

**U.S. Department of the Interior  
Bureau of Land Management  
White River Field Office  
220 East Market Street  
Meeker, CO 81641**

## ENVIRONMENTAL ASSESSMENT

**NUMBER:** DOI-BLM-CO-110-2009-0035-EA

**CASEFILE/PROJECT NUMBER:** COC67991 (Bargath Pipeline)  
COC73180 (Bargath Water Lines)

Well Pad	Well	Lease Serial No.
41-1-298	411-6-298	COC62046
	342-1-298	COC62053
	542-1-298	COC62053
	432-1-298	COC60736
	441-1-298	COC62053

**PROJECT NAME:** Williams APDs (5) on Single Well Pad, Access and Pipeline

**LEGAL DESCRIPTION:** The legal location information for the proposed wells are provided in Table 1.

**Table 1. Proposed surface location for the well pad and associated wells.**

Well Pad	Well	T	R	Sec.	P.M.	Quarter Section
41-1-298	411-6-298	2 S	98 W	1	Colorado, 6 <sup>TH</sup> P.M.	NE¼NE¼
	342-1-298					
	542-1-298					
	432-1-298					
	441-1-298					

**APPLICANT:** Williams Production RMT Company

**ISSUES AND CONCERNS:** No specific issues or concerns have been noted.

### **DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES**

***Background/Introduction:*** Williams Production RMT Company (Operator) has submitted applications to construct one well pad, with associated access road and pipeline connection, within the Ryan Gulch area of the Piceance Basin on lands administered by the Bureau of Land

Management (BLM) White River Field Office (WRFO) in Rio Blanco County, Colorado (Figure 1). Site characteristics of the proposed well are summarized in Table 2.

**Proposed Action:** The Proposed Action includes constructing one well pad (see Table 3 for pad dimensions and total area disturbed) with associated access road and pipeline connection. The total area disturbed for well pad construction would be approximately **5.10** acres. The applicant would construct a total of 0.35 mile (1,826 feet) of road to access the proposed well location, which would disturb approximately 1.27 acres based on a requested right-of-way (ROW) width of 30 feet.

Pipeline connections for this well would have a total length of 0.62 mile (3,288 feet) and a requested ROW width of 60 feet (4.5 acres) for construction, with a permanent ROW width of 30 feet (2.36 acres). Total area disturbed including overburden to construct the well pad, access road, and pipeline ROW would be approximately 10.87 acres.

**Table 2. Site characteristics of the proposed well pad.**

Well Pad	Surface Owner	Dominant Vegetation	Elevation (ft)	Major Drainage
41-1-298	BLM	Pinyon-juniper woodland	6,576	Piceance Creek

**Table 3. Pad dimension and acres of new disturbance.**

Well Pad	Pad Disturbance Area <sup>a</sup> (Acres)	New Access Road Length (ft)	New Access Road ROW (ft)	New Access Disturbance Area (Acres)	Pipeline Length (ft)	Pipeline Disturbance Width (ft)	Pipeline Disturbance Area (Acres)
41-1-298	<b>5.10</b>	1,826	30	<b>1.27</b>	3,288	60	<b>4.5</b>
<b>Total Disturbed Acres</b>							<b>10.87</b>

<sup>a</sup> Estimate includes total acres disturbed for pad surface, overburden, and the production facilities pad.

The well access road and pipeline connection is as follows:

The proposed pipeline would commence at the well head in the NENE of Section 1, and travel southeast to connect with an existing pipeline along County Road (CR) 24. An access road would be constructed from CR 31 southwest to the proposed well pad site.

The access road and surface-disturbing activities would conform to standards outlined in the BLM Gold Book *Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development* (BLM 2006a) and BLM Manual 9113 (BLM 1985).

Cleared woodland fuels from the well pad would be stockpiled away from combustible structures and materials used during drilling. Cleared woodland fuels from the access road and pipeline ROWs would be placed back on the ROWs immediately following construction and seeding. Those fuels would be evenly scattered along the ROWs to avoid fuel jackpots. Topsoil would be stockpiled on the edge of the well pad for later reclamation use. Shredded vegetation material would be used for stabilization of the topsoil stockpile. All roadside and well location cut and fill

slopes would be revegetated immediately after construction with the seed mixture(s) specified in the Conditions of Approval.

All reserve pits would be designed and fenced to BLM specifications. These specifications would be provided to the Operator as part of the Conditions of Approval. Produced waste water could be confined to the pit for a period of 90 days after initial production. During the 90-day period the required waste analysis would be submitted for the Authorized Officer's (AO's) approval, pursuant to Onshore Oil and Gas Order No. 7 (NTL-2B). A permanent steel tank would be installed in the ground next to the production facilities to store produced water before final disposal.

The reserve pit would be allowed to evaporate, pumped out and disposed of, and then backfilled. The backfilling of the reserve pit would be done in such a manner that the mud and associated solids would be confined to the pit and not squeezed out and incorporated into the surface materials. There would be a minimum of 3 feet of cover (overburden) on the pit.

All remaining cuttings would be solidified and buried in place, or disposed of in an approved manner. The stockpiled ground cover would be evenly distributed over the disturbed areas. The recommended seed mixture(s) to be used on all disturbed areas would be determined by the WRFO. The dirt contractor would be provided with an approved copy of the surface use plan.

The Operator would construct a temporary lined pit to store frac water while completing the well. The frac pit would be reclaimed immediately following completion.

Chemical pesticides or any other control agent that represents a potential soil, air, or water pollutant would not be used for any purpose on public lands without express written authorization from the AO.

The Operator or his contractor would notify the WRFO 48 hours before starting reclamation work that involves earth-moving equipment and upon completion of restoration measures.

During the Environmental Assessment (EA) process for this area, cultural resource clearance inventories were submitted under separate cover by Grand River Institute. Threatened and endangered species surveys have been completed by SWCA Environmental Consultants (SWCA) for the proposed location.

**No Action Alternative:** Under the No Action Alternative, the application would be denied and the well pad, access road, and pipeline connection would not be constructed.

**ALTERNATIVES CONSIDERED BUT NOT CARRIED FORWARD:** None.

**NEED FOR THE ACTION:** To respond to request by applicant to exercise lease rights and develop potential hydrocarbon reserves.

**PLAN CONFORMANCE REVIEW:** The Proposed Action is subject to and has been reviewed for conformance with the following plan (43 Code of Federal Regulations [CFR] 1610.5, BLM 1617.3):

Name of Plan: White River Record of Decision and Approved Resource Management Plan (ROD/RMP).

Date Approved: July 1, 1997.

Decision Number/Page: Pages 2-5 through 2-6.

Decision Language: “Make federal oil and gas resources available for leasing and development in a manner that provides reasonable protection for other resource values.”

### **AFFECTED ENVIRONMENT / ENVIRONMENTAL CONSEQUENCES / MITIGATION MEASURES**

**STANDARDS FOR PUBLIC LAND HEALTH:** In January 1997, Colorado BLM approved the Standards for Public Land Health. These standards cover upland soils, riparian systems, plant and animal communities, threatened and endangered species, and water quality. Standards describe conditions needed to sustain public land health and relate to all uses of the public lands. Because a standard exists for these five categories, a finding must be made for each of them in an EA. These findings are presented in the specific elements listed below.

### **CRITICAL ELEMENTS**

#### **AIR QUALITY**

*Affected Environment:* The Project Area is sparsely populated and therefore has relatively few residential air emissions that primarily arise from small communities and ranches. Vehicle traffic in the area is increasing and affects air quality through exhaust emissions and dust (particulate matter) generated by driving on unpaved roads. Historically, there have been limited industrial facilities in the area, however, oil and gas development in the Piceance Basin is rapidly increasing.

Despite the increase in industrial emissions, overall air quality conditions in the Project Area are likely to be good due to effective atmospheric dispersion conditions and limited transport of air pollutants from outside the area. Background air pollutant concentration data have been compiled for EAs in the vicinity of the Project Area (BLM 2006b, 2006c). These data are considered to be the best available representation of background air pollutant concentrations near the Project Area and include impacts from existing sources both inside and outside the Project Area. The data show that maximum pollutant concentrations are likely well below state and federal standards for most pollutants. Maximum concentrations of ozone approaching the federal standard were observed.

The federal government established the National Ambient Air Quality Standards (NAAQS) under the Federal Clean Air Act (CAA) and its amendments for six criteria pollutants. These six criteria pollutants are carbon monoxide, ozone, sulfur dioxide, nitrogen dioxide, lead, and particulate matter. The federal government also authorizes local, state, and tribal air quality regulatory agencies to establish regulations that are more stringent than federal requirements. The State of Colorado has adopted the NAAQS but has also established a more stringent Colorado Ambient Air Quality Standards (CAAQS) standard for sulfur dioxide.

Although specific air quality monitoring data are not available for the Project Area, data have been recorded in the vicinity of the Project Area. The cities of Grand Junction (approximately 60 linear miles to the southwest), Steamboat Springs (approximately 80 linear miles to the northeast), and Parachute (approximately 35 linear miles to the south) contain air quality monitoring stations. All stations monitor for particulate matter (PM<sub>10</sub>); Grand Junction also monitors for carbon monoxide. The remaining criteria pollutants are not monitored on the Western Slope. These data are considered to be the best available representation of background air pollutant concentrations near the Project Area and include impacts from existing sources both inside and outside the Project Area. Monitoring data at Grand Junction, Steamboat Springs, and Parachute indicate that the area is in attainment, meaning that the ambient concentrations of criteria pollutants are less than the applicable air quality standards (NAAQS and CAAQS).

In addition to the NAAQS, the CAA and its amendments established the mandatory federal Prevention of Significant Deterioration (PSD) program to help protect attainment areas of the country (Class I and Class II areas) and established limits to visibility impairment for Class I areas. The PSD program is applied to national parks and wilderness areas greater than 10,000 acres in size.

In its amended form, the CAA identifies two different air quality areas that receive different levels of protection: Class I and Class II. With few stipulations, Class I areas generally include national parks, federally designated wilderness areas, national monuments, and other areas of special national significance. Class I designation warrants the highest level of protection, requiring more stringent protection from air pollution damage than Class II areas. For example, the Flat Tops Wilderness Area is the closest designated PSD Class I area, located approximately 25 miles east of the Project Area. Additionally Dinosaur National Monument is a designated PSD Class II area with Class I protection status for sulfur dioxide, and is located approximately 50 miles northwest of the Project Area.

Given the attainment status of the Project Area, it is designated as PSD Class II. New development projects in PSD areas that would be a major source of pollutants (defined as either 250 tons/year or 150 tons/year, depending on the source) require the demonstration of the Best Available Control Technology, an air quality analysis, an additional impacts analysis, and public involvement.

*Environmental Consequences of the Proposed Action:* Direct air quality impacts associated with the Proposed Action would likely occur. Impacts would result from the use of engines and turbines during construction and development. This machinery is usually powered

by diesel, which when combusted produces a variety of emissions. These emissions include particulates and gases such as nitrogen oxides, carbon monoxide, carbon dioxide, and various volatile organic compounds (VOCs). These gas emissions further contribute to visibility degradation, ozone levels, and additional particulate formation. Surface disturbance of the land, drilling activities, and increased vehicle traffic on unpaved roads would also directly increase fugitive dust and particulates. Short-term increases in non-criteria pollutants such as visibility, nitric oxide, air toxics, and total suspended particulates may also occur during construction and development activities.

According to the Colorado Department of Public Health and the Environment (CDPHE), nitrogen oxides, VOC, and fugitive dust emissions from the oil and gas industry are increasing and are relatively uncontrolled in Colorado due to their minor source status (CDPHE 2006a). Cumulative impacts from the Proposed Action would contribute to this trend. It is estimated that in Rio Blanco County, VOC contributions related to oil and gas development comprise 68 percent of anthropogenic emissions (CDPHE 2006a). The State of Colorado has recognized that the oil and gas sector is rapidly growing and is contributing to Colorado's air quality issues (CDPHE 2007a). To minimize the contribution of this industry, the State Air Quality Control Commission adopted more stringent oil and gas industry regulations in December 2006.

Other cumulative impacts would include an increase in disturbed area within the region, which unless mitigated, would expose bare soils and contribute to particulate matter in the air. The cumulative effects of an overall increase in these pollutants could also potentially lead to reduced visibility. Because the historic air quality has been good, small changes in air quality may have noticeable effects, especially on visibility. As air quality degrades, the ability to see the region's vistas and scenery may decrease.

*Environmental Consequences of the No Action Alternative:* There would be no additional impacts to air quality under the No Action Alternative.

*Mitigation:* All activities would be required to comply with all applicable local, state, and federal air quality laws, statutes, regulations, standards, and implementation plans. Documentation of this compliance would be provided to the BLM. Further mitigation of air quality impacts would also be required, including the following.

- All access roads would be maintained according to BLM Manual Section 9113 standards for road shape and drainage features at all times during construction, drilling, completion and production of the wells.
- All access roads would be treated with water and/or a dust suppressant during construction and drilling activities so that there is not a visible dust trail behind vehicles. All vehicles would abide by company or public speed restrictions during all activities. If water is used as a dust suppressant, there should be no traces of oil or solvents in water. Only water needed for abating dust should be applied; dust abatement should not be used as a water disposal option under any circumstances.
- Vehicle speeds would be limited on associated access roads to 15 miles per hour (mph), or another appropriate limit, and applying a BLM-approved dust suppressant during dry periods when dust plumes are visible.

- Land clearing, grading, earth moving, and excavation activities would be suspended when wind speed exceeds 20 mph or as needed to prevent dust plumes.

## CULTURAL RESOURCES

*Affected Environment:* The proposed well pad location has been inventoried at the Class III level (Conner and Davenport 2006, Compliance Dated 2/28/2007) with no new cultural resources identified in the inventoried area. One previously recorded site (5RB389) is located near the well pad but was not located in the area inventoried by Conner and Davenport (2006).

The area of the proposed access route and the well tie pipeline have been inventoried at the Class III (100% pedestrian) level (Schwendler et al 2008, Compliance Dated 2/11/2009) with one archaeological site identified along the proposed well tie pipeline route. The site is identified as a wickiup village site and is potentially eligible for nomination to the National Register of Historic Places (NRHP).

*Environmental Consequences of the Proposed Action:* The proposed well pad location and access would not impact any known significant cultural resources.

Mitigation measures should, if strictly adhered to, result in no new direct impacts to cultural resources. The wickiup village must be avoided by all construction. However there is the potential for increased unauthorized collection of the two sites identified in the project vicinity due to improved access into the area and increased activity and visitation in the area

*Environmental Consequences of the No Action Alternative:* There would be no new impacts to cultural resources under the No Action Alternative.

*Mitigation:* The Operator would be responsible for informing all persons associated with the project operations that they would be subject to prosecution for knowingly disturbing historic or archaeological sites, or for collecting artifacts.

If subsurface features are located during clearing of the well pad location, access road, or well tie in pipeline, all construction on the well pad would cease immediately. The AO (i.e., Field Manager or his/her acting manager) would be notified immediately. Within five working days the AO would inform the Operator as to:

- whether the subsurface features or materials found during construction appear eligible for the NRHP;
- the mitigation measures the Operator would likely have to undertake before the site can be used (assuming that in situ preservation is not necessary); and
- a timeframe for the AO to complete an expedited review under 36 CFR 800-11 to confirm, through the State Historic Preservation Officer, that the findings of the AO are correct and that the mitigation is appropriate.

At any time, if the Operator wishes to relocate the construction activities to avoid the expense of mitigation and/or the delays associated with the process, the AO would take on the responsibility of recording and/or stabilizing the exposed materials, if required. Mitigation technical guidelines and procedures would be provided by the AO. The Operator may resume construction once the AO has verified that mitigation is complete.

Pursuant to 43 CFR 10.4 (g) the holder of the authorization must notify the AO, by telephone or with written confirmation, immediately upon the discovery of human remains, funerary items, sacred objects, or objects of cultural patrimony. Pursuant to 43 CFR 10.4 (c) and (d), the Operator must stop activities in the vicinity of the discovery and protect it for 30 days or until notified to proceed by the AO.

## INVASIVE, NON-NATIVE SPECIES

*Affected Environment:* Noxious weeds are officially designated non-native plant species that are invasive and/or have the potential to become monocultures, and can cause harm to land value, native ecology, agricultural interests, wildlife habitat, livestock forage, riparian resources, and aesthetic and visual values of land.

The State of Colorado maintains an official state list of weed species that are designated noxious species. Weeds are prioritized on three lists (Classes A, B, and C) depending on noxious and invasive tendencies. Class A species are noxious weeds that have the potential to pose a significant threat to local economies, ecosystems, and habitats. Class A species currently are not present in the state or have a limited distribution. For Class A species, preventing invasions and eradicating existing infestations is the highest priority. Class B weeds are species that are limited to portions of the state. In areas with severe infestations, management plans should be designed to contain the infestation and prevent further spread. Class C weeds are species that are widespread throughout the state. Table 4 lists 20 noxious weeds present, or potentially present, in the Project Area. Of these, 19 species appear on the state noxious weed list (U.S. Department of Agriculture [USDA] 2003) and 19 species on the noxious weed list for Rio Blanco County (Colorado Department of Agriculture n.d.). Management decisions for these species should be determined at the local level based on feasibility of control and severity of infestation.

**Table 4. Noxious weed species potentially present in the Project Area.**

Common Name	Scientific Name	Colorado Noxious Weed List	Rio Blanco Noxious Weed List	Project Area Vicinity
Russian knapweed	<i>Acroptilon repens</i>	B	X	
Common burdock	<i>Arctium minus</i>	C	X	
Cheatgrass	<i>Bromus tectorum</i>	C		X
Hoary cress	<i>Cardia draba</i>	B	X	
Plumeless thistle	<i>Carduus acanthoides</i>	B	X	
Musk thistle	<i>Carduus nutans</i>	B	X	
Diffuse knapweed	<i>Centaurea diffusa</i>	B	X	
Spotted knapweed	<i>Centaurea maculosa</i>	B	X	
Black knapweed	<i>Centaurea nigra</i>		X	

Common Name	Scientific Name	Colorado Noxious Weed List	Rio Blanco Noxious Weed List	Project Area Vicinity
Canada thistle	<i>Cirsium arvense</i>	B	X	
Field bindweed	<i>Convolvus arvensis</i>	C	X	X
Houndstongue	<i>Cynoglossum officinale</i>	B	X	
Leafy spurge	<i>Euphorbia esula</i>	B	X	
Halogeton	<i>Halogeton glomeratus</i>	C	X	X
Black henbane	<i>Hyoscyamus niger</i>	B	X	
Perennial pepperweed	<i>Lepidium latifolium</i>	B	X	
Dalmatian toadflax	<i>Linaria dalmatica</i>	B	X	
Yellow toadflax	<i>Linaria vulgaris</i>	B	X	
Scotch thistle	<i>Onopordum acanthium</i>	B	X	
Common mullein	<i>Verbascum thapsus</i>	C	X	X

Invasive and non-native species observed in the Ryan Gulch area during an SWCA biological survey on 21 May 2007 include cheatgrass (*Bromus tectorum*), common mullein (*Verbascum thapsus*), field bindweed (*Convolvus arvensis*), and halogeton (*Halogeton glomeratus*). These species are Class C state-listed noxious weeds.

*Environmental Consequences of the Proposed Action:* Approximately 10.87 acres of vegetation would be disturbed in conjunction with the construction of the well pad, pipeline, and access road. Where soils are disturbed and native vegetation is lost, the likelihood for non-native or invasive species to be introduced and become established is increased. Direct impacts to vegetation from weed infestations in the Project Area may include reduced structural and species diversity, loss of wildlife habitat, and loss of rangeland productivity. Indirect impacts resulting from weed infestations in the Project Area would include changes in the fire cycle and increased economic costs from weed management efforts.

*Environmental Consequences of the No Action Alternative:* Under the No Action Alternative there would be no additional impacts to vegetation from noxious weeds within the Project Area. However, the No Action Alternative may allow present populations of noxious weeds to persist or increase as no additional weed monitoring or management efforts would occur.

*Mitigation:* The Operator would be required to monitor the Project Area for the life of the project and eradicate all noxious weeds and cheatgrass which occurs onsite for the life of the project using materials and methods approved in advance by the AO.

As the Project Area would occur in a BLM-dedicated Weed-Free Zone, the Operator would conduct all surface activities in accordance with the BLM Manual 9015 - *Integrated Weed Management* (BLM 1992) and the BLM *White River Resource Management Plan*, Appendix B, Management of Noxious Weeds (BLM 1997a). Materials and methods must be approved in advance by the AO. Specific mitigation measures include the following:

- Conduct pre-construction surveys for noxious weed infestations within the site boundaries and along access roads. Surveys should be conducted in the spring.

- Consult with BLM to determine treatment for noxious weeds, if identified.
- Construction vehicles and equipment would be cleaned, power-washed, and free of soil and vegetation debris prior to entry and use of access roads to prevent transporting weed seeds.
- All seed mixture, erosion control materials, and reclamation materials would be certified weed-free.
- Revegetated areas would be monitored for at least 3 years following seeding to evaluate the need for supplemental seeding and noxious weed control.
- The ROW and other disturbed areas would be monitored for noxious weed infestations, and new or expanding populations would be controlled or eradicated for the duration of the construction, operation, and reclamation phases.
- The presence of Class C weeds in the Project Area requires that the Operator develop and implement management measures to prevent the spread of noxious weeds and install a monitoring system for a minimum of 3 years.

## MIGRATORY BIRDS

*Affected Environment:* The Migratory Bird Treaty Act (MBTA) provides for the protection of migratory birds, including their nests and eggs. A variety of birds protected by the MBTA that use pinyon-juniper woodland and/or sagebrush habitats may be present and nesting in or near the Project Area during spring and summer months. In 2002, the U.S. Fish and Wildlife Service (USFWS) Division of Migratory Bird Management identified priority bird species at varying geographic levels, including Bird Conservation Regions (BCRs) used by the North American Bird Conservation Initiative (NABCI) (USFWS 2002). The NABCI defines BCRs as “ecologically distinct regions in North America with similar bird communities, habitats, and resource management issues” (NABCI 2008). The Project Area falls within the boundaries of BCR 16 (Southern Rockies/Colorado Plateau), which encompasses large portions of northern Arizona, western Colorado, northwestern New Mexico, and eastern Utah (NABCI 2008). Therefore, the 29 bird species listed for BCR 16 were considered for species of concern potentially present within the Project Area. Since BCR 16 is comprised largely of portions of other states, only those species whose ranges include western Colorado (Andrews and Righter 1992; Kingery 1998; Righter et al. 2004) were considered for analysis. This list was further reduced to those species characteristic of the pinyon-juniper woodland, sagebrush, and montane shrubland habitats in the Project Area. The Project Area list of potentially occurring priority species includes northern harrier (*Circus cyaneus*), Swainson’s hawk (*Buteo swainsoni*), golden eagle (*Aquila chrysaetos*), peregrine falcon (*Falco peregrinus*), prairie falcon (*F. mexicanus*), Wilson’s phalarope (*Phalaropus tricolor*), burrowing owl (*Athene cunicularia*), gray vireo (*Vireo vicinior*), pinyon jay (*Gymnorhinus cyanocephalus*), Virginia’s warbler (*Vermivora virginiae*), black-throated gray warbler (*Dendroica nigrescens*), and sage sparrow (*Amphispiza belli*).

Migratory bird species noted during SWCA biological surveys in summer 2008 (SWCA 2008) in the Ryan Gulch region included turkey vulture (*Cathartes aura*), mourning dove (*Zenaida macroura*), broad-tailed hummingbird (*Selasphorus platycercus*), ash-throated flycatcher (*Myiarchus cinerascens*), violet-green swallow (*Tachycineta thalassina*), hermit thrush

(*Catharus guttatus*), American robin (*Turdus migratorius*), chipping sparrow (*Spizella passerina*), and brown-headed cowbird (*Molothrus ater*). Additionally, one active Cooper's hawk (*Accipiter cooperi*) nest, one active American kestrel (*F. sparverius*) nest, and two inactive nests, including one identified as a golden eagle nest, were found within 0.5 mile of the Project Area (SWCA 2008). Red-tailed hawk (*B. jamaicensis*) and long-eared owl (*Asio otus*) nests were also observed during the 2008 surveys in the greater Ryan Gulch area. SWCA (2008) provides a full list of bird species detected in the greater Ryan Gulch area.

*Environmental Consequences of the Proposed Action:* Disturbance of vegetation has the potential to impact individual migratory birds or their nests. Under the Proposed Action, approximately 10.87 acres of vegetation would be disturbed, reducing the extent of pinyon-juniper and sagebrush habitats in the area. However, it is unlikely the Proposed Action would have a measurable influence on the abundance or distribution of breeding migratory birds since sagebrush and pinyon-juniper are generally abundant in the area, and the vegetation removed would represent a small portion of the habitat available for birds.

Noise and human presence could temporarily disrupt the courting or nesting of birds in or adjacent to the Project Area. Raptors are easily disturbed during breeding, nesting, and fledging periods and may abandon nests due to disturbance. Birds displaced by temporary activities would relocate to adjacent suitable habitat; therefore, no long-term impacts would occur.

The development of a reserve pit in the Project Area may attract waterfowl and other migratory birds for purposes of resting, foraging, or as a source of free water. Mortality events that include migratory waterfowl (e.g., several teal species) contacting oil-based drilling fluids stored in reserve pits during or after completion operations have been documented in the WRFO Resource Area, and these events constitute a violation of the MBTA. The extent and nature of the problem is not well-defined, and until vectors of mortality are better understood, management measures must be conservative and directed at preventing bird contact with produced water and drilling and completion fluids which may pose a risk (i.e., acute or chronic toxicity, compromised insulation) to these species.

*Environmental Consequences of the No Action Alternative:* There would be no affect on migratory birds or their habitats under the No Action Alternative.

*Mitigation:* Reserve pits should be appropriately designed, as shown in the BLM Gold Book *Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development* (BLM 2006a) to prevent access by persons, wildlife, or livestock. Fencing, netting, or other methods may be required in order to prevent access and mortality of birds and other animals.

The Operator would be responsible for implementing mitigation measures that minimize bird injuries or mortality as a result of contact with produced water or other toxic substances in the reserve pit. The most effective measure currently being used includes the use of netting to cover the pit. The use of plastic balls that float on the surface and reduce the area that might be perceived by waterfowl as a place to rest and/or forage has also been used in certain circumstances, with limited results. The use of plastic flagging has proven to be ineffective at

detering use by migratory waterfowl for foraging, resting or as a source of free water, and its use is strongly discouraged. The Operator would notify WRFO Natural Resource Specialist, Brett Smithers via Email (brett\_smithers@blm.gov) or by phone ([970] 878-3818) of the method that would be used to prevent impacts to birds two weeks prior to the date when completion activities are expected to begin. In addition, the Operator would submit a Sundry Notice describing the proposed method used to deter use of migratory birds. The BLM-approved method would be applied within 24 hours after completion activities have begun. All lethal and non-lethal events that involve migratory birds would be reported to the Petroleum Engineer Technician immediately.

If future raptor inventory surveys document the occurrence of one or more breeding pairs of BLM non-sensitive raptors nesting within the project area, future soil-disturbing activities, drilling, well completion, workover and reclamation activities associated with this action would be subject to the White River ROD/RMP-approved No Surface Occupancy stipulation NSO-03, which disallows surface occupancy within 1/8 mile of identified active nests and nests that are in good condition. In addition, disruptive activity (i.e., surface disturbing, and drilling and completion-related activities) would be disallowed within 0.25 mile of listed and BLM-sensitive species raptor nests from February 1 through August 15.

**THREATENED, ENDANGERED, AND SENSITIVE ANIMAL SPECIES** (includes a finding on Standard 4)

*Affected Environment:* The USFWS (2008) lists seven animal species found in Rio Blanco County as threatened, endangered, or candidate under the Endangered Species Act (ESA) (Table 5). In addition, the WRFO lists 20 species as sensitive (Table 6) (BLM 2000). Bald eagle is also included in Table 6 due to its recent federal delisting under the ESA (USFWS 2007a, 2007b).

**Table 5. Federally listed and candidate species for Rio Blanco County, Colorado.**

Species	Scientific Name	Status	Habitat
Black-footed ferret	<i>Mustela nigripes</i>	E	Open grasslands, steppe, and shrub steppe containing extensive prairie dog towns
Bonytail	<i>Gila elegans</i>	E	Colorado River system
Canada lynx	<i>Lynx canadensis</i>	T	Montane coniferous forests
Colorado pikeminnow	<i>Ptychocheilus lucius</i>	E	Colorado River system
Humpback chub	<i>Gila cypha</i>	E	Colorado River system
Razorback sucker	<i>Xyrauchen texanus</i>	E	Colorado River system
Yellow-billed cuckoo WDPS <sup>1</sup>	<i>Coccyzus americanus</i>	C	Large, unfragmented riparian areas

T = Threatened, E = Endangered, C = Candidate

<sup>1</sup> In 2001, the USFWS found that listing of the Western United States Distinct Population Segment (WDPS) of yellow-billed cuckoo was warranted but precluded by higher priority listing activities (USFWS 2007c).

**Table 6. BLM-sensitive animal species for the WRFO.**

Species	Scientific Name	Habitat within Project Area?
Townsend's big-eared bat	<i>Corynorhinus townsendii</i>	Yes

Species	Scientific Name	Habitat within Project Area?
Fringed myotis	<i>Myotis thysanodes</i>	Yes
Yuma myotis	<i>Myotis yumanensis</i>	Yes
Barrow's goldeneye	<i>Bucephala islandica</i>	No
Greater sage-grouse	<i>Centrocercus urophasianus</i>	Yes
White-faced ibis	<i>Plegadis chihi</i>	No
Northern goshawk	<i>Accipiter gentilis</i>	Yes
Ferruginous hawk	<i>Buteo regalis</i>	No
Bald eagle	<i>Haliaeetus leucocephalus</i>	Yes
Mountain plover	<i>Charadrius montanus</i>	No
Long-billed curlew	<i>Numenius americanus</i>	No
Black tern	<i>Chlidonias niger</i>	No
Midget faded rattlesnake	<i>Crotalus viridis concolor</i>	Yes
Northern leopard frog	<i>Rana pipiens</i>	Yes
Great Basin spadefoot	<i>Spea intermontana</i>	Yes
Bluehead sucker	<i>Catostomus discobolus</i>	No
Flannelmouth sucker	<i>Catostomas latipinnis</i>	No
Mountain sucker	<i>Catostomas platyrhynchus</i>	No
Plains topminnow	<i>Fundulus sciadicus</i>	No
Roundtail chub	<i>Gila robusta</i>	No
Colorado River cutthroat trout	<i>Oncorhynchus clarki pleuriticus</i>	No

No federally listed species are expected to occur in the Project Area due to lack of suitable habitat. The Project Area contains minimal suitable nesting habitat for sensitive raptor species. BLM-sensitive raptor and bat species typically use mature stands of pinyon-juniper with well-developed forest canopies and large-diameter trees that offer nesting, foraging, and roosting habitat. The Project Area is primarily mid-age pinyon-juniper with an open canopy and sagebrush. However, fragmented stands of mature and old-growth forest with potential to support sensitive raptors or bats are scattered throughout the Project Area. No sensitive raptor nest was observed during biological surveys.

Location 41-1-298 and various sections of the proposed pipeline route and sections of access road to be constructed would include the removal of mature stands of pinyon-juniper. These mature stands include well developed forest canopies and large diameter trees that offer nesting and foraging habitat for northern goshawk, and roosting habitat for three species of bats (e.g., fringed and Yuma myotis, and Thompson's big-eared bat). Roosts and hibernacula of these BLM-sensitive bat species are generally associated with caves, buildings, and underground mines; woodland roost sites offer limited day roost habitat during the spring, summer and fall months. There is some evidence that suggests that bat roost trees may be more often situated within the interior of stands rather than on the stand margins. Areas potentially influenced by the proposed action were surveyed for woodland raptor nesting activity by environmental consultants during the 2008 breeding season. No BLM-sensitive raptor species were documented.

Northern goshawk nesting habitat in the Piceance Basin can generally be described as contiguous stands of large diameter, mature to old-growth pinyon-juniper. Often, these sites are located on north to northwest facing slopes where conditions are generally more mesic. Suitable nesting habitat is also most often found mid-slope, or in the bottom of drainages with suitable nesting

According to the Colorado Division of Wildlife (CDOW) data (2008), one historic greater sage-grouse lek (where viable populations have not occurred in five years or more) is located northwest of the Project Area; however, the proposed well falls outside the buffer of this historic lek. A sage-grouse brooding and production area is located near Little Corral Gulch, east of Piceance Creek. This lek was active in 2007 (Ed Hollowed, BLM, pers. comm. with Larry Semo, SWCA, June 2007). Four additional leks are located south of Box Elder Gulch, just east of the Cathedral Bluffs and west of the Project Area. The Proposed Action would not impact any of these active sage-grouse leks.

CDOW (2008) mapped Piceance Creek as bald eagle winter range and winter foraging habitat, and the eagle may occur in or near the Project Area seasonally. The nearest known summer range and nesting habitat for bald eagles is located along the White River, north of the Project Area. No bald eagles were observed in the Ryan Gulch area during summer 2008 raptor surveys (SWCA 2008).

The midget faded rattlesnake (*Crotalus viridis concolor*), a diminutive subspecies of the prairie (western) rattlesnake (*C. viridis*), is known to occur in northwestern Colorado across varied habitats, including pinyon-juniper woodland and shrubland (Hammerson 1999). It is difficult to differentiate some individuals of the BLM-sensitive subspecies from individuals of other races of the species. Hammerson (1999) concluded that Rio Blanco County apparently constitutes an area of intergradation between subspecies *concolor* and the more common subspecies *viridis*. The midget faded subspecies is potentially present; although, there have been no known observations within the Project Area or vicinity. During wildlife surveys in the greater Ryan Gulch area in summer 2008, SWCA biologists photographed the only rattlesnake detected (SWCA 2008). This individual snake was boldly patterned, a characteristic more typical of subspecies *viridis* than the generally unpatterned BLM-sensitive subspecies *concolor* (Hammerson 1999).

The northern leopard frog (*Rana pipiens*) is known to occur in Piceance Creek. Leopard frogs are associated with wet meadows and the banks and shallows of marshes, ponds, streams, and irrigation ditches (Hammerson 1999). This species has the potential to occur in the Project Area within wetland areas associated with Ryan Gulch.

In Colorado, the Great Basin spadefoot (*Spea intermontana*) inhabits dry rocky slopes, broad dry basins, floodplains, and canyons below 7,000 feet elevation and vegetated by pinyon-juniper woodland, sagebrush, saltbrush, or semi-desert shrublands (CDOW 2008; Colorado Natural Heritage Program [CNHP] 2008). CNHP records indicate known spadefoot habitat south of the Project Area, at the confluence of Black Sulphur and Piceance creeks, and to the northeast of the Project Area.

Fishes listed as sensitive by the WRFO that are present in Piceance Creek include the flannelmouth sucker (*Catostomus latipinnis*) and mountain sucker (*Catostomus platyrhynchus*) (Canton n.d.). WRFO and CDOW surveys in February 2007 noted mountain suckers in Fawn Creek south of the Project Area. Colorado River cutthroat trout (*Oncorhynchus clarki pleuriticus*) were observed in Piceance Creek in 2006 southeast of the Project Area near Sprague Gulch, but the species does not occur regularly in Piceance Creek.

*Environmental Consequences of the Proposed Action:* Land disturbance resulting from the Proposed Action would not be expected to result in direct, long-term adverse effects to federally listed or BLM-sensitive animal species. Construction activities may create temporary disturbance to individuals in the Project Area; however, the Proposed Action would be unlikely to cause a trend toward federal listing or a loss of viability of any species.

Considering the nearly 250,000 acres of pinyon-juniper woodland in Piceance Basin, the direct removal of approximately 10.7 acres of mature pinyon-juniper is unlikely to have any measurable influence on the availability of bat roost substrate or the suitability of stands for bat roosting activity. Indirect impacts to woodland raptor and bat populations as a result of cumulative removal of mature pinyon-juniper woodlands throughout the Piceance Basin as a result of increased oil and gas activity and the construction of well pads, access roads, pipelines and other ancillary facilities is unknown.

*Environmental Consequences of the No Action Alternative:* No immediate action would be authorized that would involve the adverse modification of Pinion-juniper or sagebrush habitat. Alternate pad locations would likely be situated at more distant locations from developed roads, involving more extensive access needs and more extensive direct and indirect loss of BLM-sensitive raptor nesting habitat.

*Mitigation:* If future raptor inventory surveys document the occurrence of one or more breeding pairs of BLM-sensitive raptors nesting within the project area, future soil-disturbing activities, drilling, well completion, workover and reclamation activities associated with this action would be subject to the White River ROD/RMP-approved No Surface Occupancy stipulation NSO-02, which disallows surface occupancy within 0.25 mile of identified functional nests. In addition, disruptive activity (i.e., surface disturbing, and drilling and completion-related activities) would be disallowed within 0.5 mile of listed and BLM-sensitive species raptor nests from February 1 through August 15 (TL-01).

*Finding on the Public Land Health Standard for Threatened and Endangered Species:* Standard 4 of the BLM Standards for Public Land Health and Guidelines for Livestock Grazing Management in Colorado states that special status plants and animals and their habitats should be maintained or enhanced to sustain public land health. The Proposed Action would have no effect on the land health standard with implementation of mitigation measures.

**THREATENED, ENDANGERED, AND SENSITIVE PLANT SPECIES** (includes a finding on Standard 4)

*Affected Environment:* The vegetation in the Project Area primarily consists of mid-age pinyon pine (*Pinus edulis*) and one-seed juniper (*Juniperus monosperma*) woodland and intermountain basins big sagebrush (*Artemisia tridentata* ssp. *tridentata*). Special status plant species (SSS) with known populations in the Piceance Basin all depend upon barren shale exposures of the Green River Formation (Table 7). A special status plant survey and habitat assessment was conducted during the SWCA biological surveys on 21 May 2007. The results of the survey found neither special status plant populations or suitable habitat for any of these SSS in the Project

Area. The Ryan Gulch ACEC is approximately one-half mile east and does contain special status plant species and their habitat; however, no direct or indirect effects are expected.

**Table 7. Special status plant species with known populations in the Piceance Basin.**

Common Name	Scientific Name	Status
Debris milkvetch	<i>Astragalus detritalis</i>	BLM Sensitive
Park rockcress	<i>Boechera fernaldiana</i> ( <i>Arabis vivariensis</i> )	BLM Sensitive
Ephedra buckwheat	<i>Eriogonum ephedroides</i>	BLM Sensitive
Utah gentian	<i>Gentianella tortuosa</i>	BLM Sensitive
Narrow-stem gilia	<i>Gilia stenothyrsa</i>	BLM Sensitive
Dudley Bluffs bladderpod	<i>Lesquerella congesta</i>	USFWS Threatened
Piceance bladderpod	<i>Lesquerella parviflora</i>	BLM Sensitive
Narrow-leaf evening primrose	<i>Oenothera acutissima</i>	BLM Sensitive
Rollins cryptanth	<i>Oreocarya</i> ( <i>Cryptantha</i> ) <i>rollinsii</i>	BLM Sensitive
Graham beardtongue	<i>Penstemon grahamii</i>	USFWS Candidate
White River beardtongue	<i>Penstemon scariosus</i> var. <i>albifluvis</i>	USFWS Candidate
Piceance twinpod	<i>Physaria obcordata</i>	USFWS Threatened

Source: Spackman et al. 1997

*Environmental Consequences of the Proposed Action:* Because no special status plant species or suitable habitat was found within the Project Area, there would be no direct impacts to plant populations or habitat.

*Environmental Consequences of the No Action Alternative:* There would be no effect on threatened, endangered, or sensitive plant species under the No Action Alternative.

*Mitigation:* None.

*Finding on the Public Land Health Standard for Threatened and Endangered Species:* Standard 4 of the *BLM Standards for Public Land Health and Guidelines for Livestock Grazing Management in Colorado* states that special status plants and animals and their habitats should be maintained or enhanced to sustain public land health. The Proposed Action would have no effect on the land health standard.

## WASTES, HAZARDOUS OR SOLID

*Affected Environment:* As defined by the BLM, hazardous materials are any substance, pollutant, or contaminant that is listed as hazardous under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980. The term does not include petroleum products, crude oil, or natural gas.

Natural resources that could potentially be affected by hazardous materials associated with the Proposed Action include air, water, soil, and biological resources. These resources could be exposed by an accidental release of hazardous materials during the storage, transport, or use of hazardous materials in association with construction, operations, or maintenance at the proposed site.

No hazardous materials or other solid wastes are known to have been used, stored, or disposed of, or otherwise exist within the Project Area. However, a variety of materials, including lubricants, treatment chemicals, gasoline, oil, and diesel fuels would be used to construct and operate the proposed well pad with associated access road and pipeline connection. Potentially harmful substances used in the construction and operation would be kept on-site in limited quantities, and trucked to and from the site as required.

Most waste generated would be exempt from hazardous waste regulations under the exploration and production exemption of the Resource Conservation and Recovery Act. Examples of exempt wastes include process water and hydrocarbon impacted soils. No hazardous substance, as defined by 40 CFR 355, in amounts above the threshold quantities, would be used, produced, stored, transported, or disposed of.

Solid waste includes, but is not limited to, human waste, trash, garbage, ashes, welding rods, etc. Solid waste would be generated during construction activities and during operation of the proposed well.

*Environmental Consequences of the Proposed Action:* During construction and operation, a variety of by-products and waste materials would be generated. They include construction waste, drill hole cuttings, garbage, and miscellaneous solid and sanitary wastes. With the proper procedures in place, it is anticipated that waste would not present any environmental consequences, especially if materials are collected in appropriate containers and recycled or disposed off site in accordance with applicable regulations.

During construction and operation of the Proposed Action, accidental spills or leaks associated with equipment failures, refueling and maintenance of equipment, and storage of fuels, oil, or other fluids could cause soil and surface and/or ground water contamination. The severity of potential impacts from accidental material spills would depend upon the chemical released, the quantity released, and the proximity of the release to a water body or aquifer.

The Proposed Action would increase contributions to solid waste landfills. Trash in the Project Area that is not properly disposed of could be blown off-site into adjacent lands.

*Environmental Consequences of the No Action Alternative:* No hazardous or solid wastes would be generated or managed under the No Action Alternative.

*Mitigation:* The BLM requires the following mitigation in addition to the activities described in the Proposed Action, to ensure impacts from hazardous or solid wastes would be minimized by implementation. In addition, the Operator would watch for signs of hazardous or solid wastes throughout excavation and operations within the Project Area, and if found, would take the appropriate reporting and mitigation measures to protect the public and workers. For the proposed well, such measures would include the following:

- The Operator would submit a Sundry Notice Form 3160-5 indicating the method for disposing of produced water during production as per Onshore Order #7 timing and requirements.
- The Operator would submit an updated SPCC plan that includes this site to the BLM for our project files.
- The release of any chemical, oil, petroleum product, produced water, or sewage, etc. (regardless of quantity) must be reported by the lease holder, to the BLM – WRFO Hazardous Materials Coordinator at (970) 878-3800.
- A copy of any report required or requested by any federal agency or state government as a result of a reportable release or spill of any toxic substances would be furnished to the BLM AO concurrent with the filing of the reports to the involved federal agency or state government.

## **WATER QUALITY, SURFACE AND GROUND** (includes a finding on Standard 5)

*Affected Environment:* The Project Area is located in the Colorado River Basin. Ground water in the proposed Project Area is associated with the Colorado Plateau aquifer system and is located in the Piceance Basin structural unit. The quality of ground and surface water is interconnected in this region, although the exact location and extent of hydrologic connections are not well understood.

Surface Water: The Project Area is located within the Piceance Creek drainage. Piceance Creek is a tributary to the White River which flows west out of Colorado into Utah to its confluence with the Green River, which ultimately drains into the Colorado River.

Streams receiving runoff from the Project Area include Ryan Gulch and the main stem of Piceance Creek. Water quality standards for these streams are contained in Regulation No. 37, *Classifications and Numeric Standards for Lower Colorado River Basin* (CDPHE 2008a). Under state water quality regulations, stream classifications identify the actual beneficial uses of the water and numeric standards are assigned to determine the allowable concentrations of various parameters.

Ryan Gulch is a tributary to Piceance Creek and is designated for use as Aquatic Life Warm Water – Class 2, Agriculture, and Recreation Secondary Contact. The affected segment of Piceance Creek is designated for use as Aquatic Life Warm Water – Class 2, Agriculture, and Recreation Primary Contact.

No impairments or sources of impairments have been identified in these stream segments. Colorado Regulation No. 93, 2006 303(d) List of Water-Quality-Limited Segments Requiring Total Maximum Daily Loads (CDPHE 2008b), was reviewed for information related to the Project Area drainage. None of the stream segments that drain the Project Area were listed. Colorado Regulation No. 94, 2006 Monitoring and Evaluation List of Water Bodies Identified for Additional Water Quality Evaluation (CDPHE 2008c), was also reviewed for information related to the Project Area drainage. Ryan Gulch has been placed on the Monitoring and Evaluation List for further assessment due to insufficient information on *E. coli* impairment

(CDPHE 2008b). The attainment status for the affected Piceance Creek segment has not been assessed.

Sediment loading from erosional processes is also a water quality characteristic of surface waters in these drainages. During large storm events, sediment loading and transport can be significant. Erosion and the resulting sediment loading occurs under natural conditions in the basin but the increased development and land disturbance occurring in the vicinity of the Project Area is likely resulting in larger amounts of sediment loading in the surface water.

Ground Water: The Project Area contains both alluvial and bedrock aquifers. The alluvial aquifers primarily consist of unconsolidated valley-fill deposits of sand and gravel formed along stream courses. The three principal bedrock aquifers underlying the Piceance Basin are the Uinta-Animas aquifer, the Mesaverde aquifer, and the Dakota-Glen Canyon aquifer system. The quality of the ground water in these aquifers depends on the chemical and physical attributes of the material through which the water passes, the length of time the water is in contact with the material, and other conditions such as temperature and pressure.

The alluvium in the stream valleys tends to be thin, narrow, and discontinuous but contains locally important surficial aquifers. In the Piceance Basin, these unconsolidated alluvial aquifers are the most productive aquifers in the basin (Environmental Protection Agency [EPA] 2004). Based on well records maintained by the Colorado Division of Water Resources, the potable water wells in the Piceance Basin generally extend no farther than 200 feet in depth (EPA 2004).

The shallowest of the bedrock aquifers is the Uinta-Animas aquifer. This aquifer is also known as the upper and lower Piceance Basin sub-aquifers and is present in silty sandstone, siltstone, and marlstone. Dissolved-solids concentrations in water from the upper part of the Uinta-Animas aquifer generally range from about 500 to more than 1,000 milligrams per liter (Robson and Banta 1995). The water chemistry in this part of the aquifer is dominated by dissolved calcium, magnesium, bicarbonate, and sulfate with trace concentrations of strontium and fluoride (Tobin 1987). In the lower part of the Uinta-Animas aquifer, concentrations of dissolved constituents may exceed 10,000 milligrams per liter in parts of the basin (Robson and Banta 1995). Dissolved sodium and bicarbonate are present, as well as fluoride, barium, boron, lithium, and chloride.

The Mesaverde aquifer is located below the Uinta-Animas aquifer, separated by a low permeability confining unit. Water quality in the Mesaverde aquifer is extremely variable. Concentrations of dissolved constituents range less than 1,000 milligrams per liter and high local concentrations occur. For instance, dissolved solids concentrations of more than 10,000 milligrams per liter were documented in the aquifer towards the central part of the Piceance Basin (Robson and Banta 1995).

The deepest of the three primary aquifers, the Dakota-Glen Canyon aquifer, consists of a series of aquifers and confining units at depths that can 12,000 feet in substantial parts of the Piceance Basin. In the Dakota-Glen Canyon aquifer, where the aquifer is deeply buried, the dissolved solids concentration can exceed 35,000 milligrams per liter (Robson and Banta 1995).

*Environmental Consequences of the Proposed Action:* Impacts to surface and ground water quality could occur as a result of the Proposed Action. The magnitude and duration of these impacts would depend on site-specific factors (e.g., soil, vegetation, slope) and the extent of construction activities. Impacts would likely be greatest immediately following completion of construction activities and would likely decrease thereafter due to reclamation and mitigation procedures.

Surface Water: Construction and development activities, including grading, drilling, earth moving, stockpiling, and excavation, may impact water quality through increased sedimentation and runoff. Soil disturbance and removal of vegetative cover increases the potential for soil erosion which in turn, increases sediment loading during runoff-producing storm events. The amount of runoff produced by a storm event may also increase due to soil compaction from the operation of vehicles and other construction equipment. Salts, metals, and organic substances contained in or adsorbed onto sediments can be transported into the surface waters along with the sediment and further degrade water quality. The extent of these impacts depends on the amount and type of surface disturbance at any particular time and the climatic conditions.

The pad design has 10 feet of cut in the center and cut on all four corners. There is only ½ a foot of fill on one side of the pad, but all the other sides are in cut. The center of the pad is 9.3 feet of cut. The excess spoils pile is 36,000 CY, with only 125 CY of fill. Cuts and fills should be balanced as much as possible and the storage area for soil on this pad is almost as large as the pad area. Storage of soil creates as much disturbance as pad construction. Storing soil on native soils results in surface disturbance that would need to be reclaimed. With too much cut and fill interim reclamation would be less successful.

Road construction would also contribute to water quality impacts. The compacted soil of the access road would decrease the ability of the soil to infiltrate precipitation, leading to increased runoff. The road provides a “path of least resistance” and can act as a channel that concentrates runoff. Runoff on roads may be conveyed at higher velocities than would occur with overland flow on undisturbed surfaces, resulting in increased erosion and sediment loading. Sediment and other pollutants present on the road could be transported in the runoff, contributing to water quality degradation.

The water extracted and produced as a by-product of this natural gas development would be of poor quality with high concentrations of total dissolved solids. Spills or leaks of the produced water would result in deposition of salts that if transported into the surface water, could degrade water quality.

Ground Water: Some impacts to ground water quality resulting from hydraulic fracturing may occur, but the extent of the impact is unknown. Ground water contamination from an aquifer of lower quality (generally located at greater depths in the Piceance Basin) to an aquifer of better quality (generally located at a shallower depth) could result if fractures in the confining units are formed as a result of the Proposed Action. Hydrologic connections (both natural and artificial) such as fractures, faults, and high permeability streaks greatly increase the conductivity of the aquifer system. This allows for more rapid transport and mixing of process fluids (e.g.,

drilling/fracturing fluids) with ground water, as well as mixing between ground water of varying quality that occurs in different parts of the aquifer.

Other impacts to ground water could occur if pollutants from any leaks or spills are mobilized in runoff and infiltrated into the shallow aquifers. The storage and evaporation of produced water in reserve pits also has the potential to impact ground water if leaks occur.

*Environmental Consequences of the No Action Alternative:* There would be no additional impacts to water quality under the No Action Alternative.

*Mitigation:* All activities would be required to comply with all applicable local, state, and federal water quality laws, statutes, regulations, standards, and implementation plans. This compliance includes, but is not limited to, the following:

- If erosion features such as riling, gulying, piping and mass wasting occur along the pipeline right-of-way at anytime in the future these erosion features would be addressed immediately after observation by contacting the AO and submitting a reclamation plan with best management practices (BMPs) to address the erosion problems.
- Provide for erosion-resistant surface drainage by adding necessary drainage facilities and prior to rain or snow events. When erosion in disturbed areas is anticipated, sediment barriers would be constructed to slow runoff, allow deposition of sediment, and prevent it from leaving the site.
- Locate culverts or drainage dips (waterbreaks) in such a manner as to avoid discharge onto unstable terrain such as headwalls or slumps. Provide adequate spacing of these drainage features to avoid accumulation of water in ditches or road surfaces. Monitor culvert installations to ensure proper placement and adequate armoring of inlets and outlets. Patrol areas susceptible to road or watershed damage during periods of high runoff.
- Keep road inlet and outlet ditches, catchbasins, and culverts free of obstructions, particularly before and during spring runoff. Routine machine-cleaning of ditches should be kept to a minimum during wet weather. Leave the disturbed area in a condition that provides drainage with no additional maintenance.
- The proposed access road should be built and maintained to BLM Manual Section 9113 standards for road shape and drainage features. Culverts and waterbars should be installed according to 9113 standards and sized for the 10-year storm event with no static head and to pass a 25-year event without failing.
- Due to the excessive excess spoils pile and no consideration of cut and fill balance in the pad design, before construction begins, the operator should submit an alternative pad design that raises the production facilities pad so that it is not entirely in cut and that raises the main pad enough to balance cut and fill so that excess material is less than 2,500 CY. If the frac pit and the reserve pit need to be moved to accommodate this design, then move them. BLM requires that pits be constructed in at least 50% fill. COGCC will allow pits in this area to be constructed partly in fill if they are engineered. The operator should also submit a figure that shows the interim reclamation design proposed by the operator with the new design. Construction on the pad should not begin until the new pad design and interim reclamation design is approved by the AO.

- As per Onshore Order #1 requirements to evaluate on-site and off-site erosion control methods required for the access road and pad. Therefore, the operator will include via Sundry notice a detailed drainage plan including any BMPs that would be installed for the Operator's stormwater management plan. This plan should be reviewed by the WRFO Hydrologist and approved by the AO before construction begins. The plan should describe:
  - construction methods planned for addressing on-site erosion to meet the Operator's stormwater discharge permit requirements;
  - locations for implementing methods for stabilizing disturbed areas after drilling and proposed maintenance. This description of stabilization methods should include seed mixture, seeding rate, and method for mulching and stabilizing (i.e., erosion fabric, tackifier or other method); and
  - locations for all drainage features (culverts, wing ditches, low water crossings etc. needed for the access road.

*Finding on the Public Land Health Standard for Water Quality:* Standard 5 of the *BLM Standards for Public Land Health and Guidelines for Livestock Grazing Management in Colorado* states that the water quality of all water bodies, including ground water where applicable, located on or influenced by BLM lands would meet Water Quality Standards established by the State of Colorado. It is unlikely that access road and well pad construction, or drilling and production activities, would result in an exceedence of state water quality standards. Cumulative impacts from this activity and others may eventually impact sediment yields to the degree that they impact listing of the Piceance Creek or its tributaries.

## **WETLANDS AND RIPARIAN ZONES** (includes a finding on Standard 2)

*Affected Environment:* Wetlands and riparian zones are important resources that are a source of substantial biodiversity and provide multiple ecosystem functions. In the general vicinity of the Project Area, wetland habitat is typically associated with perennial streams and riparian areas typically occur as narrow transition zones between stream and/or wetland areas and the adjacent uplands.

Riparian zones and wetland habitat that could potentially be affected by the Proposed Action include areas occurring along drainages and streams within the Project Area. Streams receiving runoff from the Proposed Action include Ryan Gulch and the mainstem of Piceance Creek.

Drainages within the Project Area include perennial, ephemeral, and intermittent streams. Piceance Creek is a perennial stream. Although this stream supports areas with riparian and wetland communities, the stream corridor is strongly influenced by agricultural practices. In general, the native riparian and wetland vegetation associated with its banks is confined largely to the channel margin.

The stream in Ryan Gulch is intermittent. There are also a few unnamed ephemeral washes in the Project Area. The ephemeral and intermittent streams are dependent on spring runoff and individual storm events for flow and generate little runoff due to the arid climate and well-

drained soils. Due to the limited water supply, well-developed riparian and wetland communities are not present. Where it exists, riparian vegetation is generally extremely limited, present only in isolated pockets, and consists mainly of herbaceous vegetation composed of grasses and other vegetation types associated with semi-arid ecosystems.

*Environmental Consequences of the Proposed Action:* Riparian and wetland communities in the vicinity of the Project Area have the potential to be impacted by the Proposed Action. However, the Proposed Action would not cross any of the perennial streams in the Project Area and the pipeline would be located within one unnamed ephemeral wash connecting to an existing pipeline in Ryan Gulch. The potential for adverse impacts would be greatest during and immediately after construction. However, with the implementation of mitigation measures, impacts would likely be minor.

Potential impacts resulting from the Proposed Action could include increased noxious weeds and subsequent vulnerability of native species, sedimentation of riparian zones, and decreased bank stability. Surface disturbances could lead to the mixing of topsoil with subsoil which could make it more difficult for vegetation to establish during mitigation and reclamation. Soil compaction from heavy equipment activity or stockpiles could alter drainage patterns, inhibit seed germination, or increase the potential for siltation in wetland and riparian areas.

*Environmental Consequences of the No Action Alternative:* The No Action Alternative would have no environmental consequences associated with riparian or wetland communities.

*Mitigation:* All activities would be required to comply with all applicable local, state, and federal water quality laws, statutes, regulations, standards, and implementation plans. This includes compliance with any applicable U.S. Army Corps of Engineers (USACE), CDPHE, and National Pollutant Discharge Elimination System permit requirements. Mitigation measures to further minimize potential impacts to wetland and riparian resources include:

- installing and maintaining erosion control structures and bank stabilization to minimize potential for sediment runoff into surface waters or drainages;
- prohibiting storage of hazardous materials, chemicals, fuels, lubricating oils, concrete coating, and refueling activities within 200 feet of wetland or riparian areas;
- minimizing soil compaction and furrowing by using mats or wide tire/low ground pressure equipment for construction activities within riparian zones (if necessary);
- completing all construction activities in riparian areas during no-flow periods;
- limiting grading, topsoil segregation, and excavation to the area immediately over the trenchline and directly within the footprint of the well pad to avoid excessive disruption of soils and the native seed and rootstock within the soils;
- performing routine daily inspections on equipment and vehicles to identify leaks and initiate corrective actions;
- managing all soil materials such that erosion and sediment transport are minimized; and
- revegetating disturbed areas with BLM-approved seed mixtures as soon as practical following disturbance.

Additional mitigation measures that would reduce impacts to riparian and wetland resources are provided in the Water Quality, Soils, and Vegetation sections of this document.

### **CRITICAL ELEMENTS NOT PRESENT OR NOT AFFECTED**

No Areas of Critical Environmental Concern (ACECs), wilderness, prime and unique farmlands, or wild and scenic rivers exist within the area affected by the Proposed Action. There are also no Native American religious or environmental justice concerns associated with the Proposed Action.

### **NON-CRITICAL ELEMENTS**

The following elements must be addressed due to the involvement of Standards for Public Land Health.

#### **SOILS** (includes a finding on Standard 1)

*Affected Environment:* Soils in the Project Area vary depending on the topography, slope orientation, and parent material from which the soil is derived. The topographic pattern of the general area consists of rolling hills and narrow valleys. Soil types in the area are interrelated to dominant vegetation and can be associated with certain climatic or ecotones, depending on elevation. Soils in the area support dominant vegetation communities such as the sagebrush community and pinyon-juniper woodland (USDA 1982). Table 8 shows the USDA map unit symbols and soil types associated with the proposed well pad (USDA 1982). A summary of the soil characteristics associated with the map unit symbols follows the table.

**Table 8. Well pad map unit symbols.**

<b>Well Pad Number</b>	<b>Map Unit Symbols</b>
41-1-298	73 – Rentsac Series, 91 – Torriorthents-Rock Outcrop Complex, 6 – Barcus Series, 36 – Glendive Series

6 – Barcus Series. The Barcus series consists of very deep, somewhat excessively drained soils that formed in mixed alluvium of calcareous sandstone and shale origin. Barcus soils are on alluvial fans and in narrow valleys and have slopes of 0 to 8 percent.

36 – Glendive Series. The Glendive series consists of very deep, moderately well or well-drained soils that formed in stratified loamy calcareous alluvium. These soils are on floodplains and stream terraces. Slopes are 0 to 8 percent.

73 – Rentsac Series. This series consists of shallow, well-drained soils on ridges, foothills, and side slopes. Slopes range from 5 to 50 percent. It is formed in residuum derived dominantly from calcareous sandstone. Permeability of this Rentsac soil is moderately rapid. Runoff is rapid, and the hazard of water erosion is moderate to very high.

91 – Torriorthents-Rock Outcrop Complex. This map unit is extremely rough and is found on eroded areas on mountains, hills, ridges, and canyon sides. This unit is 50 percent Torriorthents that have slopes of 15 to 65 percent and 30 percent rock outcrop that has slopes of 35 to 90 percent. These soils are very shallow to moderately deep and are well drained and somewhat excessively drained. Torriorthents formed in residuum and colluvium derived dominantly from sandstone, shale, limestone, and siltstone. Permeability of the Torriorthents is moderate. Available water capacity is very low. Runoff is very rapid, and the hazard of water erosion is very high.

Biological Soil Crusts (BSCs), a highly specialized community of cyanobacteria, mosses, and lichen, are likely to be found in these areas, especially locations that have not experienced significant livestock grazing. BSCs are an important component of soil productivity and are the result of an association between soil particles and cyanobacteria, algae, microfungi, lichens and bryophytes which live within or on top of the uppermost soil horizons. Different succession processes favor the formation of these crusts and BSCs play critical ecological roles in these processes. Depending on the site, BSCs are a significant factor in stabilizing soils and reducing erosion and they often play a decisive role in the success of vegetation and retention and/or production of soil nutrients. BSCs are typically more abundant in some locations due to microclimate conditions that are the result of vegetation modifying the local environment by providing nutrients, moisture, reducing sunlight and protecting BSCs from wind and/or water erosion.

*Environmental Consequences of the Proposed Action:* Clearing and grading of the proposed well pad, pipeline ROW, and access road would remove protective vegetative cover from the affected soils, accelerating the erosion process. Grading, trenching, and backfilling activities could cause mixing of the soil horizons and could result in reduced soil fertility reducing revegetation potential. Water erosion of soils associated with construction activities would likely result in a net loss of valuable topsoil by sheet, rill, and gully erosion. Dissolution of calcium carbonate (calcareous soils) may promote development of sink holes and gully formation on and adjacent to disturbed areas if drainage relief structures are not properly designed and installed. Eroded topsoil and subsoil may increase salt loading and sedimentation to surface waters down gradient of disturbed areas. Increased sedimentation/salt loads could adversely impact water quality and aquatic life.

Surface disturbance would remove or bury BSCs and would decreased organism diversity in these areas, and hence decrease soil nutrients, soil stability, and organic matter in the soil horizon. Crusts are well adapted to severe growing conditions, but poorly adapted to compressional disturbances and/or removal that will occur as a result of the proposed action.

Replacement of topsoil and recruitment from adjacent sites will allow BSCs to return to most sites post disturbance. Full recovery of BSCs from disturbances is a slow process, particularly for mosses and lichens. Recovery of pre-disturbance crust thickness can take up to 50 years, and mosses and lichens can take up to 250 years to recover. Limiting the size of the disturbed area increases the rate of recovery, provided that there is a nearby source of inoculums (viable source of biological soil components that can be transported to the site via water, air and/or animals). As areas are reclaimed it is likely that BSCs will eventually recolonize the site. Their success is in

proportion to the success of topsoil saving and reduction in areas disturbed. Saving and replacing topsoil allows for inoculums to repopulate a site; however, the amounts of inoculums needed, viability after storage in a topsoil pile and other factors that determine success are not well known. Therefore, it is likely that BSC will decrease overall in amount and diversity in the areas disturbed for some time into the future.

Unauthorized use of the newly constructed access road during wet conditions would deteriorate the road surface, decreasing effectiveness of drainage structures. Improper drainage from the newly constructed access road would result in elevated erosion rates down gradient and complicate reclamation efforts.

The pipeline passes through fragile soils and steep slopes in several sections (about 1,082 ft of the proposed pipeline ROW) where the pipeline route will pass through or near fragile soils. Reclamation efforts are likely to be more difficult in these areas.

Fragile soils are areas have been identified as having Controlled Surface Use (CSU 1) stipulation in the 1997 White River ROD/RMP (BLM 1997b). The White River ROD/RMP requires that areas with fragile soils present an engineered construction/reclamation plan unless an exception has been granted based on additional soils information that shows soils do not meet the fragile soils criteria. Since no further soils information was provided by the Operator, the plan of development submitted by the Operator may meet the engineered plan required, if the plan addresses the following specific concerns:

1. How soil productivity will be restored.
2. How surface runoff will be treated to avoid accelerated erosion such as riling, gullyng, piping and mass wasting.

Where fragile soils occur along the pipeline right-of-way reclamation will be required to achieve the goals described above. The Operator has not submitted such a plan or indicated any special measures for these areas to protect fragile soils. Mitigation will require immediate action if any of the erosion indicators are observed (see the water quality section). This mitigation should adequately protect these fragile soils with reclamation success.

If they occurred, any leaks or spills of pollutants (e.g., diesel fuel, fracturing fluids, produced water) could compromise the productivity of affected soils. Decreased soil productivity would hinder reclamation efforts leaving soils further exposed to erosional processes.

*Environmental Consequences of the No Action Alternative:* Under the No Action Alternative there would be no additional impacts to soils within the Project Area.

*Mitigation:* See the Water Quality section for applicable mitigation.

*Finding on the Public Land Health Standard for upland soils:* With mitigation, the Proposed Action would be unlikely to reduce the productivity of soils impacted by surface-disturbing activities on public lands.

## VEGETATION (includes a finding on Standard 3)

*Affected Environment:* The vegetation community of the proposed well pad, pipeline, and access route is dominated by mid-age pinyon pine-juniper woodland and big sagebrush, with scattered mature and old-growth pinyon pines and junipers.

The inter-mountain basins big sagebrush ecological system occurs throughout much of the western U.S., and is typically found in broad basins between mountain ranges, plains, and foothills between 1,500 to 2,300 meters in elevation. Soils are typically deep, well-drained, and non-saline. These shrublands are dominated by basin big sagebrush and/or Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*). Scattered juniper, greasewood (*Sarcobatus vermiculatus*), and saltbush (*Atriplex* spp.) may be present in some stands. Rubber rabbitbrush (*Ericameria nauseosa*), yellow rabbitbrush (*Chrysothamnus viscidiflorus*), antelope bitterbrush (*Purshia tridentata*), or snowberry (*Symphoricarpos* spp.) may codominate disturbed stands. Perennial herbaceous components typically contribute less than 25 percent vegetative cover. Common graminoid species include Indian ricegrass (*Achnatherum hymenoides*), blue grama (*Bouteloua gracilis*), thickspike wheatgrass (*Elymus lanceolatus*), , needle-and-thread (*Hesperostipa comata*), basin wildrye (*Leymus cinereus*), James' galleta (*Pleuraphis jamesii*), western wheatgrass (*Pascopyrum smithii*), Sanberg bluegrass (*Poa secunda*), and beardless bluebunch wheatgrass (*Pseudoroegneria spicata inerme*) (Southwest Regional Gap Analysis Program [SWReGAP] 2007).

The pinyon-juniper woodland ecological system occurs on dry mountains and foothills of the Colorado Plateau region from the West Slope of Colorado to the Wasatch Range, south to the Mogollon Rim and east into the northwest corner of New Mexico. These woodlands occur on warm, dry sites on mountain slopes, mesas, plateaus, and ridges. Soils supporting this system vary in texture ranging from stony, cobbly, gravelly sandy loams to clay loam or clay. Understory layers are variable and may be dominated by shrubs, graminoids, or be absent. Associated species include big sagebrush, mountain mahogany (*Cercocarpus montanus*), blackbrush (*Coleogyne ramosissima*), bitterbrush (*Purshia tridentata*), Gambel oak (*Quercus gambelii*), blue grama grass, and James' galleta (SWReGAP 2007).

*Environmental Consequences of the Proposed Action:* Approximately 10.87 acres of vegetation would be disturbed and/or removed in conjunction with the construction of the proposed well pad, pipeline, and access road. Direct impacts of vegetation removal include short-term loss of vegetation including the modification of vegetation structure, plant species composition, and aerial extent of cover types. Removal of vegetation results in increased soil exposure, loss of wildlife habitat, reduced plant diversity, and loss of livestock forage. Indirect impacts include the increased potential for non-native/noxious plant establishment and introduction, accelerated wind and water erosion, changes in water runoff due to road/facility construction, soil impacts that affect plant growth (soil erosion or siltation), shifts in species composition and/or changes in vegetative density away from desirable conditions, and changes in visual aesthetics.

*Environmental Consequences of the No Action Alternative:* Under the No Action Alternative there would be no additional impacts to the vegetation within the Project Area.

*Mitigation:* 1. If construction/development occurs between April 15 and November 15, the Operator would be required to water or surface the access road to reduce airborne dust and damage to roadside vegetation communities.

2. The Operator would promptly revegetate all disturbed areas not necessary for production, including roadside and well pad cut and fill slopes, with a seed mixture approved by the BLM. This may mean broadcast seeding and hand raking with Native Seed mixture #3 as presented below.

Species (Variety)	Pure Live Seed (PLS) pounds per acre
Western wheatgrass (Rosanna)	2
Bluebunch wheatgrass (Whitmar)	2
Thickspike wheatgrass (Critana)	1
Indian ricegrass (Rimrock)	2
Fourwing saltbush (Wytana)	1
Utah sweetvetch	1
Alternates: Needle-and-thread, globemallow	

3. All seed tags will be submitted to the designated Natural Resource Specialist (NRS) within 14 calendar days from the time the seeding activities have ended via Sundry Notice. The sundry will include the purpose of the seeding activity (i.e., seeding well pad cut and fill slopes, seeding pipeline corridor, etc.). In addition, the SN will include the well or well pad number associated with the seeding activity, if applicable, the name of the contractor that performed the work, his or her phone number, the method used to apply the seed (e.g., broadcast, hydro-seeded, drilled), whether the seeding activity represents interim or final reclamation, an estimate of the total acres seeded, an attached map that clearly identifies all disturbed areas that were seeded, and the date the seed was applied. The designated NRS for this project is Brett Smithers (Phone: (970) 878-3818; Email: [brett.smithers@blm.gov](mailto:brett.smithers@blm.gov)).

4. Revegetation would commence immediately after construction and would not be delayed until the following fall. Drill seeding is the preferred method of application. Debris would not be scattered on the pipeline until after seeding operations are completed.

5. The Operator would be responsible for excluding livestock grazing from all reclaimed portions of the well pad. To eliminate livestock utilization of reclaimed areas prior to successful reclamation, a barbed wire fence built to BLM specifications would be constructed around all reclaimed portions of the well pad including cut and fill slopes immediately after interim reclamation is concluded (within 2 weeks) unless otherwise instructed by the BLM.

6. A BLM-specified cattleguard would be placed at the time of fence construction where the well access road bisects the fence line that surrounds the well pad's disturbance imprint. Once reclaimed plant species are fully established on disturbed sites as determined by the BLM (e.g., Desired Plant Community, Public Land Health Standards), the fence and cattle guard would be

completely removed by the applicant after a minimum of two growing seasons. This would allow for reclaimed plant species to establish without grazing pressure from livestock.

7. The Operator would be responsible for achieving a reclamation success rate for interim reclamation and final abandonment (on all disturbed areas associated with the well pad, pipeline, and access road) of sufficient vegetative ground cover from reclaimed plant species within three growing seasons after the application of seed. Additional reclamation efforts would be undertaken at the Operator's expense. Reclamation achievement would be evaluated using the Public Land Health Standards that include indicators of rangeland health. Rehabilitation efforts must be repeated if it is concluded that the success rate is below an acceptable level as determined by the BLM.

8. The designated NRS will be notified 24 hours prior to beginning all reclamation activities associated with this project via email or by phone. Reclamation activities may include, but are not limited to, seed bed preparation that requires disturbance of surface soils, seeding, constructing exclosures (i.e., fences) to exclude livestock from reclaimed areas. The designated NRS for this project is Brett Smithers (Phone: (970) 878-3818; Email: [brett.smithers@blm.gov](mailto:brett.smithers@blm.gov)).

9. The designated NRS will be notified 24 hours prior to beginning all construction-related activities associated with this project that result in disturbance of surface soils via email or by phone. Construction-related activities may include, but are not limited to, pad and road construction, clearing pipeline corridors, trenching, etc. Notification for all construction-related activities, regardless of size, that result in disturbance of surface soils as a result of this project is required. The designated NRS for this project is Brett Smithers (Phone: (970) 878-3818; Email: [brett.smithers@blm.gov](mailto:brett.smithers@blm.gov)).

10. In an attempt to track interim and final reclamation of federal actions related to the development of federal mineral resources, the operator shall submit Geographic Information System (GIS) data to the White River Field Office (WRFO) for any post construction (i.e., "as-built") polygon feature that was included in the Application for Permit to Drill (APD) or Sundry Notice, and associated with the proposed action. GIS polygon features may include, but are not limited to, constructed access roads, existing roads that were upgraded, pipeline corridors, and well pad footprints. Geospatial data will be submitted as ArcView datasets (i.e., shapefiles or features), ArcInfo coverages, or as ArcView compatible data files (e.g., AutoCAD export .dwg files). All AutoCAD files must include the projection information and/or spatial (datum) reference to allow import into a spatially referenced GIS format. The preferred spatial reference for AutoCAD .dwg files is State Plane, Colorado North, NAD83, feet. GIS data shall be submitted electronically to BLM, WRFO Natural Resource Specialist, Brett Smithers ([brett\\_smithers@blm.gov](mailto:brett_smithers@blm.gov); Phone: [970] 878-3818) using the 1983 Geographic Coordinate System (NAD 83 datum). These data shall be submitted within 14 calendar days from the time when construction-related activities have ended for all geographic features associated with the proposed action. If the operator is unable to submit the required information within the specified time period, the operator shall notify the designated BLM contact person (see below) via email or by phone, and provide justification supporting an extension of the required data submission time period. Internal and external review of the reporting process and the adequacy of the associated information to meet established goals will be conducted on an on-going basis. New

information or changes in the reporting process will be incorporated into the request, as appropriate. If the operator is unable to send the data electronically, the operator shall submit the data on compact disk(s) to:

BLM, White River Field Office  
220 East Market Street  
Meeker, Colorado 81641  
Attn: Brett Smithers

If for any reason the location or orientation of the geographic feature associated with the proposed action changes, the operator shall submit updated GIS data to BLM, WRFO within 7 calendar days of the change. This information should be submitted via Sundry Notice.

11. A Reclamation Status Report will be submitted to the WRFO biannually for all actions that require disturbance of surface soils on BLM-administered lands as a result of the proposed action. Actions may include, but are not limited to, well pad and road construction, construction of ancillary facilities, or power line and pipeline construction. The Reclamation Status Report will be submitted by 15 April and 15 August of each calendar year, and will include the well number, API number, legal description, UTM coordinates, project description (e.g., well pad, pipeline, etc.), reclamation status (e.g., interim or final), whether the well pad or pipeline has been re-vegetated and/or re-contoured, date seeded, photos of the reclaimed site, estimate of acres seeded, seeding method (e.g., broadcast, drilled, hydro-seeded, etc.), and contact information for the person(s) responsible for developing the report. The report will be accompanied with maps showing each point (i.e., well pad), polygon, or polyline (i.e., pipeline) feature that was included in the report. Geospatial data will be submitted using the NAD83 UTM, Zone 12 North projected coordinate system, the Transverse Mercator projection, and the GCS North American 1983 geographic coordinate system (NAD 83 datum). In addition, scanned copies of seed tags that accompanied the seed bags will be included with the report. Internal and external review of the WRFO Reclamation Status Report, and the process used to acquire the necessary information will be conducted annually, and new information or changes in the reporting process will be incorporated into the report. The Reclamation Status Report will be submitted electronically via email and as a hard-copy to Natural Resource Specialist, Brett Smithers ([brett\\_smithers@blm.gov](mailto:brett_smithers@blm.gov)). Please submit the hardcopy to:

BLM, White River Field Office  
220 East Market Street  
Meeker, Colorado 81641  
Attn: Brett Smithers

*Finding on the Public Land Health Standard for Plant and Animal Communities* (partial, see also Wildlife, Aquatic and Wildlife, Terrestrial): Standard 3 states that plant and animal communities of native and desirable species should be maintained at viable population levels to sustain public land health. With implementation of mitigation measures and successful revegetation, the Proposed Action would have no effect on the land health standard.

## **WILDLIFE, AQUATIC** (includes a finding on Standard 3)

*Affected Environment:* The Project Area is located on the northern slope of Ryan Gulch approximately 2 miles above its confluence with Piceance Creek. Drainages in the Project Area include Ryan Gulch and Piceance Creek. As described in the Water Quality section, Ryan Gulch and the affected segment of Piceance Creek are designated as Aquatic Life Warm Water – Class 2. These waters are not capable of sustaining an abundance or diversity of biota, including sensitive species, due to physical habitat, water flows or levels, or water quality conditions. Due to lack of substantial aquatic habitat, little aquatic wildlife is expected to occur in the Project Area.

Native fish are present in Piceance Creek downstream of the Project Area and include, but are not limited to, speckled dace (*Rhinichthys osculus*), mountain whitefish (*Prosopium williamsoni*), and mottled sculpin (*Cottus bairdi*). Nonnative brook trout (*Salvelinus fontinalis*) also are present in Piceance Creek; however, their numbers are low.

Sensitive fish species, such as flannelmouth and mountain suckers, have been observed in the mainstem of Piceance Creek downstream of the Project Area. Amphibians, including the BLM-sensitive northern leopard frog, potentially occur within wetland areas associated with Ryan Gulch and Piceance Creek. These species are described in the Threatened, Endangered, and Sensitive Animal Species section.

Irrigation drawdown is a major factor limiting fish populations in Piceance Creek (BLM 2006c), and sometimes reduces the discharge in Piceance Creek to very low levels. During drought years, surface flow sometimes disappears from segments of the creek.

*Environmental Consequences of the Proposed Action:* Surface disturbance and vegetation removal can lead to increased erosion, sedimentation, and risk of contaminants reaching surface waters, which can damage important habitat for aquatic species. Surface water drainage patterns may be altered locally but are not expected to result in surface water depletions. With mitigation measures in place to protect water resources within the Project Area, there would be no effect on Colorado River endangered fish species or other aquatic wildlife from pollution or sedimentation.

*Environmental Consequences of the No Action Alternative:* There would be no effect on aquatic wildlife under the No Action Alternative.

*Mitigation:* BMPs would be used throughout the life of the project to avoid stormwater pollution. Disturbed areas, except areas reasonably needed for production operations, would be reclaimed as early and as nearly as practicable to their original condition and would be maintained to control dust and minimize erosion and salt loading to nearby surface waters. For additional mitigation, concur with mitigation outlined in the Water Quality portion of this document.

*Finding on the Public Land Health Standard for Plant and Animal Communities (partial, see also Vegetation and Wildlife, Terrestrial):* Standard 3 of the *BLM Standards for Public Land*

*Heath and Guidelines for Livestock Grazing Management in Colorado* states that plant and animal communities of native and desirable species should be maintained at viable population levels to sustain public land health. With implementation of mitigation measures and successful revegetation, the Proposed Action would have no effect on the land health standard.

### **WILDLIFE, TERRESTRIAL** (includes a finding on Standard 3)

*Affected Environment:* Big game species present in the Project Area include elk (*Cervus elaphus*), mule deer (*Odocoileus hemionus*), black bear (*Ursus americanus*), and mountain lion (*Felis concolor*). The entire Project Area falls within elk winter range and mule deer severe winter range. Small game species include mountain cottontail (*Sylvilagus nuttalli*), dusky grouse (*Dendragapus obscurus*), and greater sage-grouse, the latter of which is discussed in the Threatened, Endangered, and Sensitive Animal Species section. Raptors and other birds that typically inhabit pinyon-juniper and sagebrush habitats in western Colorado are discussed in the Migratory Birds section. An isolated parcel of the Piceance Creek State Wildlife Area (SWA) is located approximately 0.5 mile west of the Project Area in Ryan Gulch.

*Environmental Consequences of the Proposed Action:* Surface disturbances associated with the Proposed Action would result in the loss of approximately 10.87 acres of big game habitat, including within mule deer severe winter range. Human activity associated with drilling activities and increased traffic could result in increased mortality from vehicle collisions and temporarily displace elk and mule deer into areas of decreased disturbance.

Increased noise, dust, and human presence could result in temporary alteration of the behavior and home ranges of terrestrial wildlife within the Project Area. Populations of mobile wildlife species likely would temporarily disperse to adjacent undisturbed habitat. Activities proposed under the Proposed Action would not likely result in measurable direct effects to any species.

*Environmental Consequences of the No Action Alternative:* There would be no effect on terrestrial wildlife under the No Action Alternative.

*Mitigation:* 1. Activities that may disrupt big game behavior or habitat utility during sensitive time frames would be subject to timing limitations (December 1 through April 30) on severe winter range, as directed by the White River ROD/RMP (BLM 1997b). This stipulation applies to all surface-disturbing activities.

2. To help monitor possible impacts to big game and raptors as result of drilling, completion, and well maintenance (i.e., work-over) activities, the operator shall notify the designated NRS the day the drilling rig moves on to the location and inform him or her of the move. In addition, the operator shall notify the designated NRS within 24 hours from the time the drilling rig moves off the location, when the completion rig moves on to the location and when the completion rig moves off the location. Well maintenance operations will also be reported to the designated NRS within 24 hours from the time the work-over rig moves on to the location and when the work-over rig moves off the location. The designated NRS for submission of rig move

information for this project is: Brett Smithers (Phone: 970.878.3818; Email: brett\_smithers@blm.gov).

*Finding on the Public Land Health Standard for Plant and Animal Communities (partial, see also Vegetation and Wildlife, Aquatic):* Standard 3 of the BLM Standards for Public Land Health and Guidelines for Livestock Grazing Management in Colorado states that plant and animal communities of native and desirable species should be maintained at viable population levels to sustain public land health. The Project Area presently meets the public land health standards for terrestrial animal communities. With implementation of mitigation measures and successful revegetation, the Proposed Action would have no effect on the land health standard.

**OTHER NON-CRITICAL ELEMENTS**

For the following elements, only those brought forward for analysis will be addressed further.

<b>Non-Critical Element</b>	<b>Not Applicable or Not Present</b>	<b>Applicable or Present, No Impact</b>	<b>Applicable &amp; Present and Brought Forward for Analysis</b>
Access and Transportation			X
Cadastral Survey	X		
Fire Management			X
Forest Management			X
Geology and Minerals			X
Hydrology/Water Rights			X
Law Enforcement		X	
Noise		X	
Paleontology			X
Rangeland Management			X
Realty Authorizations			X
Recreation			X
Socioeconomics		X	
Visual Resources			X
Wild Horses	X		

**ACCESS AND TRANSPORTATION**

*Affected Environment:* Rio Blanco CR 5 is a paved road that provides the primary access road to the Project Area. The north end of CR 5 is accessed from Colorado Highway 64 between Meeker and Rangely. The south end of CR 5 is accessed from Colorado Highway 13, north of Rifle. From CR 5, existing BLM access roads and CR 24 would be affected by the Proposed Action.

A total of approximately 0.35 mile of access road with a 30-foot-wide construction ROW would be constructed in association with the Proposed Action. The road would be constructed to address on-the-ground conditions with the goal of minimizing surface disturbance.

Average daily traffic numbers compiled from the Colorado Department of Transportation and the Garfield and Rio Blanco Counties Road and Bridge Departments were compiled for EAs in the vicinity of the Project Area (BLM 2006b, 2006c). Table 9 shows this compiled data for major roads that would access the Project Area.

**Table 9. Average daily traffic for major access roads in the Project Area.**

Road	Baseline Average Daily Traffic
Colorado Highway 13 between Rifle and junction with south end of Rio Blanco CR 5 (Piceance Creek Road)	2,300 <sup>1</sup>
Colorado Highway 13 between south end of CR 5 and Colorado Highway 64 near Meeker	2,300 <sup>1</sup>
Colorado Highway 64 between Meeker and north end of CR 5	830 <sup>1</sup>
Colorado Highway 64 between north end of CR 5 and Colorado Highway 139	1,700 <sup>1</sup>
CR 5 (Piceance Creek Road)	562 - 1,076 <sup>2</sup>

Source: BLM 2006b, 2006c (CR = County Road )

<sup>1</sup>CO Dept. Transportation.

[http://www.dot.staet.co.us/App\\_DTD\\_DataAccess/Downloads/TrafficVolumeMaps/TVMa1.pdf](http://www.dot.staet.co.us/App_DTD_DataAccess/Downloads/TrafficVolumeMaps/TVMa1.pdf).

<sup>2</sup>Rio Blanco Country Road and Bridge Department, 2005. Lower traffic range measured in May, high traffic range measured in late October/early November, coinciding with big game hunting season.

*Environmental Consequences of the Proposed Action:* The Proposed Action would increase traffic on existing roadways. The increased vehicle traffic associated with the Proposed Action would include heavy equipment and loads.

During construction, numerous workers and contractors would commute regularly to and from the job site. Construction of access to the site and pipeline connections would cause a disruption to the flow of traffic along the affected county roads for a short period of time. After construction at the site is completed, smaller crews or individuals would commute periodically for maintenance and other associated activities.

The CRs in the vicinity of the Project Area were originally designed for rural and agricultural uses and were not intended for the repeated heavy loads associated with the current increase in oil and gas development. The increasing traffic volume, frequency, and vehicle size on these rural roads has and would likely continue to result in an increase in the costs associated with road repair and maintenance. If road maintenance activities are not commensurate with the levels of road usage, surface damage to roads may occur.

*Environmental Consequences of the No Action Alternative:* There would be no additional environmental consequences associated with the No Action Alternative.

*Mitigation:* All activities would be required to comply with all applicable local, state, and federal transportation laws, statutes, regulations, standards, and plans. Activities would strictly adhere to BLM Gold Book, *Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development* (BLM 2006a).

Further mitigation of impacts to access and transportation should be achieved through management practices including:

- use of a construction yard as the primary parking for personal vehicles;
- encouragement and/or arrangement for employees and contractors to carpool to and from the site;
- controlling dust along unsurfaced access roads and minimizing the tracking of mud onto paved roads; and
- post-construction restoration of unsurfaced roads to equal or better than conditions that existed before construction.

## **FIRE MANAGEMENT**

*Affected Environment:* The objectives of fire management in the WRFO are to protect public health, safety, and property as well as to allow fire to carry out natural ecological functions. Prescribed fire, which includes both management and natural ignition sources, may be used to achieve land or resource management objectives.

The topographic pattern of the general area consists of rolling hills, broad ridge tops, and narrow valleys. Soil types in the area are interrelated to dominant vegetation and can be associated with certain climatic conditions or ecotones, depending on elevation. Soils in the area support dominant vegetation communities such as the sagebrush community and pinyon-juniper woodland. The most common species in the area are pinyon pine and one-seed juniper. Utah juniper (*Juniperus osteosperma*) and common juniper (*Juniperus communis*) are also present. Stand composition, site characteristics, and productivity are highly variable and are based on moisture relationships (BLM 1997a). Tree heights generally average 15 to 25 feet with tree densities varying from proposed site to proposed site. The understory consists of predominately big sagebrush, rabbitbrush, forbs, and grasses with varying degrees of scattered dead and down woody debris and slash.

The mature plant communities and relatively dry climate of the Piceance Basin make this area prone to fire especially during the heat of summer when rains are infrequent and dry thunderstorms are common. Fires in this area typically move quickly as they gain momentum from the flashy fuels and considerable fuel loads associated with mature undisturbed pinyon-juniper woodland habitats. Fire events play an important role in this type of ecosystem, rejuvenating and maintaining healthy, diverse plant communities. Natural fire probably maintains woodlands at a constant overall acreage, but human interference in this natural cycle through fire suppression has extended the range of these woodlands. Fire suppression has greatly increased fuel buildup and enhanced the maturity and encroachment of shrubs and woodlands,

thus producing older age plant communities with decreased diversity in structure and species composition.

In the spring of 1997 an inter-disciplinary team met to begin the fire planning process. The process was used to establish resource and fire management objectives for public land within the District. These treatments range from a strict no burn policy to using fire either natural/prescribed as a tool to meet resource management objectives. The result was a map outlining objectives based on the following four categories (BLM 1999).

**Category A** areas are where fire is not desired at all. These areas include ecosystems where fire never played a significant role in the function of the ecosystem. In Category A areas, suppression is required to prevent direct threats to life or property. All fires in these areas would be aggressively suppressed.

**Category B** areas are where unmanaged wildfire is not desired. These are ecosystems where unplanned ignitions could have negative effects on identified resources unless resource constraints can be met or where mitigation can minimize or remove concerns. Fire suppression in these areas is aggressive; however, use of natural fires is not dismissed if suppression tactics could be used such that resource concerns could be mitigated. Negative effects of fire here include risks to private lands and urban interfaces, important cultural resources, areas with unnatural fuel buildups, and areas where the seed bank does not exist for natural reseeding. Mitigation efforts could include fuel reduction through mechanical means or prescribed fire to reduce fuel loading around private land and urban interfaces, creation of agreements to allow fire to cross from public to private lands, cultural resource inventories, preparation of rehabilitation plans prior to a fire event, etc. Once mitigation is in place, Category B areas could move into a "C" or "D" category where use of wildfire for resource benefit would occur more frequently.

**Category C** areas are where fire is desired but where there may be social, political, or ecological constraints that must be considered. These constraints could include air quality considerations (proximity to Class I airsheds or non-attainment areas), threatened or endangered species considerations (effects of fire on the survival of these species), or habitat considerations (both spatial and temporal). Use of natural ignitions to attain desired resource/ecological conditions is maximized in these areas when possible.

**Category D** areas are where fire is desired and where few, if any, constraints to its use have been identified. These areas offer the greatest opportunity to take advantage of the full range of options available to the resource manager for managing fire under appropriate management response.

The Project Area is designated as a Fire Management Treatment Category C in the Lower Piceance Basin Fire Management Plan Area. In the C6 polygon (Lower Piceance Basin) there have been four small fires since 2005 within 0.75 mile of the proposed site. In June of 2008 the White River Field Office excluded 14,120 acres of this polygon from WFU (Wildland Fire Use). The proposed action falls within this exclusion area. This fire management tactic has been excluded from the area in an effort to promote firefighter and public safety. The reasoning behind this decision was mainly due to the rapid increase of industrial activity (natural gas drilling, oil shale development, and infrastructure construction) that has resulted in

unprecedented numbers of vehicles and people working and/or traveling in the Piceance Basin. As a result, fires within this area shall be managed in a more aggressive manner by BLM fire staff.

*Environmental Consequences of the Proposed Action:* The Project Area is primarily in mid-age pinyon-juniper woodland habitats with moderate to considerable fuel loads. The surface disturbance and inclusion of structures associated with the Proposed Action could adversely impact the fire cycle and the proper role of fire burning naturally within the ecosystem. These disturbances would break up continuous fuels and reduce the potential of a natural mosaic burn. Vegetation removal and soil disturbance could provide an opportunity for noxious weeds and cheatgrass to invade the Project Area, which could result in a shift from the natural fire regime to an unnatural, more frequent, fire regime and the loss of key ecosystem components (BLM 2006c). Fire management may have little choice but to suppress all fires within close proximity to the project area. This aggressive fire suppression response would prevent fire from playing a natural role in creating a vegetation mosaic. Even if the moratorium on Wildland Fire Use is lifted, the Fire Management Plan (pg. B-69) states that full suppression would be used when a fire is within one mile of “improvements” where a continuous fuel bed exists. In addition, the proposed access road may be used by the general public for a variety of reasons. This increased public use could increase the potential for a human-caused wildland fire.

*Environmental Consequences of the No Action Alternative:* No impacts associated with the Proposed Action would occur. Fire management practices, including fire suppression, would be consistent with current management actions.

*Mitigation:* The Operator would be responsible for developing a fire management plan as an integral part of the overall safety plan. In the case of an incident, the Operator would immediately notify the BLM via Craig Interagency Dispatch 970-826-5037. No suppression actions would be taken on naturally ignited fires until meeting with the incident commander for any given incident. Further mitigation of impacts to the fire cycle could be achieved through management practices including:

- Notify the BLM, and affected landowners, of any fires during construction, maintenance, or operation.
- Inform site personnel of fire prevention practices concerning smoking materials, welding, etc., and make hand tools available, including shovels and fire extinguishers, for fire control.
- Furnish all motor vehicles and equipment with fire-extinguishing equipment and stage fire fighting equipment and water tanks on site in readily accessible areas.
- Fire suppression equipment would not include the use of heavy equipment such as bulldozers or road graders. The applicant may initially attempt to suppress human caused fires from the result of activities related to construction of proposed project *only* if employee safety is not endangered and if the fire can be safely contained using hand tools and portable hand pumps. If fire extinguishers are used to suppress any fire, the applicant and all associated contractors would notify the responding firefighters and Craig Interagency Dispatch Center of such use.

- Construct defensible space as necessary and determine design criteria in coordination with BLM fire staff.
- Perform all welding activities in areas where vegetation and other flammable materials have been removed.
- Control noxious weeds and cheatgrass as discussed in the Invasive, Non-Native Species section.
- Seed disturbed areas as discussed in the Vegetation and Soils sections.
- Redistribute large, woody material salvaged during clearing operations on WRFO-administered lands and disperse materials over the portion of the ROW from which the trees and brush were originally removed to meet fire management objectives (not to exceed 20 percent total ground cover for woody debris) and to provide wildlife habitat, seedling protection, and deter vehicular traffic.
- Refer to the 2008 Northwest Colorado Fire Program Area Fire Management Plan (Craig Interagency Dispatch Center 2008) for additional mitigation requirements.

## FOREST MANAGEMENT

*Affected Environment:* The pinyon-juniper woodland forest habitat found in the Project Area occurs on dry mountains and foothills of the Colorado Plateau Region from the West Slope of Colorado to the Wasatch Range of Utah. These woodlands occur on warm, dry sites on mountain slopes, mesas, plateaus, and ridges in the Piceance Basin. The most common species in the area are pinyon pine and one-seed juniper. Utah juniper and common juniper may also be present. The stand composition, site characteristics, and productivity are highly variable and are based on moisture relationships (BLM 1997a).

Within the White River Resource Area (WRRRA), the forest management program has been divided into two sections, Timberland Management and Woodland Management. Areas defined as timberlands consist of lands that support stands of trees dominated by Douglas-fir (*Pseudotsuga menziesii*), spruce (*Picea* spp.), fir (*Abies* spp.), lodgepole pine (*Pinus contorta*), and aspen (*Populus tremuloides*). Areas defined as woodlands consist of lands that support stands of trees dominated by pinyon-juniper and Gambel oak.

There are approximately 24,125 acres of timberlands and approximately 622,590 acres of woodlands in the WRRRA (BLM 1997b). The objective of the BLM for forestry is to manage the timberlands and woodlands to maintain productivity, extent, forest structure, and enhancement of other resources. Under the 1997 plan, 27,600 acres of suitable woodland habitat in the Piceance Geographic Reference Area (GRA) are available for commercial harvest of juniper posts and poles with a yearly allowable harvest of 45 acres (BLM 1997b). This would allow maintenance of stand structure relative to old growth type, on approximately 80 percent of the commercial woodland within the Piceance and Douglas/Cathedral GRA (BLM 1997b). Cutting woodlands for oil and gas activities would make woodland products available for removal by individuals. Access and availability to these now disturbed woodlands would decrease human pressures on other undisturbed remote areas.

*Environmental Consequences of the Proposed Action:* The Proposed Action would not impact management objectives for timberland areas, but would affect woodland management areas. The Proposed Action includes well pad, pipeline, and access road construction that would result in surface and forest disturbance of pinyon-juniper woodlands. The total area disturbed including overburden to construct the well pad, access road, and pipeline ROW would be approximately 10.7 acres in the pinyon-juniper woodland community (the remaining approximately 0.4 acre of total disturbance would occur in sagebrush). The estimated volume of pinyon-juniper woodland removed for construction of the Proposed Action is provided in Table 10. Impacts would be long-term until woodlands re-vegetate successfully. Following reclamation of the access road and well pad, these woodlands could be re-colonized within 30 years and would develop old growth characteristics between 150 and 300 years. As discussed in previous sections, removing woodland vegetation also results in increased soil exposure, loss of wildlife habitat, reduced plant diversity, and loss of livestock forage.

**Table 10. Estimated volume (cords) of pinyon-juniper woodland removed for construction of well pad, access road, and pipeline.**

Pinyon-Juniper Age Class	Well Pad Disturbance (acres)	Access Road Disturbance (acres)	Pipeline Disturbance (acres)	Total Disturbance (acres)	Estimated Volume Wood Removed (cords)
Old-growth/mature <sup>1</sup>	5.10	1.27	n/a	6.37	127.40
Young/open-canopied <sup>2</sup>	n/a	n/a	4.73	4.73	56.76
<b>Estimated total</b>					<b>184.16</b>

<sup>1</sup> Old-growth/mature estimated at 20 cords/acre

<sup>2</sup> Young/open-canopied estimated at 12 cords/acre

*Environmental Consequences of the No action Alternative:* There would be no harvesting of trees or other forest-related environmental consequences under the No Action Alternative.

*Mitigation:* All trees removed in the process of construction would be purchased from the BLM. The trees would be cut at a maximum stump height of 6 inches and disposed of by one or more of the following methods (BLM 1997b):

- Purchased trees could be removed from federal land for resale or private use.
- The stockpiled ground cover would be evenly distributed over the disturbed areas not to exceed 20 percent total ground cover for woody debris. The recommended seed mixture to be used on all disturbed areas would be determined by the WRFO. The dirt contractor would be provided with an approved copy of the surface use plan.
- Vegetative material and topsoil would be stockpiled and used for reclamation. All cut and fill slopes would be revegetated immediately after construction with the seed mixture(s) specified in the Conditions of Approval.
- A hydro-ax or other mulching type machine could be used to remove the trees. The machines are capable of shredding trees up to 12 inches in diameter and 15 feet tall as well as mowing brush like a conventional brush beater. It generally leaves small branches and pieces of wood from pencil size up to bowling ball size and the mulch is evenly scattered across the surface. This would effectively breakdown the woody fuel and scatters the debris thereby eliminating any hazardous fuel load adjacent to the new road

and well pad. If this type of tree removal is used, enough vegetation would be stock piled to adequately cover 20% of the surface for the well pad and stock pile the material adjacent to the top soil stock pile. Redistribution of woody material will not exceed 20% ground cover (using ocular estimation) in order to provide surface cover that provides for varied microclimatic conditions and sites for seedling protection that complements vegetation restoration. Where the pipeline right of way intersects travel routes, retain enough of woody material to sufficiently deter travel. For example, use the limbed tree bole, with root wads intact, in areas where the use of existing Pinyon-juniper stands would assist in the deterrence. The ground cover should not exceed 20%. Material brought back onto the pipeline ROW should be evenly scattered, so as to not create jackpots of fuel.

## **GEOLOGY AND MINERALS**

*Affected Environment:* The Project Area is located within the Piceance Basin which occupies approximately 7,100 square miles in northwestern Colorado (Colorado School of Mines 2007). The basin's boundaries are the White River to the north, the Cathedral Bluffs to the west, the Roan and Book Cliffs on the south, and to the east the crest of the ridge system that serves as the head of Piceance Creek. The eastern edge of the basin is roughly defined by the north/south-trending ridges, called the Grand Hogback, that run from Rio Blanco to the White River. The basin generally trends from southeast to northwest and is asymmetric, with steep beds on the eastern boundary and gentle dips on the western edge. The higher elevations, on the south side of the northwest-trending down warp, reach 9,000 feet, while at the north end, where Piceance Creek flows into the White River, the elevation is approximately 5,700 feet (BLM 2007a).

The Uinta Formation (Eocene) is present immediately below the surface within the Project Area (Duncan 1976a). The proposed well would be drilled from the Uinta Formation into the Williams Fork Formations of the Late Cretaceous Age Mesaverde Group. The following is a summarized discussion of these geological features.

Oil shale and sodium resources occur in the Parachute Creek Member of the Green River Formation.

The Mesaverde Group consists of three dominant reservoir facies: lenticular, fluvial sandstones of the Williams Fork Formation; coals that occur in the basal portion of the Williams Fork Formation; and extensive shoreline-marine sandstones of the Iles Formation. The fluvial sandstones of the Williams Fork Formation are approximately 4,000 feet thick in the eastern part of the Piceance Basin, thinning to <2,000 feet on the Douglas Creek Arch. These sandstones are lithic arkoses and feldspathic arenites containing authigenic quartz and carbonate cement. They have low porosities, ranging from 7 to 12 percent, and low matrix permeabilities due to the abundance of authigenic clays (Energy Efficiency and Renewable Energy 2007).

The Operator's targeted zone is in the Mesaverde Formation. The proposed well would be located in an area identified in the White River ROD/RMP as available for oil shale and multi-mineral leasing. During drilling, potential water, oil shale, sodium resources, and gas zones may

be encountered from the surface to the targeted zone. Fresh water aquifers zones that may be encountered during drilling are the Perched in the Uinta, the A-groove, B-groove, and the Dissolution Surface in the Green River Formation. Aquifer zones in the Green River Formation and portions of the Wasatch area are known for loss circulation and difficulties in drilling and cementing.

*Environmental Consequences of the Proposed Action:* Drilling and completion may adversely affect the freshwater aquifer zones if there is loss of circulation or problems cementing the casing. However, the proposed drilling, cementing, and completion procedure of the Proposed Action would isolate the formations and would prevent the migration of gas, water, and oil between formations. Development of these wells would deplete the hydrocarbon resources in the targeted formation. The well location may prevent an orderly future development of sodium and oil shale resources.

*Environmental Consequences of the No Action Alternative:* Under the No Action Alternative there would be no additional impacts to the geological resources within the Project Area and the natural gas resources in the targeted zones would not be recovered at this time.

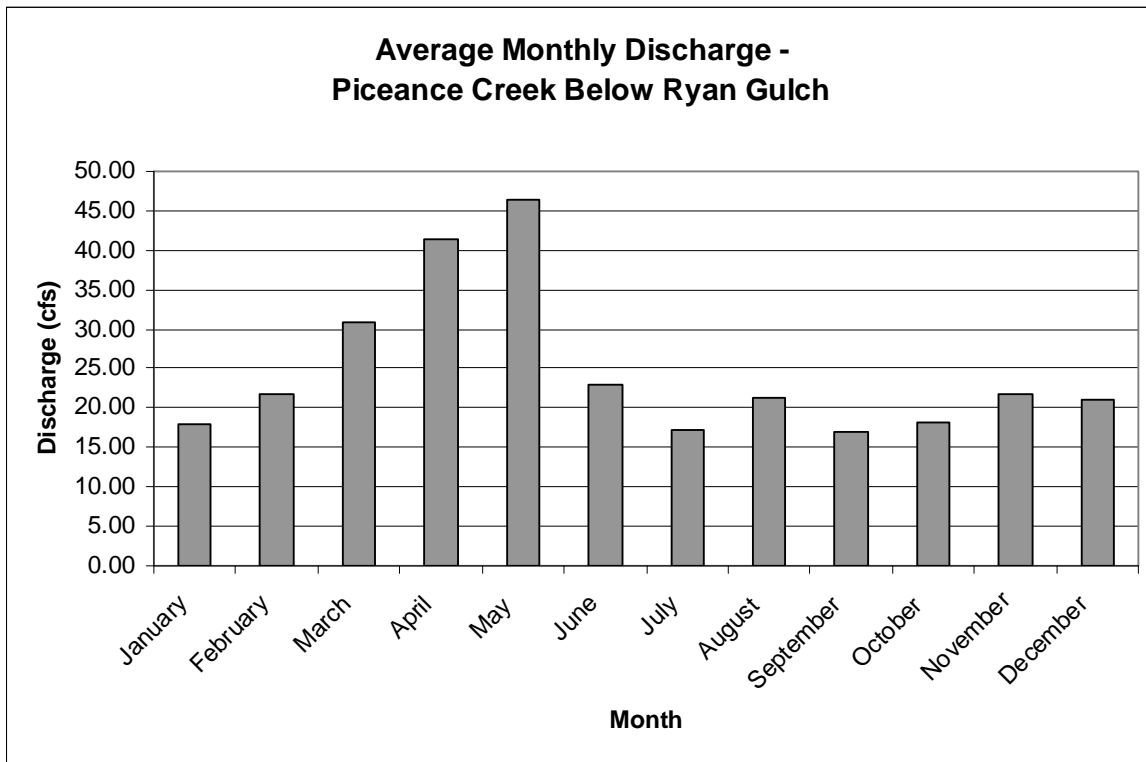
*Mitigation:* None.

## **HYDROLOGY AND WATER RIGHTS**

*Affected Environment:* The Project Area is located in the White River Basin within the Lower Colorado River Basin. Ground water in the proposed Project Area is associated with the Colorado Plateau aquifer system and is located in the Piceance Basin structural unit. The Project Area has an arid to semi-arid climate with dry, sunny conditions and a wide diurnal temperature range. Average annual precipitation ranges from approximately 12 to 20 inches. The basin receives precipitation in the form of both rainfall and snow. Approximately 98 percent of this precipitation is lost to evapotranspiration (Taylor 1987). Water that remains in the system becomes surface water flow or infiltrates, recharging ground water. Ground and surface water hydrology are interconnected in this region; however, the exact location and extent of hydrologic connections are not well understood.

Surface Water Current U.S. Geological Survey (USGS) discharge data is available near the Project Area, recorded on Piceance Creek below Ryan Gulch (USGS gage 09306200). The gage is located at an elevation of 6,070 feet. An examination of this flow data shows that mean monthly flows are the highest in the spring time (Figure 2), which coincides with runoff from snowmelt, and lowest in late summer and early fall. High intensity summer storm pulses also produce short-term high flows in this area.

The Project Area is not currently highly populated but there are large water demands for irrigation and industrial use. Mineral development, including coalbed methane extraction and oil shale development, is increasing in the area and resulting in additional demands for water.



**Figure 2. Mean monthly discharge - Piceance Creek below Ryan Gulch.**

The Colorado Decision Support System (CDSS 2007) was searched to identify water rights near the Project Area. There are numerous water rights within and around the Project Area. These water rights are associated with springs, ditches, reservoirs, and wells. A variety of water uses are served by these rights including storage, irrigation, commercial, industrial, augmentation, fishery, recreation, municipal, and domestic uses.

Ground Water The ground water hydrology of the proposed Project Area is associated with the Colorado Plateau aquifer system and is located in the Piceance Basin structural unit. The Piceance Basin contains both alluvial and bedrock aquifers. The alluvial aquifers primarily consist of unconsolidated valley-fill deposits of sand and gravel formed along stream courses. The three principal bedrock aquifers underlying the Piceance Basin are the Uinta-Animas aquifer, the Mesaverde aquifer, and the Dakota-Glen Canyon aquifer system.

In the Piceance Basin, the primary source of natural ground water recharge is the infiltration of snowmelt in higher elevation areas of the basin. Subsurface flow of the recharge occurs downward and laterally passing through a system of permeable zones and leaking through less permeable confining units. The formation of fractures and solution channels has increased the permeability of the system such that local recharge of lower parts of the formation can occur.

Alluvial deposits in the Project Area are located in the stream valleys. They tend to be thin, narrow, and discontinuous but contain locally important surficial aquifers. In the Piceance Basin, these unconsolidated alluvial aquifers are the most productive aquifers in the Basin (EPA 2004). The city of Meeker is supplied by wells in the White River alluvium, where the thickness of the saturated alluvium is more than 100 feet thick (Welder 1987). Saturated alluvium also exists near

the Project Area. Test holes drilled in Piceance Creek, approximately 4 miles upstream of the Black Sulphur Creek confluence penetrated about 70 feet of saturated sand and gravel (Welder 1987). However, test holes drilled on Piceance Creek about 4 miles downstream of the Black Sulphur Creek confluence penetrated as much as 70 feet of organic clay. This demonstrates that the characteristics of the alluvium in this area are not uniform and can change over a relatively short distance.

*Environmental Consequences of the Proposed Action:* Potential impacts to surface and ground water flow patterns may occur as a result the Proposed Action. On-site ground water extraction would occur as produced water is removed from saturated areas encountered during the drilling and extraction process. This local removal of ground water from the system could result in minor impacts to ground water flow at this site. Local changes in ground water flow could potentially lead to indirect impacts on surface waters caused by a reduction in ground water discharge but given the relatively slow movement of ground water in the subsurface and the depth that produced water would be extracted; potential depletions would likely be minimal.

Direct impacts to surface water would also likely be minimal. Due to increased surface disturbance from the proposed well pad and road, surface water drainage patterns may be altered locally. Runoff that otherwise would have infiltrated into the ground may flow more rapidly into the nearby drainages as overland flow. This effect is likely to be localized and would not alter the overall surface water patterns in the Piceance Basin. This decrease in infiltration to ground water would only occur locally and is not likely to significantly alter natural recharge patterns.

If induced fracture networks were to alter the natural interactions between aquifer systems (e.g., if fractures in confining units are formed), changes in ground and surface water flows could occur. If flow patterns are altered, natural recharge/discharge patterns could be impacted. Recharge and discharge could occur in different amounts or different locations resulting in changes to gaining and losing reaches of the stream and subsequently, channel morphology. The productivity of wells and springs located downgradient of the Project Area could also be affected. The processes governing these potential effects are complicated and the extent and magnitude of these effects is not known. However, current well design and drilling techniques consider these potential effects and incorporate controls (e.g., casing) to minimize changes to the natural connections between aquifers.

Impacts from the Proposed Action on other water rights in the area have not been quantified. As discussed above, some ground water would be removed from the system as produced water associated with the Proposed Action. A right to use ground water typically requires the approval of an augmentation plan to protect downstream or downgradient users. The produced water would be extracted from deep, saturated zones in the Mesaverde Group. This water is of poor quality and not drawn on for beneficial use in the area. The hydrologic connectivity between the ground water affected by the Proposed Action and the ground water extracted from the alluvial wells for beneficial use is likely limited.

Potential impacts to water quality are addressed in the Water Quality section.

*Environmental Consequences of the No Action Alternative:* There are no environmental consequences associated with the No Action Alternative.

*Mitigation:* An estimate of the volumes of water that would be used for construction, drilling, completion, fracing, and dust abatement and the final source of drilling waters would be provided to the WRFO hydrologist before drilling begins.

## PALEONTOLOGY

*Affected Environment:* According to published geologic mapping (Duncan 1976a, 1976b, 1976c, 1976d; Hail 1984), the Project Area is immediately underlain by Unit 5 of the Eocene-age Uinta Formation. The following is a discussion of the geology and paleontology of this unit, as well as its paleontological sensitivities according to the Potential Fossil Yield Classification (PFYC) System (U.S. Forest Service [USFS] 1996) and BLM Condition System (Conditions 1–3) (BLM 1998). A summary is provided in Table 11.

**Table 11. Summary of paleontological sensitivity and recommendations.**

Well #	Geologic Unit (well pad)	Map	PFYC	Mitigation	Geologic Unit(s) (access/pipeline)	Map	PFYC	Mitigation
41-1-298	Unit 5, Uinta Formation	Tu5	Class 5	Monitor	Unit 5, Uinta Formation	Tu5	Class 5	Monitor

Uinta Formation Strata of the Uinta Formation in the Piceance Creek Basin consist largely of distributary channel sandstone complexes with interbedded overbank deposits. In the northern Piceance Creek Basin, the distributary channels appear to have been draining into the eastern portion of Lake Uinta during Eocene time, and they interfinger extensively with the Green River Formation. In the Piceance Creek Basin, the Uinta Formation appears to be older than the type Uintan North American Land Mammal Age (NALMA) in the Uinta Basin based on Bridgerian-age fossils and superpositional relationships (Duncan 1976a; Hail and Smith 1994, 1997).

The Uinta Formation is scientifically important because it is the stratotype for the Uintan NALMA and represents nearly all of Uintan time (46.5–40.0 million years ago) (Murphey and Evanoff 2006; Townsend 2004; Walsh 1996). Approximately 31 percent of modern mammalian families appear in the fossil record of North America during the Uintan NALMA (Black and Dawson 1966). Vertebrate fossils are not as common in the Uinta Formation in the Piceance Creek Basin as in parts of the Uinta Formation in the Uinta Basin, although this is at least in part reflective of the fact that it is more vegetated, difficult to access, and has not been as heavily prospected. Recent paleontological surveys associated with oil and gas development are adding significantly to the known fossil flora and fauna of this unit.

Plant fossils have been discovered in all Uinta Formation stratigraphic units in the Piceance Creek Basin, and are considered scientifically significant because plants are relatively uncommon in the Uinta Formation in the Uinta Basin. Fossil insects are also known from the upper portion of the Uinta Formation Group C (Robinson 1978; Hail and Smith 1994, 1997).

Because of the locally abundant fossils contained in the Uinta Formation, it is considered highly sensitive paleontologically and has been designated as BLM Condition 1 and PFYC Class 5.

In the Piceance Creek Basin of Colorado, the Uinta Formation has been subdivided into Units 1 through 6 or Groups A through G (Duncan 1976a; Hail and Smith 1994, 1997). According to published geologic mapping (Duncan 1976a, 1976b, 1976c, 1976d; Hail 1984), the Project Area is underlain by Unit 5 of the Uinta Formation.

Unit 5 of the Uinta Formation consists of dominantly brown- and buff-weathering ledge-forming sandstone with minor gray and greenish-gray siltstone. The thickness ranges from 150 (Duncan 1976d) to 500 feet (Duncan 1976b). Unit 5 is generally overlain by the Black Sulphur Tongue of the Green River Formation and underlain by the Thirteenmile Creek Tongue of the Green River Formation (Duncan 1976c). No specific information regarding the fossil content of this particular unit was found during the literature search conducted for this assessment. However, due to the high paleontological sensitivity of the general Uinta Formation, it should be considered highly sensitive paleontologically and designated as BLM Condition 1 and PFYC Class 5 until more specific information becomes available.

*Environmental Consequences of the Proposed Action:* The loss of any identifiable fossil that could yield information important to prehistory, or that embodies the distinctive characteristics of a type of organism, environment, period of time, or geographic region, would constitute a long-term, adverse impact. Direct adverse impacts on paleontological resources primarily concern the potential destruction of non-renewable paleontological resources and the loss of information associated with these resources. This includes the unlawful or unauthorized collection of fossil remains by project personnel during construction. Indirect adverse impacts are typically associated with increased public access to public lands due to new roads and trails, and the resulting increased potential for vandalism and unlawful collecting (poaching) of fossils.

If potentially fossiliferous bedrock or surficial sediments are disturbed, the disturbance could result in the destruction of paleontological resources and subsequent loss of information, resulting in an adverse impact. However, direct adverse impacts to paleontological resources typically can be mitigated to below the level of significance, as discussed below. Paleontological mitigation in itself can be considered a beneficial impact because it results in the discovery, salvage, and permanent preservation of fossils in public museums where they would be available for scientific research, education, and display.

In general, for areas that are underlain by paleontologically sensitive geologic units, the greater the amount of ground disturbance, the higher the potential for adverse impacts to paleontological resources. Due to the high paleontological sensitivity of the Uinta Formation, there is a high potential to impact scientifically significant paleontological resources during ground disturbance associated with the Proposed Action.

*Environmental Consequences of the No Action Alternative:* There would be no new impacts to paleontological resources under the No Action Alternative.

*Mitigation:* The Operator is responsible for informing all persons who are associated with the project operations that they would be subject to prosecution for knowingly disturbing paleontological sites, or for collecting fossils. If fossil materials are uncovered during any project or construction activities, the Operator is to immediately stop activities in the immediate area of the find that might further disturb such materials, and immediately contact the AO. Within five working days the AO would inform the Operator as to:

- Whether the materials appear to be of noteworthy scientific interest; and
- The mitigation measures the Operator would likely have to undertake before the site can be used (assuming in situ preservation is not feasible).

If the Operator wishes, at any time, to relocate activities to avoid the expense of mitigation and/or the delays associated with this process, the AO would assume responsibility for whatever recordation and stabilization of the exposed materials may be required. Otherwise, the Operator would be responsible for mitigation cost. The AO would provide technical and procedural guidelines for the conduct of mitigation. Upon verification from the AO that the required mitigation has been completed, the Operator would then be allowed to resume construction.

Additional mitigation measures could further reduce potential adverse impacts on paleontological resources. The following measures should be implemented in lieu of pre-construction paleontological field surveys wherever rocks of the Uinta Formation would be disturbed.

- Museum record searches should be conducted to 1) determine whether any known fossil localities occur within the study area; 2) assess the potential for disturbance of these localities during construction; and 3) further evaluate the paleontological sensitivities of the Uinta Formation within the study area.
- A qualified paleontological monitor, under the supervision of a qualified and BLM-permitted Principal Investigator (PI), should be on site during all construction activities to systematically inspect bedrock exposed during ground disturbance, thus facilitating fossil discovery and salvage. If the paleontological sensitivity of the rocks within the Project Area is deemed to be less than anticipated by the PI after monitoring has commenced, the PI should have the authority to downgrade the sensitivity of the Project Area or portions therein, thus reducing the level of the monitoring effort to spot checking or clearance.
- All fossils discovered should be collected along with relevant data, and should be cleaned, prepared, identified, and transferred to an approved repository.
- The results of the paleontological monitoring/mitigation effort should be analyzed and presented in a paleontological report prepared following BLM guidelines.

## **RANGELAND MANAGEMENT**

*Affected Environment:* The proposed well would affect only the Square S allotment (BLM 2007b). Table 12 shows parameters for the Square S allotment and Table 13 shows the total Animal Unit Months (AUMs) affected by the Proposed Action.

**Table 12. Project Area affected allotment.**

Allotment #	Allotment Name	Livestock		Authorized Use	% BLM	Total Acres	AUMs
		#	Kind				
06027	Square S	500	Cattle	5/16–6/10	96	79,551	410
		600	Cattle	6/11–11/30	18		178
		300	Cattle	10/16–12/15	96		578
		100	Cattle	12/16–5/15	96		477
		110	Cattle	5/1–12/15	96		795

**Table 13. Total Animal Unit Months (AUMs) affected by Proposed Action.**

Well Pad #	Allotment Name	Permanent Acres Lost for AUM	AUMs/Acre	Total AUMs Lost after Reclamation
41-1-298	Square S	6.3	0.03	0.19

*Environmental Consequences of the Proposed Action:* The Proposed Action would result in an immediate, short-term loss of 10.87 acres (0.33 AUM) of livestock forage and a long-term loss of approximately 6.3 acres (0.19 AUM) after reclamation. The removal of vegetation would also increase the potential for noxious weed infestations in the Project Area, impacting native sources of forage. However, disturbed areas previously dominated by pinyon-juniper woodland and reseeded with native grasses could provide additional forage for livestock.

*Environmental Consequences of the No Action Alternative:* Under the No Action Alternative there would be no additional impacts to livestock grazing in the Project Area.

*Mitigation:* All roadside and well location cut and fill slopes would be revegetated immediately after construction with the BLM-approved seed mixture(s). Revegetation operations would start immediately following the completion of recontouring/dirt work operations.

Reserve pit fencing would comply with BLM specifications as described in the BLM Gold Book, *Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development* (BLM 2006a). Reserve pit fence specifications would be included as part of the Conditions of Approval.

If construction/development occurs between April 15 and November 15, the Operator would be required to treat surface roads with water to reduce airborne dust and damage to roadside vegetation communities.

## REALTY AUTHORIZATIONS

*Affected Environment:* The creation of new pipeline and connections to the Ryan Gulch Gathering System would be required for this well. Bargath’s application for a 12 inch natural gas pipeline and two 8 inch water lines buried in the same trench would require an amendment to

right-of-way grant COC67991 and COC73180. The access road is on unit and would not require a right-of-way.

*Environmental Consequences of the Proposed Action* The proposed pipeline lengths and widths are as follows:

Well	Gas and Water Pipeline Length (ft)	Acres Disturbed with 60-ft Construction ROW	Acres Disturbed with 30-ft Permanent ROW
41-1-298	3,433	4.73	2.36

The proposed water lines would be constructed within the same trench as the natural gas pipeline. The length of the water lines would be 3,433 feet with a permanent width of 15 feet, encompassing 1.18 acres, more or less.

The Proposed Action would not include developing staging areas or temporary use areas on public land. Existing well sites are large enough to serve as temporary staging areas, with no new disruption expected. The access road would be used as the temporary work area during the construction of the pipeline and water lines.

*Environmental Consequences of the No Action Alternative:* Under the No Action Alternative, the application would be denied and the situation would remain the same.

*Mitigation:* Any applicable Conditions of Approval for the 41-1-298 wells would also apply. Amendments to any existing ROWs would retain terms, conditions, and stipulations of the original grant.

## RECREATION

*Affected Environment:* The Project Area is located within the White River Extensive Recreation Management Area (ERMA). The BLM manages the White River ERMA for unstructured recreation activities including hunting, dispersed camping, hiking, horseback riding, wildlife viewing, and off-highway vehicle use. BLM’s Recreation Opportunity Spectrum (ROS) classifies recreational opportunities on federal land based on elements of the setting, such as access and remoteness. The Proposed Action would not fall in an area classified by the ROS. The area along the White River, north of the Project Area, is classified as roaded natural, a setting with a natural appearance, but with maintained roads and a moderate number of people and human modifications.

A parcel of the Piceance Creek SWA is within 0.5 mile of the Project Area boundary. This SWA provides opportunities for camping, fishing, hunting, wildlife watching, and photography. Ryan Gulch is designated for Recreation Secondary Contact (CDPHE 2006b). These surface waters are suitable, or intended to become suitable, for recreational uses other than primary contact, such as fishing and other streamside recreation. The affected segment of Piceance Creek is designated for Recreation Primary Contact. These surface waters are suitable, or intended to

become suitable, for recreational activities such as swimming, rafting, kayaking, and water-skiing.

*Environmental Consequences of the Proposed Action:* The public would lose approximately 2.6 acres (well pad area only) of dispersed recreation potential on federal land while the well is in operation. Recreationists would likely avoid the well and disperse elsewhere within the White River ERMA. The recreational experience of hunters could be disrupted if construction occurs during hunting seasons (September through November). Increased traffic levels resulting from the proposed well pad and associated road could increase the likelihood of human interactions, increase the sights and sounds associated with the human environment, and create an environment that appears less natural.

*Environmental Consequences of the No Action Alternative:* The No Action Alternative would have no impact on recreation within the White River ERMA.

*Mitigation:* None.

## **VISUAL RESOURCES**

*Affected Environment:* BLM has developed the Visual Resource Management (VRM) system to evaluate and manage different levels of scenic values on public lands. Class I is the highest visual rating, while Class IV is the lowest rating. The proposed well pad, access road, and pipelines fall within a Class III area.

The purposes of VRM Class III areas are to partially retain the existing character of the landscape. Actions and activities may attract some attention but should not dominate the view. Management of Class III areas should attempt to minimize the impact of activities through careful location, minimal disturbance, and repeating the basic elements found in the predominant natural features of the landscape.

*Environmental Consequences of the Proposed Action:* The Proposed Action would modify the existing character of the landscape in the Project Area due to surface disturbance and new structures. People traveling through the Project Area may notice these visual changes. Most people traveling along unpaved roads in the area would be energy-related personnel, local ranchers, and seasonal big game hunters. The drilling activities may be seen temporarily, but would not dominate the view of these observers. The well would be located in a stand of pinyon-juniper and sagebrush habitat within a VRM Class III area. All above-ground facilities would be painted to mimic and blend with the surrounding vegetation. Interim reclamation and revegetation would also minimize visual disturbance in the Project Area during production. Therefore, the level of change to the characteristic landscape would be less than moderate and the objectives of the VRM III classification would be retained.

*Environmental Consequences of the No Action Alternative:* There would be no impacts to visual resources from the No Action Alternative.

*Mitigation:* All permanent (onsite for 6 months or longer) structures, facilities, and equipment placed onsite would be painted Munsell Soil Color Chart Juniper Green or equivalent within six months of installation.

**CUMULATIVE IMPACTS SUMMARY** The Proposed Action is consistent with the scope of impacts addressed in the White River ROD/RMP. The cumulative impacts of oil and gas activities are addressed in the White River ROD/RMP for each resource value that would be affected by the Proposed Action.

## REFERENCES CITED

- Andrews, R., and R. Righter. 1992. Colorado birds: a reference to their distribution and habitat. Denver Museum of Natural History, Denver.
- Black, C. C., and M. R. Dawson. 1966. A review of late Eocene mammalian faunas from North America: *American Journal of Science* v. 264, p. 321-349.
- Bureau of Land Management (BLM). 1985. BLM Manual 9113, Roads, Release 9-247. U.S. Department of the Interior.
- \_\_\_\_\_. 1992. BLM Manual 9015 Integrated Weed Management. Available online at <http://www.blm.gov/ca/st/en/prog/weeds/9015.html>. Accessed on June 8, 2007.
- \_\_\_\_\_. 1997a. Resource Management Plan, Final Environmental Impact Statement. White River Resource Area.
- \_\_\_\_\_. 1997b. White River Record of Decision and Approved Resource Management Plan. Available online at [http://www.co.blm.gov/nepa/rmpdocs/wrfodocs/White\\_River/Wrrr/Wrrr.pdf](http://www.co.blm.gov/nepa/rmpdocs/wrfodocs/White_River/Wrrr/Wrrr.pdf). Accessed on June 8, 2007.
- \_\_\_\_\_. 1998 (*revised*). Paleontology Resources Management Manual and Handbook H-8270-1.
- \_\_\_\_\_. 1999. White River Fire Management Plan Environmental Assessment. CO-017-WR-99-99-EA.
- \_\_\_\_\_. 2000. Colorado BLM State Director's Sensitive Species List. Available online at [http://www.blm.gov/co/st/en/BLM\\_Programs/botany/Sensitive\\_Species\\_List\\_.html](http://www.blm.gov/co/st/en/BLM_Programs/botany/Sensitive_Species_List_.html). Accessed June 6, 2007.
- \_\_\_\_\_. 2006a. The Gold Book. Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development.

- \_\_\_\_\_. 2006b. Chevron USA, Inc. Oil & Gas Oil Shale Research, Development and Demonstration Tracts Environmental Assessment. CO-110-2006-120.
- \_\_\_\_\_. 2006c. Shell Frontier Oil & Gas Oil Shale Research, Development and Demonstration Tracts Environmental Assessment. CO-110-2006-117.
- \_\_\_\_\_. 2007a. Topography and Physiography Report of North Western Colorado. Available online at <http://www.co.blm.gov/wrra/documents/TopographyandPhysiographyreportofNWCO.pdf>. Accessed on June 7, 2007.
- \_\_\_\_\_. 2007b. Geocommunicator. Available online at [www.geocommunicator.gov](http://www.geocommunicator.gov). Accessed July 9, 2007.
- Canton, S. P. No date. Written testimony of Steven P. Canton, GEI Consultants, Inc. on behalf of Shell Frontier Oil & Gas Inc. Responsive prehearing statement in the matter of the adoption of revised water quality classifications, standards and designations for multiple segments in the Upper Colorado River Basin and the North Platte River (Planning Region 12), Regulation #33 (5 CCR 1002-33) and in the Lower Colorado River Basin, Regulation #37 (5 CCR 1002-37).
- Colorado Decision Support Systems (CDSS). 2007. Water Rights Database. Available online at <http://cdss.state.co.us/DNN/WaterRights/tabid/76/Default.aspx>. Accessed on June 27, 2007.
- Colorado Department of Agriculture. No date. Rio Blanco County Noxious Weed List. Available online at <http://www.ag.state.co.us/NoxiousWeed/counties/RioBlanco.html>. Accessed January 2009.
- Colorado Department of Public Health and Environment (CDPHE). 2006a. Regulation Number 7: State-Wide Oil and Gas Controls Presentation to the Colorado Air Quality Control Commission.
- \_\_\_\_\_. 2006b. Status of Water Quality in Colorado – 2006, The Update to the 2002 and 2004 305(b) Reports. Prepared by the Water Quality Control Division.
- \_\_\_\_\_. 2007a. Air Quality Regulation Briefing for the Colorado Oil & Gas Conservation Commission.
- \_\_\_\_\_. 2008a. Regulation No. 37, Classifications and Numeric Standards for Lower Colorado River Basin. 5 CCR 1002-37.
- \_\_\_\_\_. 2008b. Colorado Regulation No. 93, 2006 303(d) List of Water-Quality-Limited Segments Requiring TMDLS. 5 CCR 1002-93.

- \_\_\_\_\_. 2008c. Colorado Regulation No. 94, 2006 Monitoring and Evaluation List of Water Bodies Identified for Additional Water Quality Evaluation. 5 CCR 1002-94. Effective April 30, 2008.
- Colorado Division of Wildlife (CDOW). 2008. Natural Diversity Information Source. Available online at <http://ndis.nrel.colostate.edu/wildlife.asp>. Accessed September 2008.
- Colorado Natural Heritage Program (CNHP). 2008. Survey of critical biological resources, Rio Blanco County, Colorado. Report prepared for Rio Blanco County, U.S. Environmental Protection Agency Region 18, and Colorado Division of Wildlife Wetlands Program. Internet: <http://www.cnhp.colostate.edu/reports.html>. Accessed September 23, 2008.
- Colorado School of Mines. 2007. The Piceance Basin and the Roan Plateau. Internet: [http://www.mines.edu/outreach/Cont\\_Ed/emfi2005/PiceanceRoan.pdf](http://www.mines.edu/outreach/Cont_Ed/emfi2005/PiceanceRoan.pdf). Accessed on June 7, 2007.
- Conner, C. E., and B. J. Davenport. 2006. Class III Cultural Resource Inventory Report for Twenty-one Proposed Ryan Gulch Well Locations and Related Access Routes in Rio Blanco County, Colorado. Prepared for Williams Production RMT by Grand River Institute. Submitted to the Bureau of Land Management -White River Field Office.
- Craig Interagency Dispatch Center. 2008. Northwest Colorado Fire Program Area Fire Management Plan. Available online at [http://gacc.nifc.gov/rmcc/dispatch\\_centers/r2crc/predictive/fuels\\_fire\\_danger/fuels\\_fire\\_danger.htm](http://gacc.nifc.gov/rmcc/dispatch_centers/r2crc/predictive/fuels_fire_danger/fuels_fire_danger.htm) Accessed December 2008.
- Duncan, D. C. 1976a. Preliminary Geologic Map of Wolf Ridge Quadrangle, Rio Blanco County, Colorado: *U.S. Geological Survey Miscellaneous Field Studies Map MF-753* (1:24,000).
- \_\_\_\_\_. 1976b. Preliminary Geologic Map of Square S Ranch Quadrangle, Rio Blanco County, Colorado: *U.S. Geological Survey Miscellaneous Field Studies Map MF-754* (1:24,000).
- \_\_\_\_\_. 1976c. Preliminary Geologic Map of Rock School Quadrangle, Rio Blanco County, Colorado: *U.S. Geological Survey Miscellaneous Field Studies Map MF-757* (1:24,000).
- \_\_\_\_\_. 1976d. Preliminary Geologic Map of Yankee Gulch Quadrangle, Rio Blanco County, Colorado: *U.S. Geological Survey Miscellaneous Field Studies Map MF-758* (1:24,000).
- Energy Efficiency and Renewable Energy. 2007. Guide to Tribal Energy Development: Uintah and Ouray Indian Reservation. Available online at [http://www.eere.energy.gov/tribalenergy/guide/pdfs/uintah\\_ouray.pdf](http://www.eere.energy.gov/tribalenergy/guide/pdfs/uintah_ouray.pdf). Accessed on June 7, 2007.
- Environmental Protection Agency (EPA). 2004. Evaluation of Impacts to Underground Sources of Drinking Water by Hydraulic Fracturing of Coalbed Methane Reservoirs, Attachment 3 – The Piceance Basin.

- Hail, W. J., Jr. 1984. Geologic Map of the Barcus Creek Quadrangle, Rio Blanco County, Colorado: *U.S. Geological Survey Geologic Quadrangle Map GQ-1578* (1:24,000).
- Hail, W. J., Jr., and M. C. Smith. 1994. Geologic map of the northern part of the Piceance Creek Basin, northwestern Colorado: *U.S. Geological Survey Map I-2400*.
- \_\_\_\_\_. 1997. Geologic map of the southern part of the Piceance Creek Basin, northwestern Colorado: *U.S. Geological Survey Map I-2529*.
- Hammerson, G. 1999. *Amphibians and Reptiles of Colorado; A Colorado Field Guide*. Second Edition. University Press of Colorado and Colorado Division of Wildlife. Niwot, Colorado.
- Kingery, H. (ed.). 1998. *Colorado breeding bird atlas*. Colorado bird atlas partnership and Colorado Division of Wildlife, Denver.
- Murphey, P. C., and E. Evanoff. 2006. Stratigraphy, fossil distribution and depositional environments of the upper Bridger Formation (middle Eocene), southwestern Wyoming: *Wyoming State Geological Survey Memoir*.
- North American Bird Conservation Initiative (NABCI). 2008. Bird Conservation Regions. Available online at <http://www.nabci-us.org/bcrs.html>. Accessed September 2008.
- Righter, R., R. Levad, C. Dexter, and K. Potter. 2004. *Birds of western Colorado plateau and mesa country*. Grand Valley Audubon Society, Grand Junction.
- Robinson, P. 1978. Paleontological resources inventory and evaluation, Bureau of Mines Experimental Oil Shale Mine, Rio Blanco County, Colorado: Prepared for VTN Colorado, Inc. 2600 S. Parker Rd., Aurora, Colorado, 22 pp.
- Robson, S. G., and E. R. Banta. 1995. *Ground Water Atlas of the United States*. USGS Publication HA 730-C. Arizona, Colorado, New Mexico, Utah.
- Schwendler, Rebecca, Sarah Baer, Karen Reed, Scott Phillips, Scott Slessman, Matthew Bandy, Nicole Kromarek, Scott Bowen, Max Wolk, Cary M. Berg, Paul Burnett, Tom Witt, Sean Doyle, Michelle Delmas, Michael Cregger, John Kennedy, Judy Cooper, Zonna Barnes, Amanda Cohen, Cynthia Manseau, Michael Retter, Dan Shosky and Erin Salisbury. 2008. *A Class III Cultural Resource Inventory for the Ryan Gulch 3-D Geophysical Exploration project*, Rio Blanco, Colorado. SWCA Environmental Consultants, Broomfield Colorado.
- Southwest Regional Gap Analysis Program (SWReGAP). 2007. Southwest Regional Gap Analysis Project 'PROVISIONAL' Landcover and Related Datasets. Internet: <http://earth.gis.usu.edu/swgap/>. Accessed on June 4, 2007.

- Spackman, S., B. Jennings, J. Coles, C. Dawson, M. Minton, A. Kratz, and C. Spurrier. 1997. Colorado Rare Plant Field Guide. Prepared for the Bureau of Land Management, the U.S. Forest Service and the U.S. Fish and Wildlife Service by the Colorado Natural Heritage Program.
- SWCA Environmental Consultants (SWCA). 2008. Raptor inventory report for the Williams Ryan Gulch Project, Rio Blanco County, Colorado. Report prepared for BLM White River Field Office, Meeker, CO.
- Taylor, O. J. 1987. Hydrologic System of Piceance Basin, in Taylor, J., ed., Oil Shale, Water Resources, and Valuable Minerals of the Piceance Basin, Colorado: The Challenge and Choices of Development. US Geol. Surv. Prof. Paper 1310.
- Tobin, R. L. 1987. Water Quality in the Piceance Basin, in Taylor, J., ed., Oil Shale, Water Resources, and Valuable Minerals of the Piceance Basin, Colorado: The Challenge and Choices of Development. US Geol. Surv. Prof. Paper 1310.
- Townsend, K. E. 2004. Stratigraphy, paleoecology, and habitat change in the middle Eocene of North America: *Unpublished dissertation, Washington University*, 418 pp.
- U.S. Department of Agriculture (USDA). 1982. Soil Survey of Rio Blanco County Area Colorado.
- \_\_\_\_\_. 2003. Colorado State-Listed Noxious Weeds. Available online at <http://plants.usda.gov/java/noxious/>. Accessed June 4, 2007.
- U.S. Fish and Wildlife Service (USFWS). 2002. Birds of conservation concern 2002. Division of Migratory Bird Management, Arlington, Virginia. Available online at <http://migratorybirds.fws>.
- \_\_\_\_\_. 2007a. Endangered and Threatened Wildlife and Plants; Removing the Bald Eagle in the lower 48 States from the List of Endangered and Threatened Wildlife. *Federal Register* 50 CFR Part 17, July 9, 2007.
- \_\_\_\_\_. 2007b. Draft post-delisting monitoring plan for the bald eagle (*Haliaeetus leucocephalus*). U.S. Fish and Wildlife Service Bald Eagle Monitoring Team.
- \_\_\_\_\_. 2007c. U.S. Fish and Wildlife Service Species Assessment and Listing Priority Assignment Form. Yellow-billed Cuckoo, Western United States Distinct Population Segment. Available online at <http://ecos.fws.gov/speciesProfile/SpeciesReport.do?scode=B06R> Accessed August 2008.
- \_\_\_\_\_. 2008. Endangered, Threatened, Proposed and Candidate Species, Colorado Counties, March 2008. Available online at <http://www.fws.gov/mountain-prairie/co.html>. Accessed September 2008.

United States Forest Service (USFS). 1996. Potential fossil yield classification (PFYC):  
 Developed by the Paleontology Center of Excellence and the Region 2 (USFS) Paleo  
 Initiative.

Walsh, S. L. 1996. Middle Eocene mammalian faunas of San Diego County, California. In: D. R.  
 Prothero and R. J. Emry (eds.): The Terrestrial Eocene-Oligocene Transition in North  
 America. Cambridge: *Cambridge University Press*: 75-119.

Welder, F. A. 1987. Unconsolidated Deposits of the Piceance Basin, in Taylor, J., ed., Oil Shale,  
 Water Resources, and Valuable Minerals of the Piceance Basin, Colorado: The Challenge  
 and Choices of Development. US Geol. Surv. Prof. Paper 1310.

**PERSONS / AGENCIES CONSULTED:** None.

**INTERDISCIPLINARY REVIEW:**

<b>Project Team</b>		
<b>Name</b>	<b>Title</b>	<b>Area of Responsibility</b>
<b>BLM Oversight</b>		
Jim Michels	Fuels and Fire	Visual Resource Management
Paul Daggett	Mining Engineer	Geology and Minerals
Brett Smithers	Wildlife Biologist	Project Lead, Migratory Birds; Threatened, Endangered and Sensitive Animal Species; Wildlife; Wetlands and Riparian Zones
Maggie Marston	Botanist	Areas of Critical Environmental Concern; Threatened and Endangered Plant Species
Jim Michels/	Fuels and Fire	Recreation; Wilderness; Access and Transportation
Mark Hafkenschiel	Rangeland Management	Vegetation; Invasive, Non-Native Species; Rangeland Management
Mike Selle	Archeologist	Cultural and Paleontological Resources
Bob Lange	Hydrologist	Air Quality; Water Quality, Surface and Ground; Hydrology and Water Rights; Wastes, Hazardous or Solid and Soils.
Stacey Burke	Realty Specialist	Realty Authorizations
Scott Nilson	Range Tech-Fire	Fire Management, Forest Management
Melissa Kindall	Range Tech	Wild Horses

<b>Project Team</b>		
<b>Name</b>	<b>Title</b>	<b>Area of Responsibility</b>
<b>SWCA (Third-Party Contractor)</b>		
Larry Semo	Senior Scientist	Senior Review, all areas; Migratory Birds; Threatened, Endangered and Sensitive Animal Species; Wildlife, Terrestrial and Aquatic.
Chad Baker	Environmental Specialist	Migratory Birds; Threatened, Endangered and Sensitive Animal Species; Wildlife, Terrestrial and Aquatic; Areas of Critical Environmental Concern; Wastes, Hazardous or Solid; Threatened and Endangered Plant Species; Invasive, Non-Native Species; and Vegetation.
Hillary Browning	Water Resources Specialist/Planner	Air Quality; Water Quality, Surface and Ground; Hydrology and Water Rights; Geology and Minerals; Soils; Access and Transportation; Visual Resources; Forest Management; Wetlands and Riparian Zones; Fire Management; and Rangeland Management.

## **Finding of No Significant Impact/Decision Record (FONSI/DR)**

### **DIO-BLM-CO-110-2009-0035-EA**

**FINDING OF NO SIGNIFICANT IMPACT (FONSI)/RATIONALE:** The environmental assessment and analysis of the environmental effects of the Proposed Action have been reviewed. The approved mitigation measures (listed below) result in a Finding of No Significant Impact on the human environment. Therefore, an environmental impact statement (EIS) is not necessary to further analyze the environmental effects of the Proposed Action.

SWCA Environmental Consultants (SWCA), an environmental consulting firm, with the guidance, participation, and independent evaluation of the Bureau of Land Management (BLM), prepared this document. The BLM, in accordance with 40 CFR 1506.5 (a) and (c), is in agreement with the findings of the analysis and approves and takes responsibility for the scope and content of this document.

**DECISION/RATIONALE:** It is my decision to approve the proposed action with the mitigation measures listed below.

**MITIGATION MEASURES:** Mitigation required for this project is discussed below for each resource for which mitigation is warranted.

1. Operator committed mitigation measures include the following:
  - All access roads and surface-disturbing activities will conform to standards outlined in the BLM Gold Book, *Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development*.
  - Cleared woodland fuels from the well pad would be stockpiled away from combustible structures and materials used during drilling. Cleared woodland fuels from the access road and pipeline ROWs would be placed back on the ROWs immediately following construction and seeding. Those fuels would be evenly scattered along the ROWs to avoid fuel jackpots. Topsoil would be stockpiled on the edge of the well pad for later reclamation use. Shredded vegetation material would be used for stabilization of the topsoil stockpile. All roadside and well location cut and fill slopes would be revegetated immediately after construction with the seed mixture(s) specified in the Conditions of Approval.
  - All reserve pits will be designed and fenced to BLM specifications. These specifications will be provided to the Operator as part of the Conditions of Approval. Produced waste water will be confined to the pit for a period of 90 days after initial production. During the 90-day period the required waste analysis will be submitted for the Authorized Officer's (AO's) approval, pursuant to Onshore Oil and Gas Order No. 7 (NTL-2B). A

permanent steel tank will be installed in the ground next to the production facilities to store produced water before final disposal.

- The reserve pit will be allowed to evaporate, pumped out and disposed of, and then backfilled. The backfilling of the reserve pit will be done in such a manner that the mud and associated solids will be confined to the pit and not squeezed out and incorporated into the surface materials. There will be a minimum of 3 feet of cover (overburden) on the pit.
- All remaining cuttings will be solidified and buried in place, or disposed of in an approved manner. The stockpiled ground cover will be evenly distributed over the disturbed areas. The recommended seed mix to be used on all disturbed areas will be determined by the WRFO. The dirt contractor will be provided with an approved copy of the surface use plan.
- The Operator will construct a temporary lined pit to store frac water while completing the well. The frac pit will be reclaimed immediately following completion.
- Chemical pesticides or any other control agent that represents a potential soil, air, or water pollutant will not be utilized for any purpose on public lands without express written authorization from the AO.
- The Operator or his contractor will notify the BLM 48 hours before starting reclamation work that involves earth-moving equipment and upon completion of restoration measures.

2. Mitigation required for air quality includes the following:

- All access roads will be maintained according to BLM Manual Section 9113 standards for road shape and drainage features at all times during construction, drilling, completion and production of the wells.
- All access roads will be treated with water and/or a dust suppressant during construction and drilling activities so that there is not a visible dust trail behind vehicles. All vehicles will abide by company or public speed restrictions during all activities. If water is used as a dust suppressant, there will be no traces of oil or solvents in water. Only water needed for abating dust will be applied; dust abatement will not be used as a water disposal option under any circumstances.
- Vehicle speeds will be limited on associated access roads to 15 miles per hour (mph), or another appropriate limit, and applying a BLM-approved dust suppressant during dry periods when dust plumes are visible.
- Land clearing, grading, earth moving, and excavation activities will be suspended when wind speed exceeds 20 mph or as needed to prevent dust plumes.

3. Mitigation required for cultural resources includes the following:

- The Operator is responsible for informing all persons who are associated with the project operations that they will be subject to prosecution for knowingly disturbing historic or archaeological sites, or for collecting artifacts.
- If subsurface features are located during clearing of the well pad location, access road, or well tie in pipeline, all construction on the well pad will cease immediately. The AO will be notified immediately. Within five working days the AO will inform the Operator as to:
  - Whether the subsurface features or materials found during construction appear eligible for the National Register of Historic Places.

- The mitigation measures the Operator will likely have to undertake before the site can be used (assuming that in situ preservation is not necessary).
  - A timeframe for the AO to complete an expedited review under 36 CFR 800-11 to confirm, through the State Historic Preservation Officer, that the findings of the AO are correct and that the mitigation is appropriate.
  - At any time, if the Operator wishes to relocate the construction activities to avoid the expense of mitigation and/or the delays associated with the process, the AO will take on the responsibility of recording and/or stabilizing the exposed materials, if required. Mitigation technical guidelines and procedures will be provided by the AO. The Operator may resume construction once the AO has verified that mitigation is complete.
  - Pursuant to 43 CFR 10.4 (g) the Operator will notify the AO, by telephone or with written confirmation, immediately upon the discovery of human remains, funerary items, sacred objects, or objects of cultural patrimony. Pursuant to 43 CFR 10.4 (c) and (d), the Operator will stop activities in the vicinity of the discovery and protect it for 30 days or until notified to proceed by the AO.
4. For mitigation of noxious weeds, the Operator will be responsible for certain activities. Materials and methods will be approved in advance by the AO. These activities include the following:
- The Operator will be required to monitor the Project Area for the life of the project and eradicate all noxious weeds and cheatgrass that occur on-site using materials and methods approved in advance by the AO.
  - As the Project Area will occur in a BLM dedicated Weed-Free Zone, the Operator will conduct all surface activities in accordance with the BLM Manual 9015 - Integrated *Weed Management* (BLM 1992) and the BLM *White River Resource Management Plan*, Appendix B, Management of Noxious Weeds.
  - Conduct pre-construction surveys for noxious weed infestations within the site boundaries and along access roads. Surveys will be conducted in spring.
  - Consult with to determine treatment for noxious weeds, if identified.
  - Construction vehicles and equipment will be cleaned, power-washed, and free of soil and vegetation debris prior to entry and use of access roads to prevent transporting weed seeds.
  - All seed mix, erosion control materials, and reclamation materials will be certified weed free.
  - Revegetated areas will be monitored for at least 3 years following seeding to evaluate the need for supplemental seeding and noxious weed control.
  - The ROW and other disturbed areas will be monitored for noxious weed infestations, and new or expanding populations will be controlled or eradicated for the duration of the construction, operation, and reclamation phases.
  - The presence of Class C weeds in the Project Area requires that the Operator develop and implement management measures to prevent the spread of noxious weeds and install a monitoring system for a minimum of 3 years.
  - Materials and methods will be approved in advance by the AO.
5. The following are mitigation for threatened, endangered, and sensitive species:

- If future raptor inventory surveys document the occurrence of one or more breeding pairs of BLM-sensitive raptors nesting within the project area, future soil-disturbing activities, drilling, well completion, workover and reclamation activities associated with this action will be subject to the White River ROD/RMP-approved No Surface Occupancy stipulation NSO-02, which disallows surface occupancy within 0.25 mile of identified functional nests. In addition, disruptive activity (i.e., surface-disturbing, and drilling and completion-related activities) will be disallowed within 0.5 mile of listed and BLM-sensitive species raptor nests from February 1 through August 15 (TL-01).
6. The following are mitigation for waste:
- The Operator will watch for signs of hazardous or solid wastes throughout excavation and operations within the Project Area and, if found, will take the appropriate reporting and mitigation measures to protect the public and workers.
  - The Operator will submit a Sundry Notice Form 3160-5 indicating the method for disposing of produced water during production as per Onshore Order #7 timing and requirements.
  - The Operator will submit an updated SPCC plan that includes this site to the BLM for our project files.
  - The release of any chemical, oil, petroleum product, produced water, or sewage, etc. (regardless of quantity) must be reported by the lease holder, to the Bureau of Land Management – WRFO Hazardous Materials Coordinator at (970) 878-3800.
  - The Operator will comply with all applicable federal laws and regulations existing or hereafter enacted or promulgated. In any event, the Operator will comply with the Toxic Substances Control Act of 1976, as amended (15 USC 2601, et seq.) with regard to any toxic substances that are used, generated by or stored on the ROW or on facilities authorized under this ROW grant. (See 40 CFR, Part 702-799 and especially, provisions on polychlorinated biphenyls, 40 CFR 761.1-761.193.) Additionally, any release of toxic substances (leaks, spills, etc.) in excess of the reportable quantity established by 40 CFR, Part 117 will be reported as required by the CERCLA, Section 102b. A copy of any report required or requested by any federal agency or state government as a result of a reportable release or spill of any toxic substances will be furnished to the AO concurrent with the filing of the reports to the involved federal agency or state government.
7. The following are mitigation for water quality:
- Provide for erosion-resistant surface drainage by adding necessary drainage facilities and prior to rain or snow events. When erosion in disturbed areas is anticipated, sediment barriers will be constructed to slow runoff, allow deposition of sediment, and prevent it from leaving the site.
  - If erosion features such as riling, gullyng, piping and mass wasting occur along the pipeline right-of-way at anytime in the future these erosion features will be addressed immediately after observation by contacting the AO and submitting a reclamation plan with BMPs to address the erosion problems.
  - Locate culverts or drainage dips (waterbreaks) to avoid discharge onto unstable terrain such as headwalls or slumps. Provide adequate spacing of these drainage features to avoid accumulation of water in ditches or road surfaces. Monitor culvert installations to

ensure proper placement and adequate armoring of inlets and outlets. Patrol areas susceptible to road or watershed damage during periods of high runoff.

- Keep road inlet and outlet ditches, catchbasins, and culverts free of obstructions, particularly before and during spring runoff. Routine machine-cleaning of ditches will be kept to a minimum during wet weather. Leave the disturbed area in a condition that provides drainage with no additional maintenance.
- The new access roads will be built and maintained to BLM Manual Section 9113 standards for road shape and drainage features. Culverts and waterbars will be installed according to 9113 standards and sized for the 10-year storm event with no static head and to pass a 25-year event without failing.
- For the access road and the pad, the Operator will include via Sundry notice a detailed drainage plan including any BMPs that will be installed for the Operator's stormwater management plan. This plan will be reviewed by the WRFO Hydrologist and approved by the AO before construction. The plan will describe:
  - Construction methods planned for addressing on-site erosion to meet the Operator's stormwater discharge permit requirements.
  - Soil analysis indicating the gravel will not be required to provide an all-weather surface for this access road **or** design specification and source of gravel to make this an all-weather access road needed for winter drilling.
  - Locations for implementing methods for stabilizing disturbed areas after drilling and proposed maintenance. This description of stabilization methods will include seed mix, seeding rate, and method for mulching and stabilizing (i.e., erosion fabric, tackifier or other method).
  - Culverts, low-water crossings, and/or waterdips with the sizing and placement noted.
- A Reclamation Status Report will be submitted to the WRFO biannually for all actions that require disturbance of surface soils on BLM-administered lands as a result of the proposed action. Actions may include, but are not limited to, well pad and road construction, construction of ancillary facilities, or power line and pipeline construction. The Reclamation Status Report will be submitted by **15 April** and **15 August** of each calendar year, and will include the well number, API number, legal description, project description (e.g., well pad or pipeline), reclamation status (e.g., interim or final), whether the well pad or pipeline has been re-vegetated and/or re-contoured, date seeded, photos of the reclaimed site, estimate of acres seeded and seeding method (e.g., disk-plowed, drilled, or both). Internal and external review of this report and the process used to acquire the necessary information will be conducted annually, and new information or changes in the reporting process will be incorporated into the report. The Reclamation Status Report will be submitted electronically via email as a Microsoft Excel table to Natural Resource Specialist, Brett Smithers (brett\_smithers@blm.gov).
- In an attempt to track interim and final reclamation of federal actions related to the development of federal mineral resources, the Operator is asked to submit Geographic Information System (GIS) data to the White River Field Office (WRFO) for any post construction (i.e., "as-built") polygon feature that was included in the Application for Permit to Drill (APD) and associated with the proposed action. GIS polygon features may include, but are not limited to, constructed access roads, existing roads that were

upgraded, pipeline corridors, and the well pad footprint. Geospatial data will be submitted as ArcView datasets (i.e., shapefiles or features), ArcInfo coverages, or as ArcView compatible data files (e.g., AutoCAD export .dwg files). All AutoCAD files must include the projection information and/or spatial (datum) reference to allow import into a spatially referenced GIS format. The preferred spatial reference for AutoCAD .dwg files is State Plane, Colorado North, NAD83, feet. GIS data will be submitted electronically to BLM, WRFO Natural Resource Specialist, Brett Smithers (brett\_smithers@blm.gov; Phone: [970] 878-3818) using the 1983 Geographic Coordinate System (NAD 83 datum). These data will be submitted within 24 hours from the time when construction-related activities have ended for all geographic features associated with the proposed action. If the Operator is unable to send the data electronically, the Operator will submit the data on compact disk(s) to:

BLM, White River Field Office  
220 East Market Street  
Meeker, Colorado 81641  
Attn: Brett Smithers

If for any reason the location or orientation of the geographic feature associated with the proposed action changes, the Operator is asked to submit updated GIS data to BLM, WRFO within 7 days of the change, and this information should be submitted via Sundry Notice.

8. The following are committed wetland and riparian mitigation measures:
  - Install and maintain erosion control structures and bank stabilization to minimize potential for sediment runoff into surface waters or drainages.
  - Prohibit storage of hazardous materials, chemicals, fuels, lubricating oils, concrete coating, and refueling activities within 200 feet of wetland or riparian areas.
  - Minimizing soil compaction and furrowing by using mats or wide tire/low ground pressure equipment for construction activities within riparian zones (if necessary).
  - Completing all construction activities in riparian area during no-flow period.
  - Limiting grading, topsoil segregation, and excavation to the area immediately over the trenchline and directly within the footprint of the well pad to avoid excessive disruption of soils and the native seed and rootstock within the soils.
  - Performing routine daily inspections on equipment and vehicles to identify leaks and initiate corrective actions.
  - Managing all soil materials such that erosion and sediment transport are minimized.
  - Revegetating disturbed areas with BLM-approved seed mixes as soon as practical following disturbance.
  
9. The following are committed vegetation mitigation measures:
  - If construction/development occurs between April 15 and November 15, the Operator will be required to water or surface access roads to reduce airborne dust and damage to roadside vegetation communities.
  - The Operator will promptly revegetate all disturbed areas not necessary for production, including roadside and well pad cut and fill slopes, with a seed mix approved by the

BLM. This may mean broadcast seeding and hand raking with Native Seed mixture #3 as presented below.

Species (Variety)	Pure Live Seed (PLS) pounds per acre
Western wheatgrass (Rosanna)	2
Bluebunch wheatgrass (Whitmar)	2
Thickspike wheatgrass (Critana)	1
Indian ricegrass (Rimrock)	2
Fourwing saltbush (Wytana)	1
Utah sweetvetch	1
Alternates: Needle-and-thread, globemallow	
<b>TOTAL</b>	<b>9.0</b>

- All seed tags will be submitted to the designated NRS within 24 hours from the time the seeding activities have ended via Sundry Notice. The sundry will include the well or well pad number associated with the seeding activity, the name of the contractor that performed the work, his or her phone number, an estimate of the total acres seeded, and the date the seed was applied.
- Revegetation will commence immediately after construction and will not be delayed until the following fall. Drill seeding is the preferred method of application. Debris will not be scattered on the pipeline until after seeding operations are completed.
- The Operator will be responsible for excluding livestock grazing from all reclaimed portions of well pads. To eliminate livestock utilization of reclaimed areas prior to successful reclamation, a barbed wire fence built to BLM specifications will be constructed around all reclaimed portions of the well pad including cut and fill slopes immediately after interim reclamation is concluded (within 2 weeks) unless otherwise instructed by the BLM. A BLM specified cattleguard will be placed at the time of fence construction where the well access road bisects the fence line that surrounds the well pad's disturbance imprint. Once reclaimed plant species are fully established on disturbed sites as determined by the BLM (e.g., Desired Plant Community, Public Land Health Standards), the fence and cattle guard will be completely removed by the applicant after a minimum of two growing seasons. This will allow for reclaimed plant species to establish without grazing pressure from livestock.
- The Operator will be responsible for achieving a reclamation success rate for interim reclamation and final abandonment (on all disturbed areas associated with the well pad, pipeline, and access road) of sufficient vegetative ground cover from reclaimed plant species within three growing seasons after the application of seed. Additional reclamation efforts will be undertaken at the Operators expense. Reclamation achievement will be evaluated using the Public Land Health Standards that include indicators of rangeland health. Rehabilitation efforts will be repeated if it is concluded that the success rate is below an acceptable level as determined by the BLM.

10. The following are committed general wildlife mitigation measures:

- Reserve pits will be appropriately designed, as shown in the BLM Gold Book, *Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development* to prevent access by persons, wildlife, or livestock. Fencing, netting, or

other methods may be required in order to prevent access and mortality of birds and other animals.

- The Operator will be responsible for implementing mitigation measures that minimize bird injuries or mortality as a result of contact with produced water or other toxic substances in the reserve pit. The most effective measure currently being used includes the use of netting to cover the pit. The use of plastic balls that float on the surface and reduce the area that might be perceived by waterfowl as a place to rest and/or forage has also been used in certain circumstances, with limited results. The use of plastic flagging has proven to be ineffective at deterring use by migratory waterfowl for foraging, resting or as a source of free water, and its use is strongly discouraged. The Operator will notify WRFO Natural Resource Specialist, Brett Smithers via Email (brett\_smithers@blm.gov) or by phone ([970] 878-3818) of the method that will be used to prevent impacts to birds two weeks prior to the date when completion activities are expected to begin. In addition, the Operator will submit a Sundry Notice describing the proposed method used to deter use of migratory birds. The BLM-approved method will be applied within 24 hours after completion activities have begun. All lethal and non-lethal events that involve migratory birds will be reported to the Petroleum Engineer Technician immediately.
- If future raptor inventory surveys document the occurrence of one or more breeding pairs of BLM non-sensitive raptors nesting within the project area, future soil-disturbing activities, drilling, well completion, workover and reclamation activities associated with this action will be subject to the White River ROD/RMP-approved No Surface Occupancy stipulation NSO-03, which disallows surface occupancy within 1/8 mile of identified functional nests. In addition, disruptive activity (i.e., surface-disturbing, and drilling and completion-related activities) will be disallowed within 0.25 mile of listed and BLM-sensitive species raptor nests from February 1 through August 15.
- BMPs will be used throughout the life of the project to avoid stormwater pollution. Disturbed areas, except areas reasonably needed for production operations, will be reclaimed as early and as nearly as practicable to their original condition and will be maintained to control dust and minimize erosion and salt loading to nearby surface waters.
- Activities that may disrupt big game behavior or habitat utility during sensitive time frames will be subject to timing limitations (December 1 through April 30) on severe winter ranges, as directed by the White River ROD/RMP. This stipulation applies to all surface disturbing activities.
- To help monitor possible impacts to big game and raptors as result of drilling, completion, and well maintenance (i.e., work-over) activities, the Operator will notify the designated NRS the day the drilling rig moves on to the location and inform him or her of the move. In addition, the Operator will notify the designated NRS within 24 hours from the time the drilling rig moves off the location, when the completion rig moves on to the location and when the completion rig moves off the location. Well maintenance operations will also be reported to the designated NRS within 24 hours from the time the work-over rig moves on to the location and when the work-over rig moves off the location.

11. Mitigation measures for access and transportation include the following:

- Use of a construction yard as the primary parking for personal vehicles.
- Encouragement and/or arrangement for employees and contractors to carpool to and from the site.
- Controlling dust along unsurfaced access roads and minimizing the tracking of mud onto paved roads.
- Post-construction restoration of unsurfaced roads to equal or better than conditions that existed before construction.

12. The following are committed fire and safety mitigation measures:

- The Operator will be responsible for developing a fire management plan as an integral part of the overall safety plan. In the case of an incident, the Operator will immediately notify the BLM via Craig Interagency Dispatch 970-826-5037. No suppression actions will be taken on naturally ignited fires until meeting with the incident commander for any given incident. Further mitigation of impacts to the fire cycle will be achieved through management practices including:
  - Notify the BLM, and affected landowners, of any fires during construction, maintenance, or operation.
  - Inform site personnel of fire prevention practices concerning smoking materials, welding, etc., and make hand tools available, including shovels and fire extinguishers, for fire control.
  - Furnish all motor vehicles and equipment with fire-extinguishing equipment and stage fire fighting equipment and water tanks on-site in readily accessible areas.
  - Fire suppression equipment will not include the use of heavy equipment such as bulldozers or road graders. The applicant may initially attempt to suppress human caused fires from the result of activities related to construction of proposed project. If fire extinguishers are used to suppress any fire, the applicant and all associated contractors must notify the responding firefighters and Craig Interagency Dispatch Center of such use.
  - Construct defensible space as necessary and determine design criteria in coordination with BLM fire staff.
  - Perform all welding activities in areas where vegetation and other flammable materials have been removed.
  - Redistribute large, woody material salvaged during clearing operations on WRFO administered lands and disperse materials over the portion of the ROW from which the trees and brush were originally removed to meet fire management objectives (not to exceed 20 percent total ground cover for woody debris) and to provide wildlife habitat, seedling protection, and deter vehicular traffic.
  - Refer to the 2008 Northwest Colorado Fire Program Area Fire Management Plan for additional mitigation requirements.

13. The following are committed forest management measures:

- All trees removed in the process of construction will be purchased from the BLM. The trees will be cut at a maximum stump height of 6 inches and disposed of by one of the following methods:
  - Purchased trees could be removed from federal land for resale or private use.

- The stockpiled ground cover will be evenly distributed over the disturbed areas not to exceed 20 percent total ground cover for woody debris. The recommended seed mix to be used on all disturbed areas will be determined by the WRFO. The dirt contractor will be provided with an approved copy of the surface use plan.
- Vegetative material and topsoil will be stockpiled and used for reclamation. All cut and fill slopes will be revegetated immediately after construction with the seed mixture(s) specified in the Conditions of Approval.
- A hydro-ax or other mulching type machine could be used to remove the trees. The machines are capable of shredding trees up to 12 inches in diameter and 15 feet tall as well as mowing brush like a conventional brush beater. It generally leaves small branches and pieces of wood from pencil size up to bowling ball size and the mulch is evenly scattered across the surface. This would effectively breakdown the woody fuel and scatters the debris thereby eliminating any hazardous fuel load adjacent to the new road and well pad. If this type of tree removal is used, enough vegetation will be stock piled to adequately cover 20% of the surface for the well pad and stock pile the material adjacent to the top soil stock pile. Additionally, retain enough trees which are limbed and have root wads intact to adequately cover 20% of the surface for the pipeline disturbance. Material brought back onto the pipeline r-o-w should be evenly scattered, so as to not create jackpots of fuel.

14. The following are committed hydrology and water rights mitigation measures:

- An estimate of the volumes of water that will be used for construction, drilling, completion, fracing, dust abatement, and the final source of drilling waters will be provided to the WRFO hydrologist before drilling begins.

15. Potential adverse impacts on paleontological resources will be mitigated to below the level of significance by implementing the following programmatic mitigation measures. It is not necessary to monitor low sensitivity Holocene-age alluvium that is thicker than the depth of the proposed surface disturbance.

- The Operator is responsible for informing all persons who are associated with the project operations that they will be subject to prosecution for knowingly disturbing paleontological sites, or for collecting fossils. If fossil materials are uncovered during any project or construction activities, the Operator will immediately stop activities in the immediate area of the find that might further disturb such materials, and immediately contact the AO. Within five working days the AO will inform the Operator as to:
  - Whether the materials appear to be of noteworthy scientific interest.
  - The mitigation measures the Operator will likely have to undertake before the site can be used (assuming in situ preservation is not feasible).
- If the Operator wishes, at any time, to relocate activities to avoid the expense of mitigation and/or the delays associated with this process, the AO will assume responsibility for whatever recordation and stabilization of the exposed materials may be required. Otherwise, the Operator will be responsible for mitigation cost. The AO will provide technical and procedural guidelines for the conduct of mitigation. Upon verification from the AO that the required mitigation has been

completed, the Operator will then be allowed to resume construction.

- The following measures will be implemented in lieu of pre-construction paleontological field surveys wherever rocks of the Uinta Formation will be disturbed:
  - Museum record searches will be conducted to 1) determine whether any known fossil localities occur within the study area; 2) assess the potential for disturbance of these localities during construction; and 3) further evaluate the paleontological sensitivities of the Uinta Formation within the study area.
  - A qualified paleontological monitor, under the supervision of a qualified and BLM-permitted Principal Investigator (PI), will be on-site during all construction activities to systematically inspect bedrock exposed during ground disturbance, thus facilitating fossil discovery and salvage. If the paleontological sensitivity of the rocks within the Project Area is deemed to be less than anticipated by the PI after monitoring has commenced, the PI will have the authority to downgrade the sensitivity of the Project Area or portions therein, thus reducing the level of the monitoring effort to spot checking or clearance.
  - All fossils discovered will be collected along with relevant data, and will be cleaned, prepared, identified, and transferred to an approved repository.
  - The results of the paleontological monitoring/mitigation effort will be analyzed and presented in a paleontological report prepared following BLM guidelines.

16. Mitigation measures for rangeland will include the following:

- All roadside and well location cut and fill slopes will be revegetated immediately after construction with the BLM-approved seed mixture(s). Revegetation operations will start immediately following the completion of recontouring/dirt work operations.
- Reserve pit fencing will comply with BLM specifications as described in the BLM Gold Book, *Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development*. Reserve pit fence specifications will be included as part of the Conditions of Approval.
- If construction/development occurs between April 15 and November 15, the Operator will be required to treat surface roads with water to reduce airborne dust and damage to roadside vegetation communities.

17. Realty mitigation will include the following:

- Any applicable Conditions of Approval for the 41-1-298 wells will also apply. Amendments to any existing ROWs will retain terms, conditions, and stipulations of the original grant.

18. Visual resources mitigation will include the following:

- All permanent (on-site for 6 months or longer) structures, facilities, and equipment placed on-site will be painted Munsell Soil Color Chart Juniper Green or equivalent within six months of installation.

**COMPLIANCE/MONITORING:** On-going compliance inspections and monitoring of drilling, production, and post-production activities will be conducted by White River Field Office staff during construction of well pads, access roads, and pipelines. Specific mitigation developed in this Environmental Assessment and the lease terms and conditions will be followed. The Operator will be notified of compliance related issues in writing, and depending on the nature of the issue(s), will be provided 30 days to resolve such issues.

**NAME OF PREPARER:** Chad Baker (SWCA)/Brett Smithers (Natural Resource Specialist)

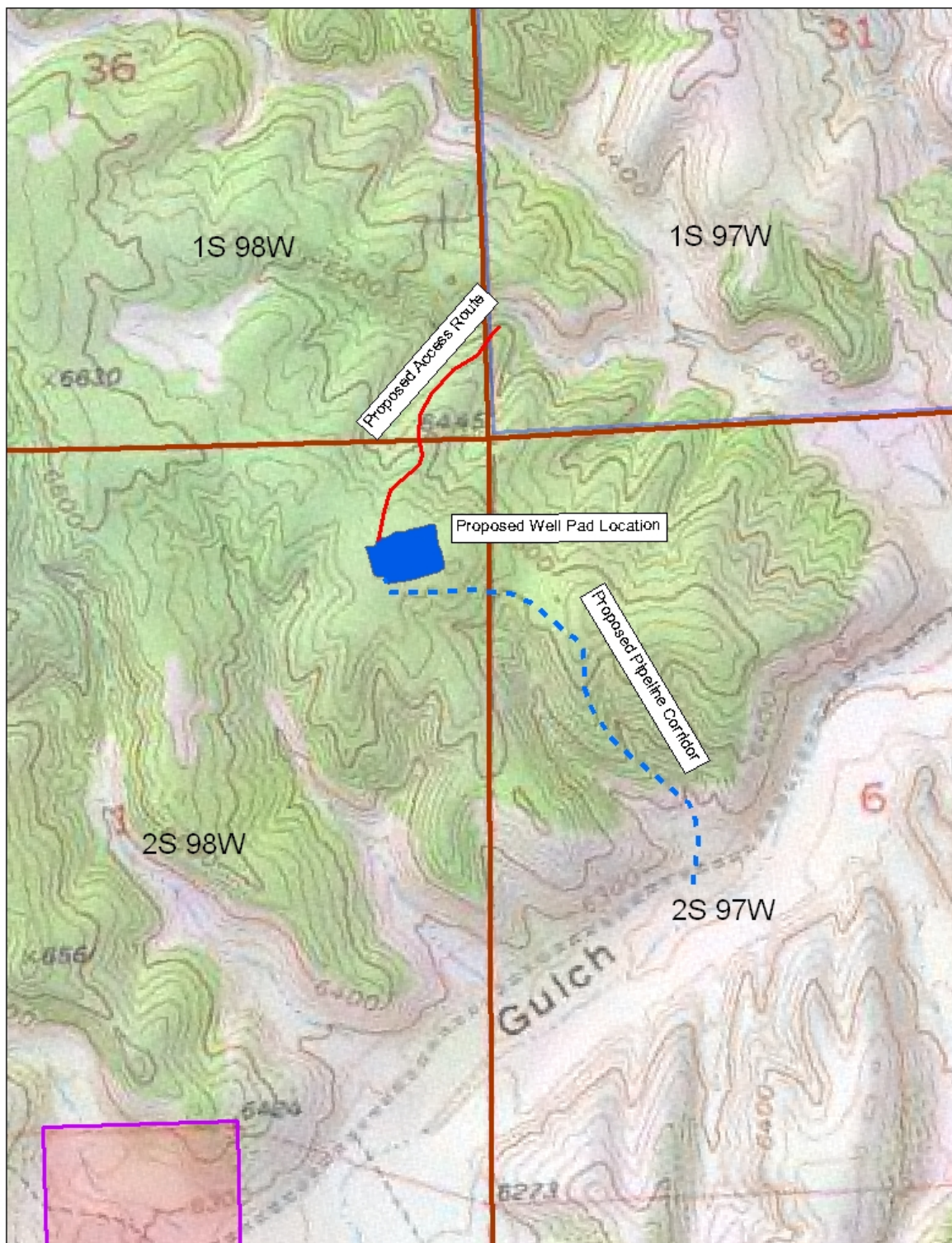
**NAME OF ENVIRONMENTAL COORDINATOR:** Caroline Hollowed

**SIGNATURE OF AUTHORIZED OFFICIAL:**   
Field Manager

**DATE SIGNED:** 06/16/09

**ATTACHMENTS:**

Figure 1 Project Location Map of Proposed Action



**Figure 1.** Project area map for the proposed action which includes the construction of an access road, well pad and pipeline corridor.