdictional Determination for the proposed property. The subject property is located at 19610 State Highway 90 southeast of Bedrock, Colorado.

Based on our findings, no USACE jurisdictional wetland resources were observed within the proposed property; however, one ephemeral stream was determined to be a potential Waters of the United States and subject to USACE jurisdiction. As a result, Kleinfelder requests a review of our conclusions and a verification of our findings. Your review of this report will be greatly appreciated in our continued efforts to support our client.

If you should have any questions or comments please feel free to contact me at (303) 237-6601.

Regards,

Kleinfelder West, Inc.

Jeffrey J. Meyer
Staff Professional I

JJM:jw

Attachment: Preliminary Wetland Delineation and Jurisdictional Determination

PRELIMINARY DELINEATION OF JURISDICTIONAL WATERS OF THE UNITED STATES ENERGY FUELS RESOURCE CORPORATION PIÑON RIDGE URANIUM MILL LICENSING SUPPORT KLEINFELDER PROJECT NO. 83088

April 28, 2008
REVISED - JUNE 4, 2008

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Revision: 1

Prepared By:

8300 Jefferson NE, Suite B
Albuquerque, New Mexico 87113

PRELIMINARY DELINEATION OF JURISDICTIONAL WATERS OF THE UNITED STATES ENERGY FUELS RESOURCE CORPORATION PIÑON RIDGE URANIUM MILL LICENSING SUPPORT KLEINFELDER PROJECT NO. 83088

Prepared for: Energy Fuels Resource Corporation
Lakewood, Colorado

Prepared by: Kleinfelder West, Inc.
Albuquerque, New Mexico

Author Approval: _____ 6/05/08
Jeffrey J. Meyer, Staff Professional I — Date

Project Manager Approval: _____ 6/05/08
Alan K. Kuhn, PhD, PE, RG, CEG — Date

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1. EXECUTIVE SUMMARY

Energy Fuels Resource Corporation (EFR) plans to license, construct, and operate an acid-leach conventional uranium mill on 880 acres of private property located at 16910 Highway 90, Bedrock, Colorado 81411. The mill will process uranium and vanadium ores with a 1,000 ton per day milling capacity and the operating life of the mill will be 20 to 30 years. The mill license, which is a Radioactive Source Material License, will be issued and administered by the Colorado Department of Public Health and Environment (CDPHE).

Under the Federal Pollution Control Act, popularly known as the Clean Water Act (CWA), Section 404 and Section 10 of the Rivers and Harbors Act of 1899 (33 Code of Federal Regulations (CFR) Parts 320-330), the Environmental Protection Agency and the U.S. Army Corps of Engineers (USACE) share regulatory authority over Waters of the U.S. (WoUS). Kleinfelder was retained by EFR to conduct a wetland delineation of the 880-acre Piñon Ridge property and assess the property for potential jurisdictional (WoUS).

During previous and subsequent field visits the perimeter and the interior portions of the property were traversed and areas of interest were flagged for further investigation. Each area of interest was surveyed for plant speciation, soils, and hydrology as per the USACE Wetland Delineation Manual 1987 and the Interim Regional Supplement: Arid West Region (2007). Trimble GeoXT GPS equipment was used to define the perimeter of the areas containing hydrophytic vegetation, hydric soils, wetland hydrology, and/or features characteristic of WoUS.

One potential jurisdictional wetland feature was observed within the study area and was identified as a retention pond that has historically been used to water cattle (Appendix A-1 Photograph 1, Figure 3). This shallow depression, located in the southern portion of the study area was dry at the time of previous field efforts in September, 2007 and inundated during the wetland determination in April, 2008. The retention pond is limited to the north by a 15 to 20 foot high man-made earthen berm and unconfined sheetflow is the primary source of sustained hydrology. There was no observed stream entering or exiting the retention pond. Based on data collected in the field, this area did not meet the USACE criteria as a wetland.

The study area contained ten linear stream features. The features were defined by an ordinary high water mark and six canyon streams. The canyon streams were defined by rock bed and bank. None of these features were associated with wetlands. Streams

No. 1-1, 2, 3, 4, and the six canyon streams 5, 6, 7a, 7b, 8, 9 and 10 were observed as discontinuous ephemeral streams and not considered to be jurisdictional by the USACE. Kleinfelder observed stream No. 1-2 to be connected to East Paradox Creek, which is under jurisdiction of the USACE.

2. INTRODUCTION

2.1 REGULATORY SETTING

Water resources, their course, and associated habitats can be under the jurisdiction of multiple regulatory resource agencies. The three main regulatory agencies and their jurisdictional resources are listed below. Other federal, state, and local agencies may need to be involved in a project if special resources are observed or if the project occurs in a special planning area.

Under the Federal Pollution Control Act, popularly known as the Clean Water Act (CWA), Section 404 and Section 10 of the Rivers and Harbors Act of 1899 (CFR Parts 320-330), the Environmental Protection Agency (EPA) and the United States Army Corps of Engineers (USACE) have regulatory authority over "Waters of the U. S." (WoUS). WoUS include all waters that:

> *"...are, have, or may be used for interstate and/or international commerce, including all water that is subject to the tide; all waters that are rivers, streams, sloughs, lakes, mudflats, sandflats, wetlands, wet meadows, prairie potholes, playa lakes, or natural ponds and the use, degradation, or destruction, of above mentioned, which could affect interstate and international commerce; all impoundment of above mentioned; all tributaries of above mentioned; territorial seas; and all wetlands adjacent to above mentioned Waters of The U.S. (WoUS). In areas where wetlands are absent, the jurisdictional boundary for the Corps (USACE) is the ordinary high water mark (OHWM)."*

Methods for delineating WoUS in arid stream systems are required for establishing jurisdictional responsibilities under the CWA (33 U.S.C. 1344). In non-tidal waters lacking adjacent wetlands, USACE jurisdiction extends to the OHWM, which is defined in 33 CFR Part 328.3 as the line on the bank established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in character of the soil, destruction of terrestrial vegetation, or the presence of litter and debris.

In practice, the OHWM for a stream is usually determined by examining recent physical evidence of flow in the stream channel. In dryland fluvial systems typical of southwestern desert areas, the most common physical characteristics indicating the OHWM include, but are not limited to, a clear natural scour line impressed on the bank, recent bank erosion, destruction of native terrestrial vegetation, and the presence of litter and debris (USACE South Pacific Division 2001).

This approach to delineating WoUS is different from the approach used to delineate wetlands. In the case of wetlands, there are criteria for hydrology, soils and vegetation specified in the USACE wetland delineation manual (Environmental Laboratory 1987 and subsequent guidance from USACE Headquarters). In contrast, there is no hydrologic definition of ordinary high water, and the identification of the WoUS relies entirely on physical features of streams.

For the purposes of this report, the "Southwest" is broadly defined to include all portions of ten arid to semi-arid western states: Arizona, California, Colorado, Idaho, Nevada, New Mexico, Oregon, Utah, Wyoming, and Texas. The USACE is required to consult with other federal agencies that share responsibility for natural resources. With regards to WoUS and wetlands, the primary agencies the USACE must consult with are the United States Fish and Wildlife Service (FWS) and National Marine Fisheries Service (NMFS) regarding any concerns of impacts to federally protected species of concern. This consultation is regulated through Section 7 of the Endangered Species Act.

The filling or grading of wetlands and WoUS is regulated by the USACE under Section 404 of the CWA. Mitigation measures may be required where project impacts are deemed significant. If there is no hydrologic connection between wetlands and WoUS, the wetlands may be considered isolated and may not be considered within the jurisdiction of the USACE.

2.2 PROJECT DESCRIPTION

Energy Fuels Resource Corporation (EFR) plans to license, construct, and operate an acid-leach conventional uranium mill on 880 acres of private property located at 16910 Highway 90, Bedrock, Colorado 81411 (Figure 1). A proposed project layout map is provided as Figure 2. The mill will process uranium ores with a 1,000 ton of ore per day milling capacity and the operating life of the mill will be 20 to 30 years. The mill license, which is a Radioactive Source Material License, will be issued and administered by the Colorado Department of Public Health and Environment (CDPHE).

2.2.1 Project Location

The EFR mill site (study area) is located on the Piñon Ridge property at 16910 Highway 90, Bedrock, Colorado 81411. The property's legal description is the Southwest ¼ of the Southeast ¼ of Section 5, all of Section 8, the North ¼ of Section 17, and the Southeast ¼ of the Northwest ¼ of Section 17, Township 46 North, Range 17 West, of

the New Mexico Principal Meridian. The study area is located on the Davis Mesa Quadrangle USGS 1:24,000 topographical map (Figure 1).

The study area lies approximately 13 miles west of Naturita, Colorado and approximately seven miles east of Bedrock, Colorado on Colorado State Highway 90 within what is known as the Paradox Valley. The Paradox Valley was formed by a collapsed salt anticline (graben structure) creating bluffs above the valley floor on both the north and south sides. Formation of the salt-cored anticline is believed to be controlled by major subsurface faults that displace bedrock beneath the evaporitic Paradox Formation (Cater, 1970). The graben structure is a collapse feature which formed in response to salt migration and dissolution from beneath the area (Cater, 1954, 1955a, 1955b). These processes occurred millions of years ago and are no longer considered to be active. Faults in this area are generally high-angle normal and downthrown towards the interior of the graben, although some faults are antithetic. The Paradox Valley obtains its name from the anomaly that the Dolores River crosses Paradox Valley perpendicular to the valley floor, while there is no river reaching through the valley. The valley floor is approximately 5,300 feet (ft) above mean sea level (MSL), while the bluffs can reach to approximately 6,800 ft above MSL in the immediate area.

2.2.2 Contact Information

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2.3 PURPOSE OF ASSESSMENT AND JURISDICTIONAL CRITERIA

Water resources, their course, and associated habitats can be under the jurisdiction of multiple regulatory resource agencies. This report addresses the USACE jurisdiction over these features. Other federal, state, and local agencies may need to be involved in a project if special resources are observed, or if the project occurs in a special planning area. USACE has developed a method to identify jurisdictional features under Section 404 of the CWA. These guidelines were used to delineate potential WoUS, identified on the study area.

The jurisdictional boundary for the USACE is the OHWM defined in 33 CFR Part 328.3. OHWM is defined as the line on the shore established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas. This standard is typically used to delineate rivers, streams, bays, lakes, and other standing water.

The concept of OHWM was originally employed to delineate the extent of tidal and navigable waters. This concept has also been carried forward to include non-tidal waters. In stream channels, including those in arid regions, the OHWM boundary is determined by examining recent physical evidence of surface flow. The definition of OHWM is based on physical evidence and lacks any statements concerning the duration and frequency of events.

It should be noted that while the USACE Jurisdictional Determination Form Instructional Guidebook provides guidance and standards for the determination of WoUS, interpretation of field condition is not always simple. It is the purview of the regulatory agency to accept or amend delineations submitted to them. Therefore, this delineation should be considered preliminary until approved in writing by the USACE.

2.4 SURVEY METHODOLOGY

The jurisdictional determination work was completed by Mr. Jeffrey Meyer and Mr. Rick Jones on April 07 and April 08, 2008 for the study area. Weather conditions at the time of the delineation were mild with partly cloudy skies and daytime temperatures in the mid 50 degree Fahrenheit (°F) range.

EFR personnel were interviewed to obtain background information for the site, and documents describing the proposed project were reviewed. Satellite imagery, historic and current aerial photographs, National Resource Conservation Service (NRCS) soil maps, and topographic maps were reviewed prior to the field effort.

During previous and subsequent site visits, the perimeter and the interior portions of the property were traversed and areas of interest were flagged for further investigation. Each area of interest was surveyed for plant speciation, soils, and hydrology as per the USACE Wetland Delineation Manual (1987) and the Interim Regional Supplement: Arid West Region (2007). Trimble GeoXT GPS equipment was used to define the perimeter of the areas containing hydrophytic vegetation, hydric soils, wetland hydrology, and/or features characteristic of WoUS.

This jurisdictional determination was conducted in accordance with the USACE Jurisdictional Determination Form Instructional Guidebook and employing the USACE Review of Ordinary High Water Mark Indicators for Delineating Arid Streams in the Southwestern United States (Lichvar and Wakeley 2004). The USACE methodology has two standards, one for areas of open water such as streams, rivers, ponds, and lakes, and a second for wetlands.

Linear drainage features within the study areas were assessed based on the OHWM. The OHWM is the width measured between two adjacent banks at the normal level of water flow. Linear drainage features occurring within the project area that exhibited clearly defined bed, bank, and scour were evaluated for hydrologic connectivity to WoUS and subsequently mapped (Figure 5). Additionally, the linear drainage courses within the study area were classified as ephemeral, intermittent, or perennial based on the amount and duration of free-flowing surface water within the drainage course. Because human impact and other unnatural disturbances can have a significant impact on natural hydrologic patterns and the duration of surface water flow, it is often difficult to differentiate between ephemeral and intermittent courses. Definitions for each drainage feature class are as follows:

- Ephemeral - A stream channel that carries water only during, and immediately after, heavy rainfall and snowmelt, but ceases to flow shortly after available water supply from the precipitation event ceases.
- Intermittent - A stream channel that carries water only during, and immediately after, heavy rainfall and snowmelt, or defined as a stream that carries water a considerable portion of the time, but ceases to flow occasionally or seasonally because bed seepage and evapo-transpiration exceed the available water supply (base flow).
- Perennial - A stream that contains water at all times except during extreme drought.

The wetland delineation was conducted in accordance with the USACE Wetlands Delineation Manual (1987) and the Arid West Supplement (January 2007). The wetland delineation effort consisted of the Routine, Small Area Determination Method, as described in the Manual (1987), and by the evaluation sample plots for wetland or non-wetland status. Visual observations were used to identify vegetation, soil, and hydrological characteristics within the vicinity of the sample plots.

Plant community types in proximity to potential jurisdictional wetlands were identified to establish approximate boundaries between wetland and non-wetland environments.

The project biologists selected a representative observation point for each plant community, visually selected the dominant species from each stratum of that community, and recorded the wetland indicator status of the dominant species. A determination was then made as to whether the vegetation was capable of sustained growth in saturated or inundated environments, technically referred to as hydrophytic vegetation.

Hydrophytic vegetation dominates areas where the frequency and duration of inundation or soil saturation exerts a controlling influence on the plant species present. Plant species are assigned wetland indicator status according to the probability of a particular species occurring in wetlands. These indicators are published by FWS. According to the USACE (Environmental Laboratory, 1987), more than fifty percent of the dominant species must be hydrophytic to meet the wetland vegetation criterion. Hydrophytic plant indicator status designations conform to the following:

- Obligate Wetland Plants (OBL) – Plants that occur almost always (estimated probability greater than 99 percent) in wetlands under natural conditions, but may also occur rarely (estimated probability less than 1 percent) in non-wetlands.
- Facultative Wetland Plants (FACW) – Plants that occur usually (estimated probability is greater than 67 percent to 99 percent) in wetlands under natural conditions, but also occur (estimated probability is 1 percent to 33 percent) in non-wetlands.
- Facultative Plants (FAC) – Plants with a similar likelihood (estimated probability is between 33 to 67 percent) of occurring in both wetlands and non-wetlands.
- Facultative Upland Plants (FACU) – Plants that occur sometimes (estimated probability 1 percent to less than 33 percent) in wetlands, but occur more often (estimated probability is greater than 67 percent to 99 percent) in non-wetlands.
- Obligate Upland Plants (UPL) - Plants that occur rarely (estimated probability less than 1 percent) in wetlands, but almost always occur (estimated probability is greater than 99 percent) in non-wetlands under natural conditions.

Soils at sample plots within the potential wetlands were evaluated by digging soil pits. Munsell Soil Color Charts (MacBeth, 2000) were used to evaluate the color, hue, and chroma of representative soils and oxygen reduction reactions (redox) features associated with anaerobic conditions. Redox features were also characterized by their size, distinction, and frequency of occurrence.

The soil conditions were measured against the *Field Indicators of Hydric Soils in the U.S. v. 6.0* (WTI 2006). The results of the soil conditions were recorded on field data forms. Soil reducing conditions were recorded if they exhibited the presence of

oxidized root channels, mottling, or anaerobic soil conditions commonly referred to as gley soils. Also noted were other hydrological indicators such as soil saturation within the upper 12 inches of the soil, standing water within the soil pits, and the depth to saturated soil.

3. WETLAND ASSESSMENT

3.1 BACKGROUND INFORMATION

3.1.1 Study Area Description and Observed Field Conditions

The study area elevation ranged from approximately 5,400 to 5,900 feet above MSL. The study area is comprised of unmanaged native and non-native vegetation on land eventually discharging into the East Paradox Creek at a location approximately three miles to the northwest. The land surrounding the study area includes mixed rural land, public land, private and commercial mining operations.

One potentially jurisdictional wetland feature was observed within the study area and was identified as a retention pond that has historically been used to water cattle (Appendix A-1 Photograph 1, Figure 3). This shallow depression, located in the southern portion of the study area was dry at the time of previous field efforts in September, 2007 and inundated during the wetland determination in April, 2008. The retention pond is limited to the north by a 15 to 20 foot high man-made earthen berm and unconfined sheetflow is the primary source of sustained hydrology.

Using the Routine, Small Area Determination Method, two sample points were established on the southern edge of the inundated retention pond (Figure 3). SP1 (Appendix A-1 Photograph 2) was located approximately 20 inches south of the inundated area within the distinctly different vegetation as represented by sunflowers (*Helianthus annuus*), and common cocklebur (*Xanthium strumarium*). SP2 (Appendix A-1 Photograph 4) was located approximately 12 feet south of SP1 within the apparent upland vegetation which represented the majority of the study area.

3.1.2 The Study Area's Relevance to Commerce

The potential wetland and other WoUS on-site have no known use related to commerce. No current commercial activity occurring on-site is related to potential USACE jurisdictional features.

3.2 HYDROLOGY

3.2.1 Wetland Hydrology

Wetland hydrology is defined as inundation or soil saturation with a frequency and duration long enough during the growing season to cause the development of hydric soils and plant communities dominated by hydrophytic vegetation. Assessment of wetland hydrology is frequently supported and based on soil surveys, obvious topographic patterns of drainage, and impoundment.

3.2.2 Description of Study Area Hydrographic Variables

Hydrology of the study area is influenced by direct precipitation and sheetflow surface runoff from surrounding areas to the southwest. The mean annual precipitation for Montrose County is approximately 9.74 inches (NRCS 2008). The majority of this precipitation occurs as rain within a six-month period between the months of May and October. The precipitation in the six-month period between November and April comes primarily as snow. The average snowfall for Montrose County is 12.4 inches. The mean annual temperature is 49.3°F. The frost-free season is May through October, or 156 days. This investigation of the study area was conducted outside of the typical, active growing season.

3.2.3 Conclusions about Study Area Hydrology

Only one feature within the study area, identified as SP1, was determined to exhibit the hydrologic criteria necessary for classification as a wetland. SP1 (Appendix A-1 Photograph 2) met the wetland hydrology criterion due to the presence of Surface Water (A1), Surface Soil Cracks (B6), Inundation Visible on Aerial Imagery (B7), and Water-Stained Leaves (B9). SP2 (Appendix A-1 Photograph 4), was not observed to have the presence of wetland hydrology indicators. Seasonal precipitation and snowmelt appears to collect at low places in the study area, where it either infiltrates or is removed through evapo-transpiration.

3.3 SOILS

3.3.1 Hydric Soils

Hydric soils are saturated or inundation for a sufficient duration during the growing season to develop anaerobic or reducing conditions that favor the growth and

regeneration of hydrophytic vegetation (Environmental Laboratory, 1987). Indicators of wetland soils include observations of inundation or saturation, dark (low chroma) soil colors, contrasting mottles (concentrations of oxidized minerals such as iron), or gleying, indicates anaerobic (reducing) conditions by imparting a blue-gray color to the soil. Additional supporting information includes documentation of a soil as hydric, or reference to wet conditions, in the NRCS soil survey. Often, localized hydric soil conditions are not documented due to their small size, erroneous mapping, or recent development of hydric conditions, and must be visually inspected to confirm hydric conditions.

3.3.2 Study Area Soil Types

Study area soils are listed by the NRCS as Barx, Begay, Milkim, Paradox, and Vananda (Figure 4). The majority of the soils (71.6 percent) are classified as fine sandy loam. The soils are derived from alluvium from the surrounding sandstone and shale bluffs to the north and south of the valley. Soils within the study area are well drained and the water capacity is variable between the different soil types. The water table is more than 80 inches below the ground surface. The site soil profile has little or no soil horizon in the upper 24 inches. According to NRCS, none of the soils within the study area are classified as hydric (USDA 2008).

3.3.3 Field Observations

The soils observed in the northern portion of the study area tended to be sandy loam to fine sandy loam with typical hues in the 5YR range. Observations of rain events and snow melt made it apparent that water takes some time to infiltrate past the first few inches. The soil appears to be dry under approximately six inches of saturated soil.

The SP1 soil profile consisted of the top four inches of clay loam with approximately 10 percent organic material (Appendix A-1 Photograph 3). The color of the top four inches was dark brown (7.5YR3/4). From four inches to 12 inches below ground surface (bgs), the profile changed to a sandy loam with a yellowish red color (5YR4/6). Based on the Munsell Soil Color Charts the soil was classified as non-hydric soil.

The SP2 profile consisted of the top two inches of loam with plates of clay that restrict water infiltration (strictures), and flake off at the touch (Appendix A-1 Photograph 4). The color of the top two inches was brown (7.5YR4/4). From two to twelve inches bgs, the profile changed to a sandy loam with a yellowish red color (5YR4/6). Based on the Munsell Soil Color Charts this soil was considered non-hydric.

3.3.4 Conclusions

The soils for SP1 and SP2 did not meet USACE jurisdictional standards for hydric soils. The two soil pits did not exhibit any observed Hydric Soil Indicators.

3.4 VEGETATION

3.4.1 Hydrophytic Vegetation

Hydrophytic vegetation dominates areas where the frequency and duration of inundation or soil saturation exerts a controlling influence on the plant species present. Plant species are assigned wetland indicator status according to the probability of species occurring in wetlands (Reed, 1988). More than fifty percent of the dominant species must be hydrophytic to meet the wetland vegetation criterion.

3.4.2 Existing Level of Disturbance

The observed conditions of the study areas indicate significant modification and disturbance of the historic native substrate and vegetation structure. The historic native structure would likely have been dominated by grassland and big sage habitat plants.

Kleinfelder observed signs of use for cattle operations throughout the study area. The impacted areas showed signs of stress by the invasion of noxious weeds. The site vegetation indicated that the historically expected vegetation structure is being extirpated by a successional advancement of non-native and native plants adapted to the study areas current substrate and hydrological conditions.

3.4.3 Study Area Vegetation

Four ecotones (areas where two distinctly different habitats converge) were observed. These ecotones included a Piñon-Juniper habitat along the southwest portion of the study area along the bluffs, an adjacent narrow strip of big sage habitat, a native grassland habitat to the northeast, and another big sage habitat which covers the northeast half of the study area.

Piñon-Juniper Habitat

Piñon-Juniper habitat extends over large areas in western Colorado (Tueller *et al.* 1979). In Colorado, there are approximately 5 million acres (2,000,000 ha) of piñon-

juniper habitat (Brown 1994). Seventy percent of Colorado's piñon-juniper woodland is in Physiographic Area 87, the Colorado Plateau.

Piñon-juniper habitat type is a cold-adapted evergreen woodland situated above desert or grassland vegetation and below mountain shrub and piñon-juniper zones (Pieper 1977; Little 1977); elevations range from 4,500-7,500 ft above MSL (1,400 to 2,300 m MSL) (Brown 1994). Colorado piñon or two-needle Piñon (*Pinus edulis*) occurs in the eastern two-thirds of the piñon pine range. Several species of juniper are dominant or co-dominant, including Rocky Mountain juniper (*Juniperus scopulorum*), Utah juniper (*J. osteosperma*), one-seed juniper (*J. monosperma*), alligator juniper (*J. deppeana*), California juniper (*J. californica*), and redberry juniper (*J. coahuilensis*).

The bluffs along the southwest portion of the study area were also represented by the following vegetation: piñon pine, one-seed juniper, single leaf ash (*Fraxinus anomala*), mountain mahogany (*Cercocarpus montanus*), cliff fendler-bush (*Fendlera rupicola*), Mormon tea (*Ephedra virdis* var. *virdis*), Utah serviceberry (*Amelanchier utahensis* var. *utahensis*), and various forbs and grasses.

Big Sage Habitat

In western Colorado, sagebrush is found at elevations of approximately 4,000-10,000 ft (1,200 to 3,050 m) above or at MSL. On moist sites, big sage may reach 10 ft (3 m) in height, but more typically it is less than 5 ft (1.5 m). Big sage (*Artemisia tridentata* ssp. *Wyomingensis*) exists in a variety of climatic conditions, including low-elevation semi desert habitats and moist, cool, mountainous areas. Sagebrush species common in Colorado include big sagebrush and mountain sagebrush (*Artemisia tridentata* ssp. *vaseyana*). Plants found in association with sagebrush habitats include rabbitbrush (*Ericameria nauseosa*), bitterbrush (*Purshia* spp.), snowberry (*Symphoricarpos albus*), mountain mahogany, piñon pine, juniper, and aspen (*Populus tremuloides*). Grasses, especially bunchgrasses, are common components of sagebrush habitats, including wheatgrass species (*Pseudoroegneria* spp.), junegrass (*Koeleria macrantha*), Arizona fescue (*Festuca arizonica*), and Idaho fescue (*F. idahoensis*).

The big sage habitat in the study area consisted of big sage, fourwing saltbush (*Atriplex canescens*), rabbitbrush, and various grasses including, but not limited to, bent-grass (*Agrostis palustris*), blue grama (*Bouteloua gracilis*), downy brome (*Bromus tectorum*), galleta-grass (*Hilaria jamesii*), and fox-tailed barley (*Hordeum jubatum*).

Grassland Habitat

Grasslands in Western Colorado are areas dominated by grasses and forbs, and have few or no trees. Grazing and roaming animals occur in abundance across these grasslands. Originally the grasses were perennial bunchgrasses but grazing has encouraged the increased growth of sod grasses on areas with deep soil and heavy to moderate rainfall. The bunchgrasses have been replaced by annual grasses in areas with low precipitation. In some areas with deep soils and well protected from erosion, bunchgrasses still cover large areas in association with a few shrubs and cacti. However, there are areas where grass cover has been reduced as a result of woody plant and cacti colonization (Paysen *et al.* 2000).

Within the grassland habitat, trees and large shrubs are largely absent. Seasonal drought, occasional fires, and grazing by large mammals often prevent woody shrubs and trees from becoming established. A few trees such as cottonwoods (*Populus deltoides*), oaks (*Quercus* spp.) and willows (*Salix* spp.) grow near rivers and streams, and hundreds of species of flowers grow among the grasses. The various species of grasses include bent-grass, blue grama, downy brome, galleta-grass, and fox-tailed barley. Flowers include asters (*Aster* spp.), blazing stars (*Liatris spicata*), sunflowers, clovers (*Trifolium* spp.), and plains wild indigo (*Baptisia bracteata*).

Interspersed throughout the grassland habitat on the study area were fox-tailed barley, bent-grass, downy brome, galleta-grass, prickly pear (*Opuntia* spp.), blue gramma, and herb sophia (*Descurainia sophia*).

Noxious Weeds

Noxious weeds in the study area were present due to disturbed habitat from cattle grazing during the winter and previous off-road vehicle activity. This vegetation includes Russian thistle (*Salsola iberica*), broom snakeweed (*Gutierrezia sarothrae*), and herb sophia.

3.4.4 Field Observations

Vegetation associated with SP1 contained FAC, and FACU species (Appendix A-1 Photographs 1 and 2). The dominant species observed are common cocklebur and sunflowers. Cockleburs are rated as a FAC by FWS Wetland Plant rating system. This suggests that this plant species is considered to occur in wetlands between 33 to 67 percent of the time by USACE rating system. Sunflowers are rated as a FACU by FWS Wetland Plant rating system. This suggests that this plant species is considered to

occur in wetlands between one (1) percent and 33 percent of the time by the USACE rating system. This is an indication that areas with these plants have a higher probability of not meeting the necessary hyrdophytic vegetation criteria for classification as a wetland.

Vegetation associated with SP2 contained only UPL species. The dominant species were fourwing saltbush, rabbitbrush, broom snakeweed, and diffuse knapweed (*Centaurea diffusa*). All four of the species identified at SP2 are rated as UPL plants by FWS Wetland Plant rating system. This suggests that this plant species is considered to occur in wetlands less than one (1) percent of the time by the USACE rating system. As a result, areas with these plants have a very low probability of meeting the necessary hyrdophytic vegetation criteria for classification as a wetland.

3.4.5 Conclusions

According to the 1987 USACE Wetland Delineation Manual more than 50 percent of the dominant species must be hydrophytic to meet the wetland vegetation criterion. Neither SP1 nor SP2 exhibited greater than 50 percent hydrophytic vegetation; therefore the retention pond in the southern portion of the study area does not meet the USACE standard for wetland vegetation.

Based on data collected in the field for one potential wetland area, the retention pond did not meet the three USACE criteria for a wetland. No other potential jurisdictional wetlands were observed in the study area. Completed wetland delineation forms for SP1 and SP2 are attached as Appendix B.

4. LINEAR DRAINAGE FEATURES

Linear drainage features or un-vegetated drainage channels within the study area may be classified as WoUS and regulated by the USACE. The linear drainage feature assessment was conducted in accordance with the USACE regulation (Title 33 CFR Sections 328 and 329).

4.1 POTENTIAL OTHER WATER OF THE U.S. IDENTIFIED IN THE STUDY AREA

The study area contained four linear stream features that were defined by OHWM and six canyon streams that were defined by rock bed and bank. These features were not observed to be associated with wetlands. The total areas of each of the linear features and canyon streams are discussed below.

Stream No. 1-1 (Figure 5) had a well defined bed and bank. The stream originated in the south central portion of the study area and discharged approximately 1,000 yards to the northwest. The stream's OHWM had a width ranging from 0.5 to 18 feet, with an average width of 4.4 feet. The stream had numerous locations where elevated flow levels had exceeded the OHWM and flowed into adjacent plant communities. Additionally, many of these areas were difficult to access due to dense vegetative debris from the previous year's growth of Russian thistle. The total length of stream No. 1-1 is approximately 1,000 yards and would not be considered a jurisdictional feature, upon confirmation by the USACE, due to its discontinuity of defined stream channel and surface flow.

Stream No. 1-2 (Figure 5) had a well defined bed and bank. It originated in the northwest portion of the study area and discharged outside of the property boundary. The stream's OHWM had a width ranging from 0.5 to 12 feet, with an average width of 5.3 feet and numerous locations where elevated flows exceeded the OHWM. Additionally, there were areas that were difficult to access due to dense vegetative debris from the previous year's growth of Russian thistle (Appendix A-2 Photograph 5). The total length of stream No. 1-2 is approximately 200 yards to the northwest corner of the study area and would be considered a jurisdictional feature upon confirmation by the USACE.

Stream No. 2 (Figure 5) was observed through a pedestrial survey, and an OHWM was not observed. Stream No. 2 was classified as a swale, and it is assumed that this feature would not be considered a jurisdictional WoUS upon confirmation by the USACE.

Stream No. 3 (Figure 5) had a well defined bed and bank. It originated in two separate locations in the central portion of the study area and discharged near the northeast corner of the property. The western branch of the stream's OHWM had a width ranging from 0.5 to 2 feet, with an average width of 0.90 feet (Appendix A-2 Photographs 6 and 7). The eastern branch of Stream No. 3 exhibited an OHWM ranging from 0.5 to 5 feet in width, with an average width of 1.8 feet. The western branch of Stream No. 3 is approximately 770 yards in length and the eastern branch is approximately 1,250 yards in length. This stream would not be considered a jurisdictional feature, upon confirmation by the USACE, due to its discontinuity of defined stream channel and surface flow.

Stream No. 4 (Figure 4) had a well defined bed and bank. It originated in the central portion of the study area and discharged outside of the eastern property boundary. The stream's OHWM width ranged from 0.5 to 18 feet with an average width of 3.4 feet. The total length of Stream No. 4 is approximately 910 yards, but only 530 yards are located within property boundaries (Appendix A-2 Photograph 8 and Appendix A-3 Photograph 9). This stream would not be considered a jurisdictional feature, upon confirmation by the USACE, due to its discontinuity of defined stream channel and surface flow.

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In addition to the aforementioned streams, six canyon streams (Streams 5, 6, 7a, 7b, 8, 9 and 10) were identified during field activities (Figure 5) and defined by rock bed and bank (Appendix A-3 Photographs 10 through 12). The seven canyon streams discharge into unconsolidated sheetflow and would not be considered jurisdictional features, upon confirmation by the USACE due to their discontinuity of defined stream channel and surface flow. The table below provides information on the seven canyon streams:

Table 1 Canyon Streams

Stream Number	Stream Detail	Stream Type
5	140 yards in length, maximum width 25 feet, minimum width 1 foot, average width 9.3 feet	Discontinuous ephemeral stream
6	120 yards in length, maximum width 3 feet, minimum width 1 foot, average width 1.7 feet	Discontinuous ephemeral stream
7a	260 yards in length, maximum width 18 feet, minimum width 1 foot, average width 7.2 feet	Discontinuous ephemeral stream
7b	(east arm) 200 yards in length, maximum width 10 feet, minimum width 3 feet, average width 5.4 feet	Discontinuous ephemeral stream
8	410 yards in length, maximum width 15 feet, minimum width 2 feet, average width 6.2 feet	Discontinuous ephemeral stream
9	280 yards in length, maximum width 7 feet, minimum width 2 feet, average width 4.2 feet	Discontinuous ephemeral stream
10	450 yards in length, maximum width 8 feet, minimum width 1 foot, average width 3.6 feet	Discontinuous ephemeral stream

4.1.1 Conclusions

Streams No. 1-1, 2, 3, 4, and the seven canyon streams 5, 6, 7a, 7b, 8, 9 and 10 were observed as discontinuous ephemeral streams in accordance with the *Review of Ordinary High Water Mark Indicators for Delineating Arid Streams in the Southwestern United States* (Lichvar and Wakeley 2004). Discontinuous ephemeral streams are streams that have a distinctive alternating pattern between erosional channels and depositional reaches. This pattern can be repeated multiple times along the stream (Figures 6). Since there is no connection to the erosional channels when the stream is in the depositional stage, the stream is not considered jurisdictional by the USACE.

Stream 1-2 extends past the study area boundary in the erosional channel stage of the discontinuous ephemeral stream. Kleinfelder performed a pedestrial survey of more than a mile off-site to confirm the connection down stream. Kleinfelder observed stream No. 1-2 was connected to East Paradox Creek, a Class 3 water system that is under jurisdiction of the USACE. Stream No. 1-2 would be considered a WoUS under the jurisdiction of the USACE.

4.2 PROJECT IMPACTS

Due to the location of the stream features and the proposed project design, the project is not expected to impact streams on-site. However, since Stream No. 1-2 has the characteristics of a jurisdictional feature defined by the USACE, impacts to this stream should be avoided. Impacts to the retention pond are not anticipated.

4.3 4.3 PERMITTING IMPLICATIONS AND MITIGATION MEASURES

Projects that cause the discharge of dredged or fill material into WoUS require permitting by the USACE. Actions affecting small areas of jurisdictional WoUS may qualify for a Nationwide Permit (NWP), provided conditions of the permit are met, such as avoiding impacts to threatened or endangered species or to important cultural sites. A Nationwide Permit, which generally involves projects that are impacting 0.5 acre or less, is usually processed within 45 days.

Projects that affect larger areas or do not meet the conditions of an NWP may require an Individual Permit. The process for obtaining an Individual Permit requires a detailed alternatives analysis and development of a comprehensive mitigation/monitoring plan. An Individual Permit must go through an agency and public comment period prior to approval and issuance of the permit, a process that typically takes 160 days or more.

In all possible cases, project design should attempt to reduce impacts to wetlands or other WoUS to the greatest extent practicable to ease permitting and to reduce the cost of mitigation. The USACE prefers on-site mitigation efforts, when applicable; however, off-site mitigation is often necessary. It is anticipated that a 404 Permit (or permit addendum) would be required prior to modification of Stream No. 1-2, should modification be necessary. Other permits (i.e. permits related to special status species, cultural resources, etc.) may also be required.

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