

U.S. Department of the Interior
 Bureau of Land Management
 Colorado River Valley Field Office
 2300 River Frontage Road
 Silt, Colorado 81652

ENVIRONMENTAL ASSESSMENT

NUMBER: DOI-BLM-CO-N040-2010-0055-EA

CASEFILE NUMBER: Federal Lease COC66576.

PROJECT NAME: Proposal to Construct an Access Road, Install Buried Gas and Water Pipelines, and Drill Seven Federal Wells on the Proposed Miller #10 Well Pad, Garfield County, Colorado.

LOCATION: SWSE, Section 31, Township 6 South (T6S), Range 91 West (R91W), and Lot 2, Section 6, T7S, R91W, Sixth Principal Meridian (Figure 1).

LEGAL DESCRIPTIONS: Surface and bottomhole locations of the proposed Federal wells addressed in this Environmental Assessment (EA) are listed in Table 1.

Table 1. Surface and Bottomhole Locations of Proposed Federal Wells		
<i>Proposed Wells</i>	<i>Surface Locations</i>	<i>Bottomhole Locations</i>
	<i>SWSE, Section 31, T6S, R91W</i>	<i>SESW, Section 31, T6S, R91W</i>
Miller Federal 24D-31-691	2 feet FNL, 2437 feet FEL	1140 feet FSL, 1998 feet FWL
	<i>Lot 2, Section 6, T7S, R91W</i>	<i>Lot 2, Section 6, T7S, R91W</i>
Miller Federal 23B-6-791	44 feet FNL, 2412 feet FEL	955 feet FNL, 2025 feet FWL
Miller Federal 23C-6-791	32 feet FNL, 2423 feet FEL	575 feet FNL, 2015 feet FWL
Miller Federal 23D-6-791	26 feet FNL, 2415 feet FEL	195 feet FNL, 2015 feet FWL
	<i>Lot 2, Section 6, T7S, R91W</i>	<i>SESW, Section 31, T6S, R91W</i>
Miller Federal 24A-31-691	20 feet FNL, 2433 feet FEL	165 feet FSL, 1998 feet FWL
Miller Federal 24B-31-691	8 feet FNL, 2444 feet FEL	490 feet FSL, 1998 feet FWL
Miller Federal 24C-31-691	14 feet FNL, 2426 feet FEL	815 feet FSL, 1998 feet FWL

APPLICANT: Bill Barrett Corporation. Contact: Tracey Fallang, 1099 Eighteenth Street, Suite 2300, Denver, Colorado 80202.

PROPOSED ACTION

Bill Barrett Corporation (“BBC”) proposes construct a new well pad and access road in order to drill and develop 11 oil and gas wells. The Miller #10 well pad, on private surface, is located southeast of Silt, Garfield County, Colorado. Seven Federal wells would be drilled directionally into Federal lease COC66576, and four Fee (private) wells would be drilled into private mineral estate underlying the private surface (Figure 1). The site is accessed by driving southeast from Silt on Divide Creek Road (County Road 311) 5 miles, then east on a dirt road that accesses Gibson Gulch for 0.5 mile, then through the gate at an existing BBC well pad and along an existing dirt road for approximately 0.3 mile.

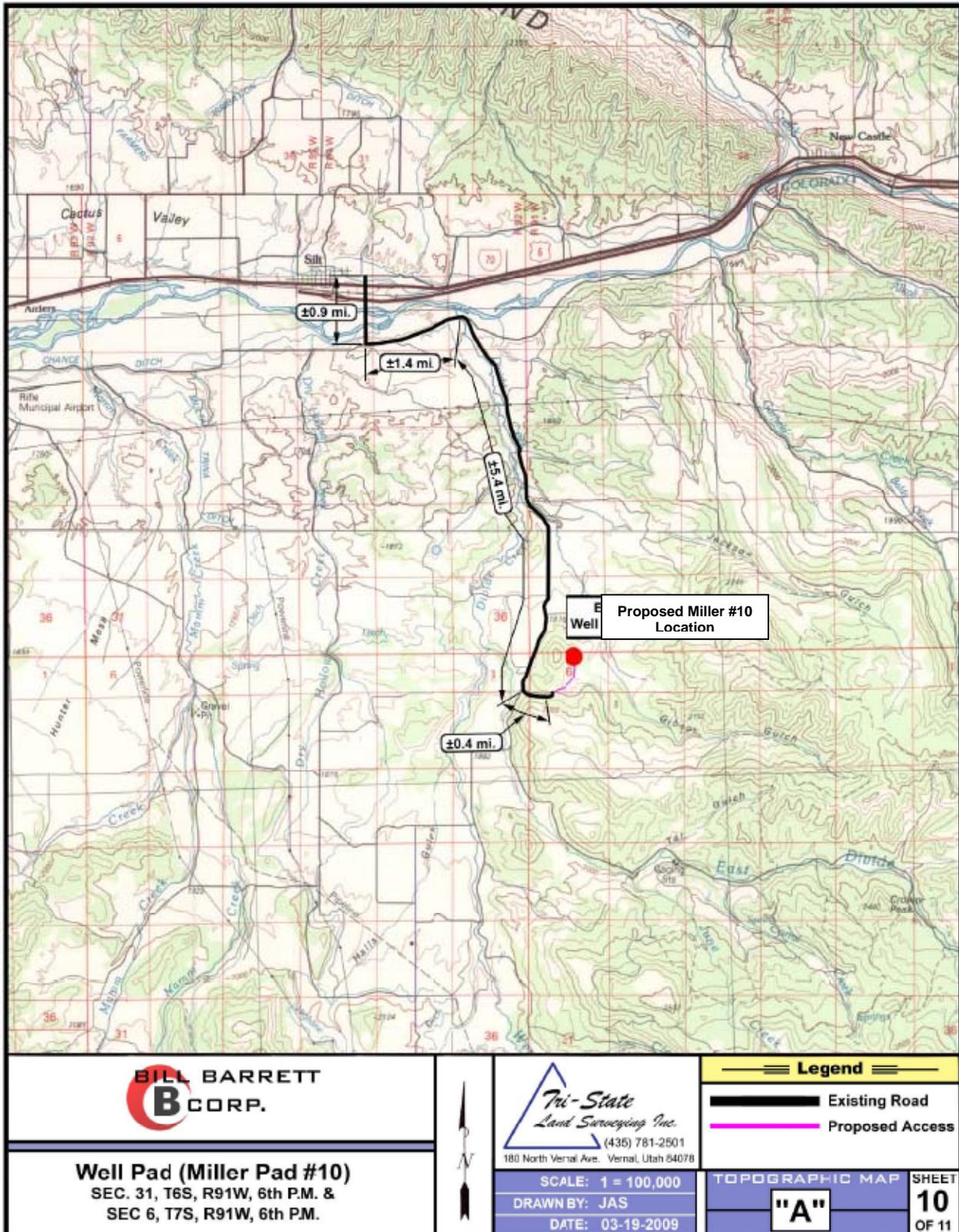


Figure 1. Project Location

Implementation of the project would include construction of up to 144 feet of new access road and collocated pipelines to convey natural gas and produced water. New roads and pipelines would be built within a 50-foot-wide permanent right-of-way (ROW), 20 feet of which may be used for a temporary use area for road and pipeline construction, and would be reclaimed after construction is complete. Permanent surface facilities needed to support oil and gas development would include wellheads and separation units. Aboveground tanks for storage of condensate and produced water would be located on the Miller #6 pad, located approximately 0.5 mile south of the proposed Miller #10 pad (Figure 2). Table 2 summarizes short-term and long-term surface disturbance resulting from the Proposed Action.

Table 2. Project-Related Surface Disturbance (acres)			
<i>Component</i>	<i>Initial Disturbance</i>	<i>Long-term Disturbance</i>	<i>Interim Reclamation Area</i>
Pad	4.4	1.2	3.2
Road and Pipeline (144 feet)	0.17	0.10	0.07
Total (road, pad, pipelines)	4.57	1.30	3.27

The pad would also have a cuttings pit for disposal of drill cuttings. Following well completion, cuttings would be removed from the pit. The pit would be allowed to dry and then be backfilled, covered, and reclaimed. Produced water transported from the wells by buried pipeline or (when necessary) by truck would go to BBC's water collection facilities located south of Silt. Natural gas pipeline compressors are not expected as part of this proposal.

Following completion activities, areas not needed during production would undergo interim reclamation to minimize pad size during production. Interim reclamation would use the methods, standards, and plant species specified by BLM. When the wells are no longer producing economic quantities of gas, the wells would be closed and abandoned, and the pad would undergo final reclamation.

NO ACTION ALTERNATIVE

The Proposed Action involves Federal subsurface minerals that are encumbered with Federal oil and gas leases, which grant the lessee a right to explore and develop the lease. Although the Bureau of Land Management (BLM) cannot deny the right to drill and develop the leasehold, individual applications for permit to drill (APDs) can be denied to prevent unnecessary and undue degradation. The No Action Alternative constitutes denial of the APDs associated with the Proposed Action. However, some elements of the Proposed Action do not require Federal approval prior to implementation. For example, 4 of the 11 proposed wells would be drilled into Fee mineral estate. Therefore, the Miller #10 location would likely be developed under the authority of the Colorado Oil and Gas Conservation Commission (COGCC) even if APDs associated with the Federal wells were denied. This would result in associated surface disturbance under the No Action alternative essentially the same as under the Proposed Action.

SUMMARY OF LEASE STIPULATIONS

Seven Federal wells would be drilled directionally from the Miller #10 location into Federal lease COC66576. However, the location is on private surface overlying private minerals. The BLM Colorado River Valley Field Office (CRVFO) does not apply lease stipulations diagonally to lands not overlying the lease. Figure 2 shows the location of the proposed well pad, the bottomhole targets, and Federal lease COC66576.

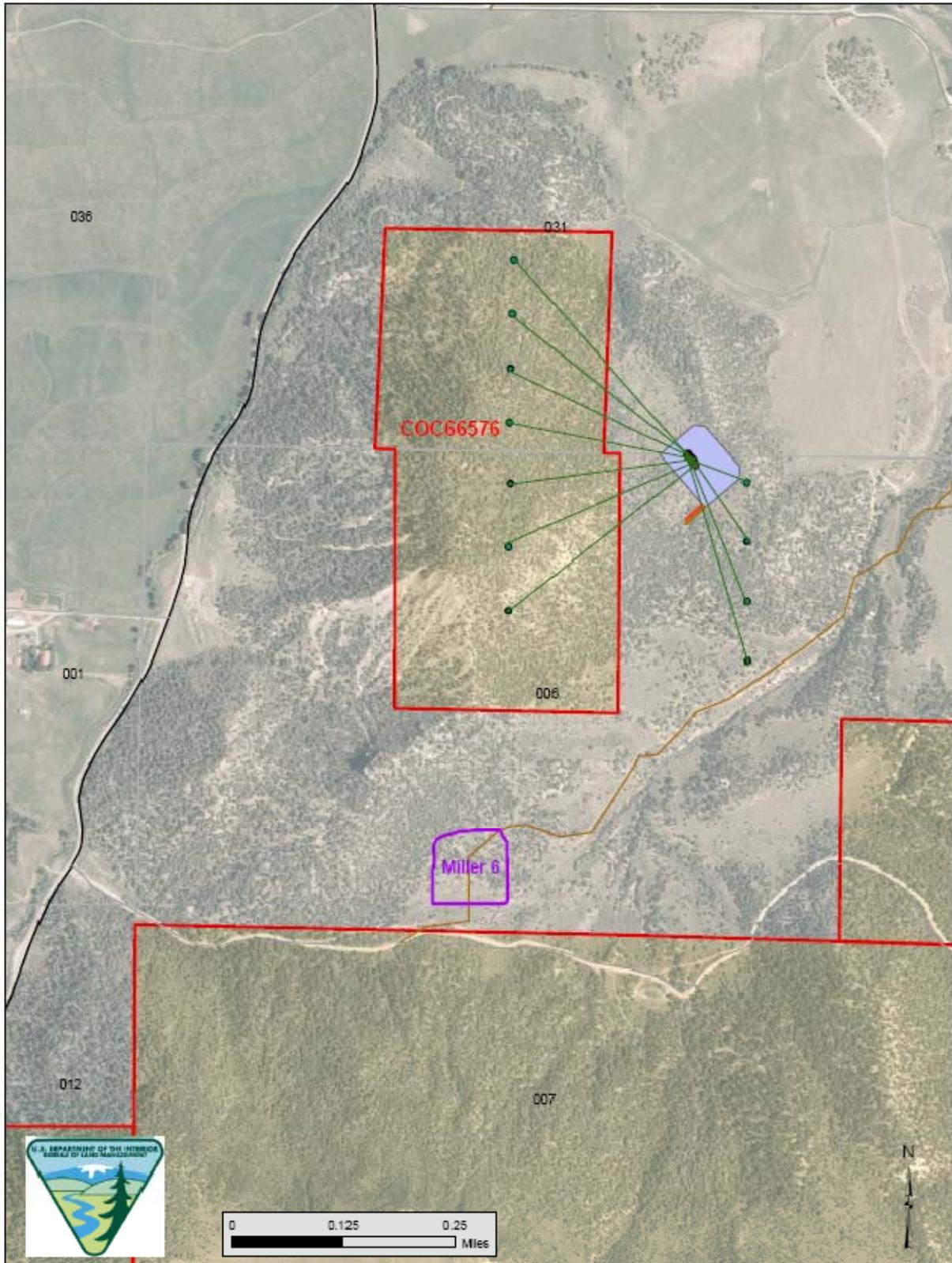


Figure 2. Proposed Miller #10 Pad Location and Downhole Targets

LAND USE PLAN CONFORMANCE REVIEW

The Proposed Action is subject to and has been reviewed for conformance with the following plan (43 CFR 1610.5, BLM 1617.3):

Name of Plan: The current land use plan is the *Glenwood Springs Resource Management Plan (RMP)*, approved in 1984 and revised in 1988 (BLM 1984). Relevant amendments include the *Oil and Gas Plan Amendment to the Glenwood Springs Resource Management Plan (BLM 1991)* and the *Oil & Gas Leasing & Development Record of Decision and Resource Management Plan Amendment (BLM 1999a)*.

Decision Language: The 1991 Oil and Gas Plan Amendment (BLM 1991) included the following at page 3: “697,720 acres of BLM-administered mineral estate within the Glenwood Springs Resource Area are open to oil and gas leasing and development, subject to lease terms and (as applicable) lease stipulations” (BLM 1991, page 3). This decision was carried forward unchanged in the 1999 ROD and RMP amendment at page 15 (BLM 1999b): “In areas being actively developed, the operator must submit a Geographic Area Proposal (GAP) [currently referred to as a Master Development Plan, MDP] that describes a minimum of 2 to 3 years of activity for operator controlled leases within a reasonable geographic area.”

Discussion: The Proposed Action is in conformance with the 1991 and 1999 RMP amendments cited above because the Federal mineral estate proposed for development is open to oil and gas leasing and development. The 1999 RMP amendment requires multi-year development plans known at that time as Geographic Area Plans (GAPs) for lease development over a large geographic area. However, the 1999 RMP amendment also provides exceptions to that requirement for individual or small groups of exploratory wells drilled in relatively undrilled areas outside known high production areas. Because this project includes only a single pad with Federal wells and would be completed in less than 2 years, preparation of a GAP/MDP is not appropriate.

STANDARDS FOR PUBLIC LAND HEALTH

In January 1997, Colorado BLM approved the Standards for Public Land Health. The five 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. The environmental analysis must address whether a Proposed Action or alternatives being analyzed would result in impacts that would maintain, improve, or deteriorate land health conditions relative to these resources. However, because the surface disturbance would be entirely on Fee surface, the Standards for Public Land Health do not apply.

AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This section provides a description of the human and natural environmental resources that could be affected by the Proposed Action and No Action alternative. In addition, the section presents comparative analyses of the direct and indirect consequences on the affected environment stemming from the implementation of the various actions.

A variety of laws, regulations, and policy directives mandate the evaluation of the effects of a Proposed Action and alternative(s) on certain critical environmental elements. Not all of the critical elements that require inclusion in this EA are present, or if they are present, would be affected by the Proposed Action or No Action alternative (Table 2). Only mandatory critical elements that are present and affected are described in the following narrative.

Table 2. Critical Elements of the Human Environment									
<i>Critical Element</i>	<i>Present</i>		<i>Affected</i>		<i>Critical Element</i>	<i>Present</i>		<i>Affected</i>	
	Yes	No	Yes	No		Yes	No	Yes	No
Air Quality	X		X		Prime or Unique Farmlands		X		X
Areas of Critical Environmental Concern		X		X	Special Status Species	X		X	
Cultural Resources		X		X	Wastes, Hazardous or Solid	X		X	
Environmental Justice		X		X	Water Quality, Surface and Ground	X		X	
Floodplains		X		X	Wetlands and Riparian Zones		X		X
Invasive Non-native Species	X		X		Wild and Scenic Rivers		X		X
Migratory Birds	X		X		Wilderness and Wilderness Study Areas		X		X
Native American Religious Concerns		X		X					

In addition to the mandatory critical elements, other resources would be affected by the Proposed Action and No Action Alternative. These are discussed under **Other Affected Resources**.

CRITICAL ELEMENTS

Air Quality

Affected Environment

The project area is located in a semi-arid (dry and cold), mid-continental climate regime. The area is typical of the western high country with abundant sunshine, low humidity, low rainfall, and cold, snowy winters. The nearest meteorological measurements were collected at Rifle, Colorado (1910-2008) (WRCC 2009), approximately 10 miles northwest of the project area.

The annual average total precipitation at Rifle is 11.48 inches and includes an average total snowfall of 39.9 inches, with December and January being the snowiest months. Precipitation is relatively evenly distributed throughout the year. The Rifle area has cool temperatures, with average daily temperatures ranging between 9.4°F (low) and 36.8°F (high) in mid-winter and between 52.0°F (low) and 90.2°F (high) in mid-summer. The frost-free period (above 32°F) generally occurs from mid-May to mid-September. The annual mean wind speed is approximately 3.7 mph. The frequency and strength of the winds greatly affect the dispersion and transport of air pollutants. The potential for atmospheric dispersion is generally good, although nighttime cooling enhances stable air, inhibiting air pollutant mixing and transport. Dispersion conditions are the greatest on ridges, plateaus, and mountaintops.

The Colorado Ambient Air Quality Standards (CAAQS) and National Ambient Air Quality Standards (NAAQS) are health-based criteria for the maximum acceptable concentrations of air pollutants at all locations to which the public has access. Although specific air quality monitoring has not been conducted in the field, regional air quality monitoring has been conducted near the study area. Air pollutants

measured in the region for which ambient air quality standards exist include: carbon monoxide (CO), nitrogen dioxide (NO₂), ozone (O₃), particulate matter less than 10 microns (μ) in effective diameter (PM₁₀), particulate matter less than 2.5μ in effective diameter (PM_{2.5}), and sulfur dioxide (SO₂). Background pollutant concentrations for these pollutants are compared to the CAAQS and NAAQS in Table 3. As shown in Table 3, regional background values are well below established standards. The region is within attainment levels for all criteria pollutants.

Table 3. Air Pollutant Background Concentrations, Colorado and National Ambient Air Quality Standards, and Prevention of Significant Deterioration (PSD Increments)					
Pollutant/Averaging Time		Measured Background Concentration	Colorado and/or National AAQS	Incremental Increase Above Legal Baseline PSD Class I/ II	
Carbon Monoxide (CO) ¹	1-hour	1,160 μg/m ³	40,000 μg/m ³ (35 ppm)	n/a	n/a
	8-hour	1,160 μg/m ³	10,000 μg/m ³ (9 ppm)	n/a	n/a
Nitrogen Dioxide (NO ₂) ²	Annual	10 μg/m ³	100 μg/m ³ (0.053 ppm)	2.5 μg/m ³	25 μg/m ³
Ozone ³	8-hour	0.076 ppm ³ (highest)	(0.075 ppm)	n/a	n/a
Particulate Matter (PM ₁₀) ¹	24-hour	114 μg/m ³ (highest)	150 μg/m ³	8 μg/m ³	30 μg/m ³
Particulate Matter (PM _{2.5}) ⁴	24-hour	40 μg/m ³ (highest)	35 μg/m ³	n/a	n/a
	Annual	11.2 μg/m ³	15 μg/m ³	n/a	n/a
Sulfur Dioxide (SO ₂) ⁵	3-hour	24 μg/m ³	1,300 μg/m ³ (0.5 ppm)	25 μg/m ³	512 μg/m ³
	24-hour	13 μg/m ³	365 μg/m ³ (0.14 ppm)	5 μg/m ³	91 μg/m ³
	Annual	5 μg/m ³	80 μg/m ³ (0.03 ppm)	2 μg/m ³	20 μg/m ³

¹ Background data collected in Rifle, 2008; highest levels recorded in April (Air Resource Specialists 2009).
² Background data collected by EnCana at site north of Parachute, 2007 (CDPHE 2008a).
³ Background data collected in Rifle, 2008; highest levels recorded in July (Air Resource Specialists 2009).
⁴ Background data collected in Rifle, September - December 2008; highest levels recorded in December (Air Resource Specialists 2009).
⁵ Background data collected at Unocal site, 1983-1984 (CDPHE 2008a); CAAQS 3-hour standard is 700 μg/m³.

Federal air quality regulations adopted and enforced by Colorado Department of Public Health and Environment (CDPHE) limit incremental emissions increases to specific levels defined by the classification of air quality in an area. The Prevention of Significant Deterioration (PSD) Program is designed to limit the incremental increase of specific air pollutant concentrations above a legally defined baseline level. Incremental increases in PSD Class I areas are strictly limited, while increases allowed in Class II areas are less strict.

The project area is classified as PSD Class II. The PSD Class I areas located within 100 miles of the project area are Flat Tops Wilderness (approximately 25 miles north), Maroon Bells – Snowmass Wilderness (approximately 35 miles south), West Elk Wilderness (approximately 60 miles southeast), Black Canyon of the Gunnison National Monument (approximately 65 miles south), and Eagles Nest Wilderness (approximately 60 miles east). Dinosaur National Monument (approximately 80 miles northwest) is listed as a Federal Class II area but is regulated as a Class I area for SO₂ by CDPHE. These sensitive areas have potential to be impacted by cumulative project source emissions. Regional background pollutant concentrations and NAAQS, CAAQS, and PSD Class I and II increments are also presented in Table 3.

CDPHE, under its Environmental Protection Agency (EPA)-approved State Implementation Plan (SIP), is the primary air quality regulatory agency responsible for determining potential impacts once detailed

industrial development plans have been made. Those development plans are subject to applicable air quality laws, regulations, standards, control measures, and management practices.

Environmental Consequences

Proposed Action

The proposed project includes constructing, drilling, completing, and operating up to 11 wells, including seven Federal wells and four Fee wells; constructing or upgrading 144 feet of collocated access roads and pipelines; and installing four 625-barrel (bbl) tanks for condensate, four 625-bbl tanks for produced water, and three separator units. The project would not include construction of any compressor stations or installation of any generators or dehydration units.

Localized air quality impacts would occur during construction of the Miller #10 pad. Pollutants resulting from construction activities include combustion emissions and fugitive dust associated with operation of earth-moving equipment and vehicles. Once construction activities are complete, air quality impacts associated with these activities would decrease markedly but not be eliminated due to ongoing equipment and vehicle operations. Construction activities would occur between 7:00 a.m. and 6:00 p.m. each day for a period of approximately 2 weeks. Construction of the pad would take approximately 6 to 8 weeks, construction of the road to the pad would take 1 to 2 weeks, and laying of pipelines would take approximately 2 weeks; much of this construction would occur concurrently. To mitigate dust generated during construction, drilling and completion, and production phases of the project, BBC would be required to implement dust abatement strategies as needed by watering the access roads and construction areas and/or by applying a surfactant approved by the BLM (Appendix A). Additionally, the operator would be required to apply gravel to the access road to a compacted depth of 6 inches, further reducing fugitive dust emissions (Appendix A).

During long-term production of wells on the Miller #10 pad, low levels of volatile organic compounds (VOCs) would be emitted from condensate tanks; the amount of emissions is dependent on the characteristics of the condensate, tank operations, and production. Although minor, emissions of VOCs from condensate tanks would be further reduced under CDPHE Regulation 7, pursuant to which the COGCC requires that VOCs from the tanks be collected and thermally destroyed onsite.

The Roan Plateau RMPA/EIS describes potential effects from oil and gas development (BLM 2006a:4-26 to 4-37). Analysis was completed with regard to greenhouse gas emissions, a near-field and far-field analysis for carbon monoxide, particulate matter (PM₁₀ and PM_{2.5}), sulfur dioxide, hazardous air pollutants including: benzene, ethylbenzene, formaldehyde, hydrogen sulfide, toluene, and xylenes. Sulfur and nitrogen deposition analysis, acid neutralizing capacity, and visibility screening-level analysis were also completed in the Roan Plateau RMPA/EIS. Findings indicate that no adverse long-term effects would result under that plan. Since the Proposed Action is within the scope of the level of oil and gas development on which the Roan Plateau RMPA/EIS air modeling was based, it is anticipated that the Proposed Action would not have significant adverse impacts on air quality.

Since the current land use plan was approved, ongoing scientific research has identified the potential impacts of “greenhouse gases” (GHGs) and their effects on global atmospheric conditions. These GHGs include carbon dioxide, methane, nitrous oxide, water vapor, and several trace gases. Through complex interactions on a global scale, these GHG emissions are believed by many experts to cause a net warming effect of the atmosphere, primarily by decreasing the amount of heat energy radiated by the Earth back into space.

In 2001, the Intergovernmental Panel on Climate Change (IPCC) predicted that by the year 2100, global average surface temperatures would increase 1.4 to 5.8°C (2.5 to 10.4°F) above 1990 levels. The National Academy of Sciences (2007) supports these predictions but has acknowledged that there are uncertainties regarding how climate change may affect different regions. In 2007, the IPCC also concluded that “warming of the climate system is unequivocal” and “most of the observed increase in globally average temperatures since the mid-20th century is very likely due to the observed increase in anthropogenic (man-made) greenhouse gas concentrations” (National Academy of Sciences 2007). Other theories about the effect of GHGs on global climate change exist.

The assessment of GHG emissions and climate change remains in its formative phase. Therefore, it is not yet possible to know with certainty the net impact to climate from GHGs produced globally over the last century or from those produced today. The lack of scientific tools designed to predict climate change on regional or local scales limits the ability to quantify potential future impacts of climate change on the specific area of the Proposed Action. In addition, while any oil and gas leasing or development projects may contribute GHGs to the atmosphere, these contributions would not have a significant effect on a phenomenon occurring at the global scale believed by some to be due to more than a century of human activities.

No Action Alternative

Under the No Action alternative, the four Fee wells could be developed on the Miller #10 pad under the authority of the COGCC. Therefore, construction-related impacts on air quality would be the same as under the Proposed Action, while impacts associated with long-term emissions from production facilities or routine traffic on the access road would be reduced proportionately.

Cultural Resources

Affected Environment

A Class III cultural resource inventory (GSFO# 1110-7) was conducted for the well pad, access road, and collocated pipeline. No historic properties were identified that are eligible for listing on the National Register of Historic Places (NRHP).

Environmental Consequences

Proposed Action

No direct effects to cultural resources from construction of the well pad, access road, or collocated pipeline are anticipated. Although the potential for indirect impacts would likely increase somewhat due to easier access into an area that was previously more difficult to access., a determination of **No Historic Properties Affected** was made in accordance with the National Historic Preservation Act (16 U.S.C. 470f), the National BLM/SHPO (State Historic Preservation Office) Programmatic Agreement (1997), and Colorado Protocol (1998). The Inadvertent Discovery stipulation needs to be added and all personnel need to be informed about reporting and protecting cultural resources.

No Action Alternative

Under this alternative, the private wells would probably be drilled from the same or similar pad location, involving the same or similar access road and pipeline. Therefore, direct and indirect impacts would be the same as under the Proposed Action.

Invasive Non-native Species

Affected Environment

Two non-native annual grasses—cheatgrass (*Anisantha tectorum*), a List C noxious weed, and bulbous bluegrass (*Poa bulbosa*), an invasive species—are common throughout the project area. Other non-native species in the project area include tumble mustard (*Sisymbrium altissimum*) and prickly lettuce (*Lactuca serriola*).

Environmental Consequences

Proposed Action

Surface-disturbing activities provide a niche for the invasion and establishment of invasive non-native species, particularly when these species are already present in the surrounding area. Because numerous invasive, non-native species are present in the project area, the potential for invasion following construction activities is high. Mitigation measures designed to minimize the spread of these species would be attached to well APDs as conditions of approval (see Appendix A).

No Action Alternative

Under the No Action alternative, the Fee well pad, road, and pipeline would be constructed to support drilling of the Fee wells. Therefore, impacts to surface resources would be similar to those under the Proposed Action. Invasive, non-native species would be expected to spread if left untreated.

Migratory Birds

Affected Environment

The project area is located with pinyon-juniper woodland and sagebrush grassland habitats, which provide cover, food, and nesting sites for a variety of migratory birds. Species on the U. S. Fish and Wildlife Service (USFWS) list of Birds of Conservation Concern (BCC) that may be present in pinyon-juniper woodlands in the area include the pinyon jay (*Gymnorhinus cyanocephalus*) and juniper titmouse (*Baeolophus griseus*). Other species associated with this habitat type include Neotropical migrants such as the broad-tailed hummingbird (*Selasphorus platycercus*), western kingbird (*Tyrannus verticalis*), Say's phoebe (*Sayornis saya*), gray flycatcher (*Empidonax oberholseri*), mountain bluebird (*Sialia sialis*), plumbeous vireo (*Vireo plumbeus*), black-throated gray warbler (*Dendroica nigrescens*), chipping sparrow (*Spizella passerina*), lark sparrow (*Chondestes grammacus*), and lesser goldfinch (*Carduelis psaltria*). Sagebrush habitats may support one BCC species, Brewer's sparrow (*Spizella breweri*), as well as other migrants such as the western meadowlark (*Sturnella neglecta*) and vesper sparrow (*Pooecetes gramineus*). Based on the extent and quality of the sagebrush, the habitat is marginal for Brewer's sparrow and for another migratory sagebrush obligate, the sage sparrow (*Amphispiza bellii*).

A raptor species on the BCC list and known to exist in the area is the golden eagle (*Aquila chrysaetos*). Another BCC species, the flammulated owl (*Otus flammeolus*), is less likely to occur but potentially present in pinyon-juniper. Migratory raptors not on the BCC list but present in the area include the turkey vulture (*Cathartes aura*), American kestrel (*Falco sparverius*), and Swainson's hawk (*Buteo swainsoni*).

Resident or short-distance migrants not on the BCC list but present in the area are discussed in the section on Wildlife, Terrestrial.

Environmental Consequences

Proposed Action

The bird species discussed above—and most native bird species in the U.S.—are protected by the Migratory Bird Treaty Act (MBTA). The MBTA prohibits the “take” of a protected species. The term “take” means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. The USFWS interprets “harm” and “kill” to include loss of eggs or nestlings due to abandonment or reduced attentiveness by one or both adults as a result of disturbance by human activity, as well as physical destruction of an occupied nest.

The Proposed Action would result in the removal of approximately 4.57 acres of vegetation due to pad, road, and pipeline construction. Some of the vegetation loss would be short-term until interim reclamation is completed. Total long-term vegetation loss is estimated at 1.3 acres. Removal of pinyon and juniper trees and replacement by grasses and forbs would represent a long-term decrease in the amount of cover, food, and nesting sites for most of the associated bird species. Although grasses may be suitable for use by some species, the small reclamation areas and proximity to oil and gas operations make it unlikely that the interim reclaimed areas would receive substantial use.

The Proposed Action would further fragment habitat and reduce habitat patch size and connectivity in the area. Fragmentation could alter species composition and abundance. Species that require interior habitat could be displaced, while more common species that prefer openings or forest edges could benefit. In fragmented habitats, nest predation occurs more frequently near forest edges (Dobkin 1994). In addition, common avian and mammalian nest predators (e.g. magpies, grackles, raccoons, and skunks) typically occur in higher densities around forest edges (Bider 1968). Fragmentation can also increase the risk of nest parasitism by brown-headed cowbirds (*Molothrus alter*), causing declines in local bird populations, including BCC species. These impacts, in conjunction with existing fragmentation and disturbance within the adjacent project area, would reduce somewhat the value of the largely unfragmented interior habitat available to migratory birds.

Operation of heavy equipment would be likely to displace birds away from preferred habitats for a short time due to noise and human presence. Displaced individuals may fail to nest due to a lack of suitable habitat that is not already occupied and may also be subject to reduced survival if the areas into which they are displaced provide less food and cover. Research indicates that noise associated with development and production activities can also lead to lower avian diversity and density in both adjacent and distant areas (Forman 2000, Forman and Deblinger 2000). Noise can decrease usable habitat for birds by reducing the distance at which calls made by males are heard, affecting territory establishment and mate selection.

Vegetation clearing conducted during the spring nesting season could result in the destruction of nests and/or eggs. An indirect take (e.g., failure due to abandonment of one or both adults) of nearby nests can also occur as a result of disturbance, although reactions vary among species. Some birds that are flushed from an area may appear relatively undisturbed, but their absence from the nest for a protracted period leaves eggs and nestlings vulnerable to overheating, chilling, predation, or (for the young) starvation. A timing limitation (TL) included as a COA for the project (Appendix) prohibits initiation of vegetation removal or other surface-disturbing activities during the period May 1 to July 1. BLM may grant an exception if a survey by a qualified biologist during the nesting season indicates no active nest of a BCC species within 10 meters of the area to be disturbed. The presence of a territorial (singing) male within this distance is deemed to demonstrate the presence of a nest. Activities initiated prior to May 1 may continue into and through the TL period cited above.

Another COA in Appendix A provides protections to migratory birds from exposure to pit fluids. Additionally, the COGCC requires that combustion stacks be fitted with a screen or other method to prevent entry and mortality of birds.

No Action Alternative

Under the No Action alternative, the well pad, road, and pipeline are likely to be constructed to support the Fee wells. In general, impacts to migratory birds under the No Action alternative would be similar to those under the Proposed Action with regard to habitat loss and fragmentation but less in terms of disturbance from drilling, completion, and long-term production activities.

Native American Religious Concerns

Affected Environment

The Ute tribes claim this area as part of their ancestral homeland. At present, no areas of Native American religious concern have been identified within the project area. In addition, the cultural resource survey conducted for the project did not identify any areas of concern. The Ute Tribes have indicated that they do not want to be notified or consulted if the project is small or does not include areas of Native American religious concern.

Environmental Consequences

Proposed Action

Although no direct impacts would result from the Proposed Action, indirect impacts from increased access and personnel in the vicinity of the proposed project could result in impacts to undiscovered Native American resources. These impacts could range from illegal collection to vandalism.

No Action Alternative

Under the No Action alternative, the well pad, road, and pipeline could be constructed under the authority of the COGCC to support the four Fee wells. Therefore, impacts under the No Action alternative would be similar to the Proposed Action.

Special-Status Species

Federally Listed, Proposed, or Candidate Plant Species

Affected Environment

According to the current species list available online from the USFWS (<http://www.fws.gov/mountain-prairie/endspp/CountyLists/Colorado.pdf>), the following Federally listed, proposed, or candidate threatened or endangered plant species may occur within or be impacted by actions occurring in Garfield County: Colorado hookless cactus (*Sclerocactus glaucus*), DeBeque phacelia (*Phacelia submutica*), Parachute beardtongue (*Penstemon debilis*), and Ute ladies'-tresses orchid (*Spiranthes diluvialis*).

Environmental Consequences

Proposed Action

The results of a plant survey for the project in May 2010 indicated no habitat for Federally listed, proposed, or candidate plant species in the project area. Therefore, the project would have “**No Effect**” on these species.

No Action Alternative

Because the well pad, access road, and collocated pipeline would be built to support the four Fee wells, the potential for impacts to Federally listed, proposed, or candidate plant species would be the same as under the Proposed Action.

Federally Listed, Proposed, or Candidate Animal Species

Affected Environment

According to the latest species list from the USFWS (http://www.fws.gov/mountainprairie/end_spp/CountyLists/Colorado.pdf), the following Federally listed, proposed, or candidate threatened or endangered animal species may occur within or be impacted by actions occurring in Garfield County: Canada lynx (*Lynx canadensis*), Mexican spotted owl (*Strix occidentalis*), yellow-billed cuckoo (*Coccyzus americanus*), razorback sucker (*Xyrauchen texanus*), Colorado pikeminnow (*Ptychocheilus lucius*), humpback chub (*Gila cypha*), bonytail (chub) (*Gila elegans*), and greenback cutthroat trout (*Oncorhynchus clarki stomias*).

Endangered Colorado River Fishes. Four species of Federally listed big-river fishes occur within the Colorado River drainage basin near or downstream from the project area. These endangered species are the razorback sucker, Colorado pikeminnow, humpback chub, and bonytail. Designated Critical Habitat for the razorback sucker and Colorado pikeminnow includes the Colorado River and its 100-year floodplain west (downstream) from the town of Rifle. The project area is within the Colorado River watershed upstream from Rifle. The nearest known habitat for the humpback chub and bonytail is within the Colorado River approximately 70 miles downstream from the project area. Only one population of humpback chub, at Black Rocks west of Grand Junction, is known to exist in Colorado.

The greenback cutthroat trout is a subspecies of cutthroat trout native to the eastern slope of Colorado (Platte River drainage). Its documented presence in some streams of Garfield County suggest that either fish were intentionally removed from east-slope waters and stocked in west-slope waters, or that the genetics of this species and the Colorado River cutthroat trout (the subspecies native to the western slope) are not clearly defined. The greenback cutthroat trout is not known or expected to occur within or near the project area.

Terrestrial Vertebrates. None of the Federally listed, proposed, or candidate terrestrial wildlife species that occurs or is potentially present in Garfield County—the Mexican spotted owl, yellow-billed cuckoo, and Canada lynx—is considered very unlikely to occur in the project area or vicinity due to lack of habitat and/or negative results of prior surveys. Hence, these species are not considered further in this document. The bald eagle (*Haliaeetus leucocephalus*) and peregrine falcon (*Falco peregrinus*), which were removed from the listed of threatened or endangered species in August 2007 and August 1999, respectively, are now classified by BLM as sensitive species (see below). Although no longer protected by the Endangered Species Act, both species remain protected by the Migratory Bird Treaty Act; the bald eagle is also protected by the Bald and Golden Eagle Protection Act.

Environmental Consequences

Proposed Action

Endangered Colorado River Fishes. Construction activities would increase the potential for soil erosion and sedimentation. Although a minor temporary increase in sediment transport to the Colorado River may occur, it is unlikely that the increase would be detectable above current background levels. In any case, the Federally listed, proposed, or candidate fish species associated the Colorado River are adapted to naturally high sediment loads and would not be affected by the amount of sediment inflow potentially resulting from the project.

Surface runoff of pollutants from the project area also has the potential to affect Colorado River fishes. Any leaks from trucks, drilling equipment, tanks, or ancillary facilities would be likely to reach the river during runoff events. However, the volumes of potential spills, the toxicity to aquatic organisms of the anticipated constituents, the distance to the Colorado River, and the dilution in the runoff and the Colorado River, are unlikely to result in adverse impacts to these fishes.

Additional potential impacts to the endangered Colorado River fishes would be associated with depletions in flows due to use of water from the Colorado River Basin in drilling, hydrostatic testing of pipelines, and dust abatement of unpaved access roads. Reductions in flows in the Colorado River and major tributaries have resulted from evaporative loss from reservoirs, withdrawals for irrigation, and other consumptive uses. These depletions have affected minimum flows, as well as peak “flushing” flows needed to maintain suitable substrates for spawning.

In May 2008, BLM prepared a Programmatic Biological Assessment (PBA) addressing water-depleting activities associated with BLM’s fluid minerals program in the Colorado River Basin in Colorado. In response to BLM’s PBA, the USFWS issued a Programmatic Biological Opinion (PBO) (ES/GJ-6-CO-08-F-0006) on December 19, 2008, concurring with BLM’s effects determination of “**May Affect, Likely to Adversely Affect**” for the razorback sucker Colorado pikeminnow, humpback chub, and bonytail as a result of depletions associated with oil and gas projects. To offset the impacts, the BLM has set up a Recovery Agreement, which includes a one-time fee per well to use for site-specific mitigation projects. These funds are used to contribute to the recovery of endangered fish through the restoration of habitat, propagation, and genetics management, instream flow identification and protection, program management, non-native fish management, research and monitoring, and public education.

No Action Alternative

Under the No Action alternative, the well pad, road, and pipeline could be constructed under the authority of the COGCC to support the four Fee wells. Therefore, impacts to Federally listed, proposed, or candidate animal species under the No Action alternative would similar with regard to surface disturbance (i.e., sediment transport) but proportionately less with regard to well-related impacts (pollutants and depletions of streamflows).

BLM Sensitive Plant Species

Affected Environment

BLM sensitive plant species with habitat and/or occurrence records in the area include DeBeque milkvetch (*Astragalus debequaeus*), Naturita milkvetch (*Astragalus naturitensis*), Roan Cliffs blazing star (*Mentzelia rhizomata*), Piceance bladderpod (*Lesquerella parviflora*), and Harrington’s penstemon (*Penstemon harringtonii*).

Environmental Consequences

Proposed Action

Results of a May 2010 plant inventory indicate no BLM sensitive plant species or their habitats in the vicinity of the Proposed Action.

No Action Alternative

Since no BLM sensitive plant species occur in the project area, no impacts to these species are anticipated.

BLM Sensitive Animal Species

Affected Environment

BLM sensitive animal species with habitat and/or occurrence records in the portion of the CRVFO that includes the project area and vicinity are listed in Table 5.

Table 5. Special Status Wildlife Species Present or Potentially Present in the Project Area		
<i>Common Name</i>	<i>Habitat</i>	<i>Potential for Occurrence</i>
Fringed myotis	Breeds and roosts in caves, trees, mines, and buildings; hunts over pinyon-juniper, montane conifer, and semi-desert shrubland habitats.	Possible
Townsend's big-eared bat	Breeds and roosts in caves, trees, mines, and buildings; hunts over pinyon-juniper, montane conifer, and semi-desert shrubland habitats.	Possible
Northern goshawk	Predominantly uses spruce/fir forests but will also use Douglas-fir, various pines, and aspens.	Likely winter visitor
Bald eagle	Nests and roosts in mature cottonwood forests along rivers, large streams, and lakes.	Present along Colorado River
Brewer's sparrow	Sagebrush shrublands, mountain parks; may be found in alpine willow stands.	Possible
Northern leopard frog	Wet meadows and the shallows of marshes, ponds, glacial kettles, beaver ponds, lakes, reservoirs, streams, and irrigation ditches.	Possible, Not Found during Surveys
Midget faded rattlesnake	High, cold desert dominated by sagebrush and with an abundance of rock outcrops and exposed canyon walls.	Possible
Flannelmouth sucker	Generally restricted to rivers and major tributaries.	Present in Colorado River
Bluehead sucker	Generally restricted to rivers and major tributaries.	Present in Colorado River
Roundtail chub	Generally restricted to rivers and major tributaries.	Present in Colorado River
Colorado River Cutthroat Trout	Occur mostly in headwater streams and lakes of the Colorado River drainage.	Present in Divide Creek

Environmental Consequences

Proposed Action

Fringed Myotis (*Myotis thysanodes*) and Townsend's Big-eared Bat (*Corynorhinus townsendii*). These species hunt at night for aerial insects over pinyon-juniper woodlands, montane conifer woodlands, and semi-desert shrublands. These bats sometimes roost in tree cavities, and the pinyon-juniper habitat could receive some use for roosting. Loss of suitably large trees for roosting would be negligible, as would loss of potential feeding habitats. Neither species would be significantly affected by the project.

Northern Goshawk (*Accipiter gentilis*) and Flammulated Owl (*Otus flammeolus*). Habitat types in the project area are marginal for both species. Flammulated owls hunt in foothills and montane woodlands for nocturnal insect and small-mammal prey and nest primarily in cavities in trees. The pinyon-juniper habitat of the project has limited potential for nesting, based on the sizes of the trees, but could attract some hunting use for flammulated owls nesting in larger trees in the general vicinity. Northern goshawks occur primarily in montane and subalpine conifer/aspen forests, where they nest and hunt for diurnal prey such as birds and squirrels or chipmunks. During winter, goshawks may move to lower elevation habitats. For this reason, northern goshawks are considered likely to occur as winter visitors.

Bald Eagle. Removed from the Federal list of threatened or endangered species in August 2007, the bald eagle is now classified by BLM as a sensitive species. Bald eagles both nest and roost along the Colorado River a few miles north of the site. However, because the project area does not include the type of open habitats across which bald eagles typically hunt for prey and because of the distance from occupied or suitable habitat along the Colorado River, the Proposed Action is not expected to affect this species.

Midget Faded Rattlesnake (*Crotalus viridis concolor*). Although included in Table 5 as possibly present, this subspecies of the common and widespread western rattlesnake is very unlikely to occur. Occurrences of the midget faded rattlesnake in the CRVFO are mostly at lower elevations and in more arid and rockier environments farther west along the I-70 corridor and mostly north of the highway. If the species is present, potential impacts from direct mortality due to operation of vehicles and heavy equipment would be most likely during the active season (March to October). However, these impacts are not expected or, if they were to occur, would not affect the overall population.

Northern Leopard Frog (*Rana pipiens*) and Great Basin Spadefoot (*Spea intermontanus*) – Northern leopard frogs occur in perennial surface waters, primarily slow-moving streams and ponds, and generally where predatory fish are not present. Divide Creek is potentially suitable for the leopard frog, but the species has not been found during aquatic surveys. Mitigation measures described for soil and surface water, and associated COAs (Appendix A), would minimize sedimentation of the Colorado River and tributary streams. Although minor temporary decreases in water quality could occur, they are expected to be transitory and undetectable above background levels. The Great Basin spadefoot is associated primarily with seasonal ponds and the floors of ephemeral drainages. As with the midget faded rattlesnake, however, occurrences in the CRVFO are mostly at lower elevations and in more arid environments farther west along the I-70 corridor. Based on the above, impacts to both of these amphibian species are expected to not occur or be negligible.

Flannelmouth Sucker (*Catostomus latipinnis*), Bluehead Sucker (*Catostomus discobolus*), and Roundtail Chub (*Gila robusta*) – Mitigation measures described for soil and surface water, and associated COAs (Appendix A), would minimize sedimentation of the Colorado River and tributary streams. Although minor temporary increases may occur, they are expected to be transitory and undetectable above background levels. For this reason, and because the flannelmouth sucker, bluehead sucker, and roundtail chub are adapted to high sediment loads, the project would not be expected to affect these species.

Colorado River Cutthroat Trout (*Oncorhynchus clarki pleuriticus*) – This subspecies of cutthroat trout, which is the native subspecies in the Colorado River drainage, occurs in middle and upper portions of Divide Creek. However, it is not known to occur in lower reaches, downstream from the confluence of ephemeral streams that collect runoff from the project site, due to warm temperatures and lower habitat quality. Even if this subspecies were to occur in lower reaches of Divide Creek, mitigation measures presented in sections of this EA regarding soils and surface water, and associated COAs (Appendix A), would minimize sedimentation of the Colorado River and tributary streams. Although minor temporary increases may occur, they are expected to be transitory and undetectable above background levels. For this reason, the Proposed Action is not expected to adversely affect this species.

No Action Alternative

Under the No Action alternative, the well pad, road, and pipeline could be constructed under the authority of the COGCC to support the four Fee wells. Therefore, impacts to BLM sensitive animal species under the No Action alternative would be similar to the Proposed Action with regard to surface disturbance but proportionately less with regard to wells and related surface facilities.

Wastes, Hazardous or Solid

Affected Environment

BLM Instruction Memoranda numbers WO-93-344 and CO-97-023 require that all National Environmental Policy Act documents list and describe any hazardous and/or extremely hazardous materials that would be produced, used, stored, transported, or disposed of as a result of a proposed project. The 1998 Oil & Gas Leasing & Development Draft Supplemental EIS, Appendix L, Hazardous Substance Management Plan, contains a comprehensive list of materials that are commonly used for oil and gas projects. It also includes a description of the common industry practices for use of these materials and disposal of the waste products. These practices are dictated by various Federal and State laws and regulations, and by the BLM standard lease terms and stipulations that would accompany any authorization resulting from this analysis. The most pertinent of the Federal laws dealing with hazardous materials contamination are as follows:

- The Oil Pollution Act (Public Law 101-380, August 18, 1990) prohibits discharge of pollutants into waters of the U.S., which by definition would include any tributary (including any dry wash) that eventually connects with the Colorado River.
- The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (Public Law 96-510 of 1980) provides for liability, compensation, cleanup, and emergency response for hazardous substances released into the environment. It also provides national, regional, and local contingency plans. Applicable emergency operations plans in place include the National Contingency Plan (40 CFR 300, required by section 105 of CERCLA, the Region VIII Regional Contingency Plan, the Colorado River Sub-Area Contingency Plan (these three are Environmental Protection Agency produced plans), the Garfield County Emergency Operations Plan (developed by the Garfield County Sheriff's Emergency Operations Office), and the BLM Grand Junction Field Office Hazardous Materials Contingency Plan.
- The Resource Conservation and Recovery Act (RCRA) (Public Law 94-580, October 21, 1976) regulates the use of hazardous substances and disposal of hazardous wastes. Note: While oil and gas lessees are exempt from RCRA, right-of-way holders are not. RCRA strictly regulates the management and disposal of hazardous wastes.

The affected environment for hazardous materials includes air, water, soil, and biological resources that may potentially be affected by an accidental release of hazardous materials during transportation to and from the project area, storage, and use in construction and operations. Sensitive areas for hazardous materials releases include areas adjacent to water bodies, above aquifers, and areas where humans or wildlife would be directly impacted.

A variety of substances, including solvents, gasoline, diesel fuel, lubricating oils, hydraulic fluid, and treatment chemicals, would be used to construct and operate the proposed wells, pipelines, and associated facilities. While it is highly unlikely, it is possible that explosives may be used for blasting rock on portions of the road or pipeline corridors. Smaller quantities of other materials such as herbicides, paints, and other chemicals would be used during project operation and maintenance. These materials would be used to control noxious weeds, facilitate revegetation on the ROW, and operate and maintain meter stations during the life of the project. Potentially harmful substances used in the construction or operation would be kept onsite in limited quantities for short periods.

Waste generated by construction activities would not be exempt from hazardous waste regulations under the oil and gas exploration and production exemption of RCRA. Exempt wastes would include those associated with well production and transmission of natural gas through the gathering lines.

With the exception of produced hydrocarbons, ethylene glycol (antifreeze), lubricants, and amine compounds, chemicals subject to reporting under Title III of the Superfund Amendments and Reauthorization Act in quantities of 10,000 pounds or more would not be used, produced, stored, transported, or disposed during the construction or operation of the facilities. None of the chemicals that would be used in construction meet the criteria for an acutely hazardous material/substance, or meet the quantities criteria per BLM Instruction Memorandum No. 93-344. In addition, no extremely hazardous substance, as defined in 40 CFR 355, in amounts above threshold planning quantities, would be produced, used, stored, transported, or disposed of during construction or operation of the facilities.

Solid waste (human waste, garbage, etc.) would be generated during construction activities and, to a limited extent, during project operations. These would be removed to a landfill or water treatment facility as needed, and all would be removed prior to interim reclamation.

Emergency response to hazardous materials or petroleum products on BLM lands are handled through the BLM Grand Junction Field Office contingency plan. BLM would have access to regional resources if justified by the nature of an incident.

Environmental Consequences

Proposed Action

Possible pollutants that could be released during the construction phase of this project would include diesel fuel, hydraulic fluid, and lubricants. These materials would be used during construction and for refueling and maintaining equipment and vehicles. Potentially harmful substances used in the construction and operation phases would be kept onsite in limited quantities and trucked to and from the site as required. No hazardous substance, as defined by 40 CFR 355 would be used, produced, stored, transported, or disposed of in amounts above threshold quantities. Waste generated by construction activities would not be exempt from hazardous waste regulations under the oil and gas exploration and production exemption of RCRA. Exempt wastes would include those associated with well production and transmission of natural gas through the gathering lines and the natural gas itself.

With the exception of produced hydrocarbons, ethylene glycol (antifreeze), lubricants, and amine compounds, chemicals subject to reporting under Title III of the Superfund Amendments and Reauthorization Act in quantities of 10,000 pounds or more would not be used, produced, stored, transported, or disposed of during construction or operation of the facilities. None of the chemicals that would be used in construction meet the criteria for an acutely hazardous material/substance, or meet the quantities criteria per BLM Instruction Memorandum No. 93-344. In addition, no extremely hazardous substance, as defined in 40 CFR 355, in amounts above threshold planning quantities would be produced, used, stored, transported, or disposed of during construction or operation of the facilities.

Solid waste (human waste, garbage, etc.) would be generated during construction activities and, to a limited extent, during project operations. These would be removed to a landfill or water treatment facility as needed, and all would be removed prior to interim reclamation.

Surface water or groundwater could be impacted under the Proposed Action. Pollutants that might be released during the operational phase of the project could include condensate, produced water (if the wells in the area produce water) and glycol (carried to the site and used as antifreeze). While uncommon, an accident could occur that could result in a release of any of these materials. A release could result in contamination of surface water or soil. Improper casing and cementing procedures could result in the contamination of groundwater resources. In the case of any release, emergency or otherwise, the responsible party would be liable for cleanup and any damages. Depending on the scope of the accident, any of the above referenced contingency plans would be activated to provide emergency response. At a minimum, the BLM Grand Junction Field Office contingency plan would apply.

These laws, regulations, standard lease stipulations, and contingency plans and emergency response resources are expected to adequately mitigate any potential hazardous or solid waste issues associated with the Proposed Action.

No Action Alternative

Under the No Action alternative, the well pad, road, and pipeline could be constructed under the authority of the COGCC to support the four Fee wells. Therefore, impacts associated with hazardous and solid wastes under the No Action alternative would be similar to the Proposed Action with regard to surface disturbance but proportionately less with regard to wells and associated surface facilities.

Water Quality, Surface and Ground

Surface Water and Waters of the U.S.

Affected Environment

Most of the project area lies within the Divide Creek drainage basin, which is tributary to the Colorado River. Divide Creek, a perennial stream, is located approximately 3,000 feet from the proposed project. Another unnamed drainage is located approximately 1,000 feet east of the proposed well pad. This drainage eventually flows into East Gulch. East Gulch is an ephemeral tributary of Divide Creek and is considered "Waters of the U.S." by the U.S. Army Corps of Engineers (USACE) in 33 CFR Part 328.

Peak runoff in project area streams is a result of spring (April through early June) snowmelt and intense summer and early autumn thunderstorms. Ephemeral drainages flow only in direct response to snowmelt and intense summer and early autumn storms (BLM 1994). During large flow events, channels are often deeply incised with steep banks that slough and develop new head cuts perpendicular to the main stem.

Sediment yield in local streams can be high due to runoff from localized thunderstorms, which could affect water quality by increasing sediment and salt yields and accelerating erosion (BLM 1994).

Water quality standards and guidance for streams are included in the CDPHE Water Quality Control Commission Regulation No. 37, which describes Classifications and Numeric Standards for the Lower Colorado River Basin (CDPHE 2007b). The State has adopted basic standards and anti-degradation rules for surface waters. These standards define water bodies with four different categories of classified uses (aquatic life, water supply, recreation, and agriculture); designate uses for each water body; and adopt numeric or narrative water quality standards to protect those classified uses. The classified uses for surface water in the project area are Aquatic Life Cold, Class 1 or 2; Aquatic Life Warm, Class 1 or 2; Recreation Class 1 (1a or 1b) or 2; Domestic Water Supply; Agriculture; and Wetland (CDPHE 2007a).

No sediment measuring stations are located on the Colorado River or its tributaries near the project area. The closest downstream station on the Colorado River is near DeBeque, Colorado. A summary of the 2 years of data collected at this station is presented in Table 6 (USGS 2007a). The closest upstream station is near Glenwood Springs, for which data are limited to only eight samples from 1959.

Table 6. Sediment Yields USGS Station 9093700 (Colorado River near DeBeque, CO)				
<i>Maximum (tons/day)</i>	<i>Minimum (tons/day)</i>	<i>Mean (tons/day)</i>	<i>Median (tons/day)</i>	<i>Period of Record</i>
41,300	8.4	1817.6	267	1974 – 1976
Source: USGS 2007a.				

Environmental Consequences

Proposed Action

Project construction could have temporary to short-term impacts on surface water quality in Divide Creek and the Colorado River if construction takes place when their ephemeral tributary streams are flowing through the area. Suspended sediment during flow events would increase until disturbed areas are stabilized by reclamation. The greatest sediment load would occur immediately below stream crossings, and suspended sediment concentration would progressively decrease downstream as the large sediment particles are deposited in the channel bed.

Near-surface soil compaction caused by construction equipment and vehicles could reduce the soil's ability to absorb water and could increase surface runoff and the potential for ponding. The magnitude and duration of potential impacts to surface runoff would depend on soil depth, susceptibility of a particular soil type to erosion, vegetation cover, slope aspect and gradient, erosive force of rainfall or surface runoff, and duration and extent of construction activities. Impacts would be greatest immediately following commencement of construction activities and would naturally decrease thereafter due to soil stabilization and revegetation.

Refer to Appendix A for standard and site-specific COAs that would mitigate impacts to surface water. Through the use of COAs and BMPs associated with construction activities, prompt interim reclamation, and the implementation of the preventative measures associated with the treatment of fluids, impacts to surface waters would be minimized and are expected to be negligible.

No Action Alternative

Under the No Action alternative, the well pad, road, and pipeline could be constructed under the authority of the COGCC to support the four Fee wells. Therefore, impacts to Waters of the U.S. under the No Action alternative would be similar to those under the Proposed Action with regard to surface disturbance (i.e., sediment transport) but proportionately less with regard to well-related impacts (i.e., pollutants).

Groundwater

Groundwater within the area of the newly proposed BBC Miller #10 well pad occurs primarily in alluvial aquifers. The valley-fill deposits or alluvium in the Colorado River basin consist generally of unconsolidated boulders, cobbles, gravel, sand, silt, and clay. The thickness of the alluvium is variable, but tends to be thinner in the upper reaches and thicker in the lower reaches. Generally, alluvial well depths are less than 200 feet and typically water levels range from 50 to 100 feet. The quality of alluvial groundwater in the Colorado River Basin can vary widely, and is affected by return flow quality, mineral weathering and dissolution, cation-anion exchange with alluvial minerals, and organic compound loading from fertilizer and pesticide leaching.

Although bedrock aquifer units are identified within the Piceance Basin, south of the Colorado River, these upper Tertiary-age aquifers have largely been eroded off, exposing the lower Green River and Wasatch Formations. The surface formation where the proposed wells will be located is the Wasatch Formation (Two). Although considered a confining unit, few fresh water wells are completed in the water bearing sands of the Wasatch Formation. These water bearing intervals are considered to be localized, due to the lenticular discontinuous nature of the strata.

Below the Wasatch Formation is the Cretaceous aged Mesaverde aquifer. This aquifer consists of sandstone with interbedded shales and coals of the Williams Fork Formation and the marine sands and shales of the Iles Formation. The depth to the top of this aquifer beneath the project area is more than 3,000 feet below ground surface (bgs), far too deep to be considered for production. The water quality of the Mesaverde aquifer is considered poor as well, due to the minerals nahcolite (NaHCO_3 , sodium bicarbonate), dawsonite ($\text{NaAl}(\text{OH})_2\text{CO}_3$), and halite (NaCl), with total dissolved solids (TDS) ranging in excess of 10,000 milligrams per liter (mg/L) at that depth in that portion of the basin (EPA 2004).

According to the CDWR database, five active registered fresh water wells are present within a 1-mile radius of the proposed well sites. Two of the wells are located within Section 31. The closer of these is located approximately 0.5 mile northeast of the new well pad. This domestic well has a shallow well depth of 100 feet and a water yield of 15 gallons per minute (gpm). No static water level is identified for this particular well. The other well in Section 31 is a monitoring hole located approximately 4,500 feet north and west of the proposed Miller #10 well pad. This 60-foot-deep well shows a static water level of 10 feet and yields 30 gpm. Another domestic well is located approximately 5,000 feet northwest in Section 36, T6S, R92W. This well has a shallow depth of 97 feet, a water level of 17 feet, and a well yield of 15 gpm. The final two wells identified within a 1-mile radius are located within Section 1, T7S, R92W. Only one of these wells is defined by quantitative data. It has a well depth of 140 feet, with no recorded static water level, and a yield for of 10 gpm.

Numerous wells are completed along West and East Divide Creeks, farther west and southwest of the proposed site. A cluster of very shallow monitoring wells is located in Section 12, T7S, R92W, to the southwest along West Divide Creek. Depths for these wells were recorded at 30 feet or less. The shallow well parameters for all wells identified indicate completions within alluvial sediments, typical for this part of the basin.

Environmental Consequences

Proposed Action

Potential impacts to groundwater resources from the proposed development plan would include contamination of the groundwater with produced water, drilling mud, and petroleum constituents. Hydraulic fracturing would be incorporated to complete the wells, which would include both fresh and produced water mixed with proppants, or propping agents. Typical proppants include sand, aluminum, glass, or plastic beads, mixed with water and minor amounts, less than 1%, of other compounds such as corrosion, friction, and scale inhibitors (EnerMax 2007). Propping agents are used to prop open the fractures created adjacent to the borehole during the fracturing process, allowing the gas trapped within the formation to travel freely up the borehole, where it is captured. Hydrofracturing would be conducted greater than 3,500 feet below ground surface (bgs) and is unlikely to cause impacts to groundwater found near the surface. With the use of proper construction practices, drilling practices, and BMPs, no significant adverse impact to groundwater aquifers is anticipated to result from the project (see Appendix B regarding cementing and casing programs).

No Action Alternative

The No Action alternative constitutes denial of the seven Federal wells associated with the Proposed Action. However, the four fee wells could be developed under the authority of the COGCC. Therefore, groundwater resources would still be identified and associated mitigation for the protection of these resources would still occur under COGCC authority. Proper casing and cementing procedures would be implemented to protect these resources.

OTHER AFFECTED RESOURCES

In addition to the critical elements discussed above, the resources presented in Table 7 (next page) were considered for impact analysis relative to the Proposed Action and No Action alternative. Resources that would be affected by the Proposed Action and No Action alternative are discussed following Table 7.

Access and Transportation

Affected Environment

Primary access to the area would be from I-70 at Silt, Colorado (Exit 97). Directions to the Miller #10 pad are as follows: After exiting I-70 proceed to the frontage road at the south end of the Silt/I-70 interchange; proceed east along this frontage road 0.4 mile to the intersection with CR 311; turn right and follow CR 311, cross the Colorado River, and continue 0.6 mile to the intersection with CR 331; turn left and follow CR 311 for 1.4 miles to the intersection with CR 335. Turn right at the intersection of CR 311 and CR 335, and follow CR 311 in a general southeasterly direction along Divide Creek approximately 5 miles and turn left on the dirt access road which leads into the project area. Heavy loads could access the Gibson Gulch project area using these routes as identified in Garfield County's "Road Haul Route Map" available on the Garfield County website (Garfield County 2008).

Table 7. Other Resources Considered in the Analysis			
<i>Resource</i>	<i>NA or Not Present</i>	<i>Present but Not Affected</i>	<i>Present and Affected</i>
Access and Transportation			X
Cadastral Survey	X		
Fire/Fuels Management	X		
Forest Management	X		
Geology and Minerals			X
Law Enforcement	X		
Paleontology			X
Noise			X
Range Management	X		
Realty Authorizations	X		
Recreation	X		
Socio-Economics			X
Soils			X
Vegetation			X
Visual Resources			X
Wildlife, Aquatic			X
Wildlife, Terrestrial			X

Environmental Consequences

Proposed Action

The Proposed Action would result in a substantial increase in truck traffic. The largest increase would be during rig-up, drilling, and completion activities. Data indicate that approximately 1,160 truck trips over a 30-day period would be required to support the drilling and completion of each well (Table 8). Once the wells are producing, traffic would decrease to occasional visits for monitoring or maintenance activities, and hauling produced water and condensate. Each well may have to be recompleted once per year, requiring three to five truck trips per day for approximately seven days.

Table 8. Traffic Associated with Drilling and Completion Activities		
<i>Vehicle Class</i>	<i>Number of trips per well</i>	<i>Portion of total</i>
16-wheel tractor trailers	88	7.6%
10-wheel trucks	216	18.6%
6-wheel trucks	452	39.0%
Pickup trucks	404	34.8%
Total	1,160	100.0%
Source: BLM 2006. Note: Trips by different vehicle types are not necessarily distributed evenly during the drilling process. Drilling and completion period is approximately 30 days per well.		

Degradation of field development roads may occur due to heavy equipment travel and fugitive dust and noise would be created. Mitigation measures (Appendix A) would be required as conditions of approval to ensure adequate dust abatement and road maintenance occur.

No Action Alternative

The No Action alternative would still allow for the construction of the Miller #10 well pad on Fee surface and the drilling of four wells into private mineral estate. The amount of traffic associated with the proposed project would be reduced, but not eliminated.

Geology and Minerals

Affected Environment

The project area is located near the eastern margin of the Colorado Plateau physiographic province (Fenneman 1946), a region characterized by dissected plateaus of strong relief. Outcropping on or near the land surface are thick layers of Tertiary bedrock mantled by unconsolidated, colluvial and alluvial deposits. The project area is located only 4 miles southwest of the Grand Hogback which marks the boundary of the Colorado Plateau and the Southern Rocky Mountains. Elevations within the project area range from approximately 5,630 to 7,080 feet above mean sea level. Thus, relief is approximately 1,450 feet.

The project area lies within a small structural basin located between the Divide Creek Anticline to the south and the Grand Hogback (a prominent, steeply southwest dipping monocline) to the north. The Wasatch Formation underlies the Miller #10 well pad, and is the predominant formation found in surface exposure within the area. The underlying Mesaverde Group is the target zone of the proposed drilling program.

Table 9 lists formations exposed at the surface within the project area and their characteristics.

Table 9. Geologic Formations within the Project Area				
<i>Map Symbol</i>	<i>Formation Name</i>	<i>Age</i>	<i>Characteristics</i>	<i>Location</i>
Qal	Alluvium	Pleistocene & Holocene	layered flood deposits of silt, sand, and gravel	drainage valleys & terraces
Qsw	Sheetwash deposits	Pleistocene & Holocene	poorly-layered, water-deposited silt, sand, and gravel	lower slopes above drainage valleys
Qls	Landslide deposits	Pleistocene & Holocene	heterogeneous rapid gravity flow deposits of clay- to boulder-sized materials	mesa side slopes
Qc	Colluvium	Pleistocene & Holocene	heterogeneous slow gravity flow deposits of clay- to boulder-sized materials	mesa side slopes
Qlo	Loess	Pleistocene	wind-blown silt deposits	mesa summits
Qbb	Basaltic boulder gravel	Pleistocene	weathered igneous deposits of Tertiary volcanic origin	mesa summits
Two	Wasatch formation	Eocene & Paleocene	Claystone, shale, siltstone, sandstone bedrock	outcrops on mesa sides and summits
Kmv	Mesaverde formation	Upper Cretaceous	Sandstone, shale, conglomerate bedrock with some coal beds	below Tw & not exposed in project area

Source: Tweto 1979, Ellis and Freeman 1984, Shroba and Scott 1997

Environmental Consequences

The proposed wells would penetrate the Mesaverde Group and overlying Wasatch Formation to develop natural gas resources. Production is derived from three reservoir intervals, which include the Wasatch Formation, the Williams Fork Formation, and Iles Formation. The latter two make up the Upper Cretaceous Mesaverde Group.

Mesaverde Group reservoirs are tight throughout most of the Piceance Basin, and generally become tighter with depth of burial (Spencer 1983). Tight reservoirs, defined as having low permeabilities (less than 0.1 millidarcy [md]), are subdivided into those having high porosity (HP) and low porosity (LP) characteristics. Mesaverde Group reservoirs of the southern Piceance Basin are LP gas reservoirs (Spencer, 1989). Substantial reserves have been known to be trapped within the tight sands of these reservoirs since the late 1950s, but only within the last decade, and particularly within the last few years, has the integrated application of new technologies turned the tight gas sands into a profitable play (Kuuskraa 1997). Natural fracture detection, advanced log analysis, more rigorous well completions and recompletions, and denser spacing have increased the amount of recoverable gas within these reservoirs.

The amount of natural gas that may be potentially produced can only be estimated based on production rates from nearby wells and adjacent fields. Reserves have been estimated to approach 2 billion cubic feet (bcf) of natural gas per well (Vargas 2006). If the wells become productive, initial production rates would be expected to be highest during the first few years of production, then steadily decline during the remainder of the economic lives of the wells. Most of the wells currently in production are estimated to have a life span between 30 to 35 years.

Specific casing depths will vary depending on well location and drilling conditions. Surface casing is utilized to protect and isolate usable water and potential production zones, and will be set at depths well below the depth to known aquifers within the area. If a water bearing, gas producing, lost circulation or pressurized zone is encountered below the surface casing, cement volumes will be adjusted to protect and further isolate those zones. This configuration is designed to prevent accidental contamination or leakage of hydrocarbons or drilling fluids from reaching usable water or productive zones within the wellbore.

No Action Alternative

Under the No Action alternative, APDs for the seven proposed Federal wells development would not be approved. Although the four Fee wells would likely be developed under COGCC authority, these would not cause impacts to geologic and mineral resources would occur on Federal mineral estate.

Noise

Affected Environment

Noise is generally described as unwanted sound and is measured as sound pressure in units of decibels (dBAs). The decibel scale is logarithmic, or nonlinear, because the range of sound that can be detected by the human ear is so great that it is convenient to compress the scale to encompass all the sounds that need to be measured. Each 20-unit increase in the decibel scale increases the sound loudness by a factor of 10.

Sound levels have been calculated for areas that exhibit typical land uses and population densities. In rural recreational areas, ambient sound levels are expected to be approximately 30 to 40 dBA (EPA 1974, Harris 1991). The proposed project would be located in a rural, sparsely-populated area with few potential noise sources. Noise levels from human activity are mostly mechanical, consisting mainly of existing oil and gas wells, new exploration activities, and ranching/farming operations. Human noise is

widely dispersed throughout the area, and there are few impacts associated with industrial noise sources and vehicular traffic. As a basis for comparison, the noise level during normal conversation of two people 5 feet apart is 60 dBA.

Highway I-70 is the only high-speed road within the vicinity of the plan area, and it is not anticipated to significantly contribute to the existing noise levels because of its distance (greater than 1 mile) from the area. Roadway traffic on county roads and BLM roads in the area contributes to noise, but this source is transient, produced primarily by vehicles used for exploration and maintenance.

Noise from oil and gas development comes from a number of sources: truck traffic, drilling and completion activities, well pumps, and compressors. Table 10 summarizes noise levels of typical construction equipment; Table 11 summarizes noise levels for a number of oil and gas activities. Noise levels experienced by a receptor depend on the distance between the receptor and the equipment, the topography, vegetation, and meteorological conditions (e.g., wind speed and direction, temperature, humidity).

Table 10. Noise Standards for Light industrial, Residential/Agriculture/Rural		
<i>Zone</i>	<i>7:00 A.M. to next 7:00 P.M</i>	<i>7:00 P.M. to next 7:00 A.M</i>
Light Industrial	70 dBA	65 dBA
Residential/Agricultural/Rural	55 dBA	50 dBA

Note: The allowable noise level for periodic, impulsive or shrill noises is reduced by 5 dBA from the levels shown (COGCC 2006).

Table 11. Noise Levels at Typical Construction Sites, Access Roads, and Well Pads			
<i>Equipment</i>	<i>Noise Level (dBA)</i>		
	<i>50 feet</i>	<i>500 feet</i>	<i>1,000 feet</i>
Air Compressor, Concrete Pump	82	62	56
Backhoe	85	65	59
Bulldozer	89	69	63
Crane	88	68	62
Front End Loader	83	63	57
Heavy Truck	88	68	62
Motor Grader	85	65	59
Road Scraper	87	67	61
Tractor, Vibrator/Roller	80	60	54

Sources: BLM (1999a), La Plata County (2002)

Environmental Consequences

Proposed Action

Overall, ambient sound levels within the vicinity of the plan area are likely to be slightly elevated above the typical levels for rural recreational areas. Sensitive noise receptors include wildlife and recreationists (e.g., hunters) visiting the area for solitude and a sense of remoteness. The closest residence belongs to Miller Land & Cattle Company, located approximately 4,000 feet from the proposed pad. The November

2006 revised COGCC noise control rules call for noise levels from oil and gas operations at any well site and/or gas facility to comply with the following maximum permissible levels (Table 10).

Construction of the Miller #10 pad and drilling and completion of the wells would result in increased noise levels above the general background levels during all phases of project development. Noise levels during road, well pad, and pipeline construction would be temporary and most noticeable at the construction site and along the access roads used by project-related traffic. Typical noise levels from construction sites at 50 feet are around 85 dBA (Table 11). Based on the Inverse Square Law of Noise Propagation (Harris 1991) and a typical average construction site noise level of 65 dBA at 500 feet (Table 11), construction noise would average around 59 dBA at 1,000 feet, roughly equivalent to those of typical light industrial area (EPA 1974).

Noise levels around the well pads during drilling and completion activities would also increase above the general background levels. These elevated levels would last approximately 40 to 60 days at each well. Noise would occur continuously, 24 hours per day, during the drilling and completion period. Since the closest residence is approximately 4,000 feet from the project area, noise levels experienced by area residents would be substantially less.

Traffic noise levels would also be elevated throughout the project. The greatest increase would be along access roads during drilling and completion, because this would include the heaviest traffic volume and travel by the largest equipment. Based on the La Plata County data presented in Table 11, approximately 68 dBA of noise (at 500 feet) would be created by each fuel and water truck (included in the heavy truck category in Table 11). Less noise would be created by smaller trucks and passenger vehicles such as pickup trucks and sport utility vehicles. Although the duration of increased noise from this source would be short, it would occur repeatedly during the drilling and completion phases.

Noise impacts would decrease after construction and drilling activities are completed and the production phase begins but would still be above background noise levels. Permanent sources of noise and noise level increases would be associated with an increase in periodic truck traffic to the well sites. During maintenance and workovers, noise levels would increase somewhat above levels associated with routine well production. This increase is not anticipated to be significant to residents, owing to the distance of 4,000 feet to the nearest dwelling, and would be infrequent and of short duration.

No Action Alternative

The No Action alternative constitutes denial of the seven Federal wells associated with the Proposed Action. However, the four fee wells could be developed under the authority of the COGCC. Therefore, noise levels associated with construction of the pad, access road, and pipeline and with drilling, completion, and production of the four Fee wells would be similar to those under the Proposed Action. The duration of impacts would be shortened proportionately, and would noise associated with vehicular traffic during long-term production.

Paleontology

Affected Environment

The predominant bedrock formations present at or near the surface within the boundary of the project area are the Wasatch Formation (including the Fort Union Formation or equivalent at its base) and the Ohio Creek formation. Isolated areas of Quaternary gravels and alluvium, wind-blown loess, colluvium, and weathered volcanic boulders and gravel are interspersed throughout the area and cover older Wasatch formation sediments. Occurring in varying thicknesses, these Quaternary sediments are considered

Potential Fossil Yield Classification (PFYC) Class 2, defined as having a low probability of fossil occurrence. Class 2 geologic units are not likely to contain vertebrate or scientifically significant invertebrate fossils.

The Wasatch Formation is a PFYC Class 4/5 formation, defined as an area that is known to contain vertebrate fossils or noteworthy occurrences of invertebrate fossils. These types of fossils are known to occur or have been documented, but may vary in occurrence and predictability. The Wasatch Formation is divided into the early Eocene Shire, and the Paleocene age Molina and Atwell Gulch members. All members of the Wasatch Formation contain vertebrate fossils in varying abundances (Murphy and Daitch 2007). Rocks of the Wasatch Formation are lithologically very similar to one another throughout the Piceance Creek Basin as heterogeneous continental fluvial deposits with interfingering channel sandstone beds and over bank deposits consisting of variegated claystone, mudstone, and siltstone beds (Franczyk et al. 1990). Eocene mammals have been found in the lower part of the Shire member.

Fossils historically identified in the Wasatch are archaic mammals—including marsupials, representatives of two extinct orders of early mammals (pantodonts and creodonts), artiodactyls (deer-like, even-toed ungulates), ancestral horses and other perissodactyls (odd-toed ungulates), carnivores, and primates—as well as birds, lizards, turtles, crocodilians, gars and other fishes, freshwater clams, gastropods (snails), and other invertebrates (BLM 1999).

Environmental Consequences

Proposed Action

Although mapped as the predominant surface formation, field inspection revealed the Wasatch exposed only in a few outcrops found on mesa sides and summits. The thickness of the Quaternary sediments cannot be accurately determined, but construction activities have the potential to adversely affect important fossils that may be present in the underlying Wasatch Formation. The greatest potential for impacts is associated with excavation of shallow bedrock that may be unearthed during well pad and facilities (especially pipeline) construction. In general, alluvium, colluvium and other unconsolidated sediments are much less likely to contain well preserved plant and animal remains than intact bedrock.

An examination of the BLM paleontology database indicates that there are no known fossil occurrences within a 1-mile radius of the proposed well sites. The nearest fossil discovery site is found approximately 1.2 miles southwest in Section 1, T7S, R92W. Two additional sites are found over 2 miles farther to the southwest in SE Section 11, T7S, R92W. As a result of the onsite inspection, paleontological resources are not expected to be impacted by construction activities of this development plan. In the event that discovery sites are encountered, a standard paleontological condition of approval would be attached to the APDs submitted for the planned Federal wells (Appendix A).

No Action Alternative

Under the No Action alternative, the seven Federal wells would not be authorized, but the four Fee wells would likely be developed under COGCC authority. Regardless of whether the Federal wells are developed, no impacts to Federal paleontological resources would occur, since the proposed disturbance would be located on private land.

Socioeconomics

Affected Environment

The Proposed Action is located within Garfield County, Colorado. The population of Garfield County has grown by approximately 2.8% per year from 2000 to 2005, resulting in an increase from 44,300 to 51,000 residents (U.S. Bureau of the Census 2005). Population growth in Garfield County is expected to more than double over the next 20 years from over 50,000 in 2005 to 116,000 in 2025 (Colorado Department of Local Affairs 2007).

In the year 2000, industry groups in Garfield County with the highest percentage of total employment were construction (20.4%), tourism (10.7%), retail trade (13.7%), and education and health (15.4%). An estimated 13.3% of the population was retired in the year 2000 and did not earn wages. Employment in agriculture, forestry, hunting, and mining accounted for 2.4% of total employment.

Personal income in Garfield County has also risen, growing 120% from \$513 million in 1990 to \$1.1 billion in 2000. Annual per capita income has grown by 50% during the same period, from about \$17,000 to \$26,000 (USDI 2006) and the average earnings per job in 2005 was approximately \$37,500 (Garfield County 2007). The communities of Parachute, Silt, and Rifle are considered the most affordable for housing; the communities of Battlement Mesa, New Castle, and Glenwood Springs the least affordable where the cost to rent or own similar housing may be 50% higher or more (USDI 2006).

Activities on public land in the vicinity of the plan area are primarily ranching/farming, hunting, and the development of oil and gas resources. Hunters contribute to the economy because many require lodging, restaurants, sporting goods, guides and outfitting services, food, fuel, and other associated supplies and services. Big game hunting, in particular, is viewed as critical to the economy of Garfield County, and especially to the local community economies that depend on BLM and Forest Service public lands where most hunting occurs (USDI 2006). Expenditures by hunters in the Roan Plateau Planning Area have been estimated to be as much as \$1 million annually, with perhaps an additional \$1 million annually of indirect and local expenditures (CDOW 1995 in USDI 2006).

The growth of the oil and gas industry in the past 10 years has been increasingly important to local economies (USDI 2006). Oil and gas production in Garfield County has increased more than three-fold during the past five years from 70 billion cubic feet (BCF) in 2000 to more than 235 BCF in 2005 (COGCC 2006 in USDI 2006). In addition, Garfield County has experienced the fastest oil and gas development in Colorado with 1,800 drilling permits issued in 2005 (USDI 2006). In 2005, 60 drill rigs were operating in Garfield County, and a new well was estimated to be drilled every 15 to 20 days (COGCC 2006 in USDI 2006). While the number of workers employed in the mining and extraction industry in Garfield County has been shown to be only 1.7%, this number is considered misleading because some oil and gas employment has been incorporated as part of the construction sector statistics instead (USDI 2006). For example, in the year 2005, an estimated 4000 persons were directly employed by gas development companies and their subcontractors in Garfield County (Garfield County 2007).

The Federal government makes "Payments in Lieu of Taxes" (PILT) to county governments to help offset property tax revenue lost of nontaxable Federal lands within county boundaries (USDI 2006). Payments are based on Federal acreage in the county for all land management agencies, including BLM, U.S. Forest Service, U.S. Fish and Wildlife Service, and National Park Service. The amount may also be adjusted based on population and as appropriated by Congress. By formula, payments are decreased as other Federal funds, such as mineral royalty payments, increase. PILT received by Garfield County in the last 4 years has been as follows: \$1,170,205 in 2004; \$808,348 in 2005; \$1,065,158 in 2006; and \$1,078,087 in 2007 (USDI/NBC 2008).

In addition, to PILT payments, the BLM shares revenue generated by commercial activities on public lands with State and county governments (USDI 2006). Federal mineral royalties are levied on oil and gas production from Federal mineral leases. Oil and gas lessees pay royalties equal to 12.5% of the wellhead value of oil and gas produced from public land. Half the royalty receipts are distributed to Colorado. The amount distributed to Garfield County in 2002 attributable to oil and gas production was \$5.5 million. In 2001, the amount was \$14.1 million (USDI 2006). These funds are then allocated to fund county services, schools, and local communities.

Property tax revenue from oil and gas development has also become the largest source of public revenue in Garfield County (USDI 2006). In the year 2007, oil and gas assessed valuation in Garfield County amounted to \$1,867,927,350 or about 65% of total assessed value. Total tax revenues from property taxes and special district levies were \$130,180,686. Tax dollar distributions in 2007 were Schools 37%, County 30%, Special Districts 13%, Fire Districts 10%, Colleges 8%, and Towns 2%.

The NEPA process requires a review of the environmental justice issues as established by Executive Order 12898 (February 11, 1994). The order established that each Federal agency identify any “disproportionately high and adverse human health or environment effects of its programs, policies, and activities on minority and low-income populations.” The Latino community is the only minority population of note in the vicinity of the project area. In 2000, 16.7% of the residents of Garfield County identified themselves as Hispanic or Latino, which is close to the state average (17.1%). African Americans, American Indians, and Pacific Islanders account for less than 1% of the Garfield County population, which is below the state levels.

Environmental Consequences

Proposed Action

The Proposed Action would positively impact the local economies of Garfield County through the maintenance of existing job opportunities created by the oil and gas industry and in supporting trades and services in recent years. In addition, local governments in Garfield County would receive tax and royalty revenues. Some minor economic loss to private landowners or hunting guides may result from the potential displacement of big game and resulting reduction in big game hunting within the project area. However, given the small scale of this project, any such impact would be negligible.

The Proposed Action could result in minor negative social impacts, including reductions in recreational character and scenic quality and increases in fugitive dust emissions and traffic. Again, however these impacts would be minor, mostly temporary, and on private rather than public land.

No Action Alternative

Under the No Action alternative, the seven Federal wells would not be authorized, but the four Fee wells would likely be developed under COGCC authority. Therefore, socioeconomic impacts, both positive and negative, related to the development of oil and gas resources would be proportionately less under this alternative compared to the Proposed Action. Impacts related to surface disturbance would be similar under both alternatives.

Soils

Affected Environment

According to the *Soil Survey of Rifle Area, Colorado* (USDA 1985), the proposed activities would be located on two separate soil complexes. Most of the pad would be located on Potts loam, 6 to 12 percent slopes. This soil complex consists of deep, well-drained soils that formed in alluvium from sandstone, shale, or basalt. Potts soils are found on moderately sloping mesas, benches, and valley sides at elevations ranging from 5,000 to 7,000 feet. The soil is used mainly for grazing, wildlife habitat, and limited dryland farming. Although this soil is well-drained, it has slow surface runoff and the erosion hazard is classified as severe.

Some portions of the pad would be located on Torriorthents-Camborthids-Rock outcrop complex, steep slopes. This broadly-defined soil complex is found on foothills and mountainsides at a wide range of elevations; it is used for grazing, wildlife habitat, and recreation. The parent material for this soil complex consists of sandstone and shale, with occasional concentrations of basalt and limestone. This clayey to loamy soil has moderate to severe erosion hazard.

Environmental Consequences

Proposed Action

The impact of construction activities on soil erosion is a function of slope angle, slope length, soil type, and vegetation cover. The project area is characterized as semi-arid. Lack of moisture associated with the semi-arid climate has suppressed vegetation growth and slowed the chemical and biological processes commonly associated with soil development (BLM 1994). In addition, soil fertility is hampered by high salinity and susceptibility to wind and water erosion. Soils in the project area support low-density livestock grazing and wildlife habitat, but generally have a poor revegetation potential due to these limiting factors.

Because none of the proposed surface disturbance would occur on Federal surface or split-estate lands, lease stipulations related to steep slopes and fragile soils would not apply. However, particular care should be taken to ensure that proper BMPs are utilized to prevent erosion and slope instability due to construction activities.

No Action Alternative

Even if BLM were to deny the seven Federal wells, four Fee wells would be built under the authority of the COGCC, resulting in similar surface disturbance from pad construction, access road construction, and pipeline installation. Therefore, this alternative would have the same potential for impacts to slope and soil stability as the Proposed Action.

Vegetation

Affected Environment

The project area consists of a Utah juniper (*Juniperus utahensis*) woodland with pinyon pine with pinyon pine (*Pinus edulis*) as a minor component. Wyoming sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) is the dominant understory shrub. Several other shrub species also occur in this community, including bitterbrush (*Purshia tridentata*) and snakeweed (*Gutierrezia sarothrae*). In general, the sparse herbaceous layer consists of graminoids, including two non-native annual grasses (cheatgrass and bulbous bluegrass) in addition to native perennial grasses such as western wheatgrass (*Pascopyrum smithii*),

Indian ricegrass (*Achnatherum hymenoides*), and squirreltail (*Elymus elymoides*). Forbs are a minor component.

Environmental Consequences

Proposed Action

Direct effects to vegetation under the Proposed Action would include short- and long-term losses of vegetation and long-term modification of community structure and composition. The total short-term surface disturbance resulting from the proposed exploration and development activities would be 4.57 acres, of which 1.3 acres of disturbance would remain for the life of the project. All of the disturbance would occur on private land. The Proposed Action would result in an increase in the relative proportion of herbaceous, non-woody species in the areas of disturbance.

Short-term impacts would occur during construction, drilling, and completion activities and would be restored during interim reclamation. Impacts in areas of interim reclamation are considered short term because reclamation would be initiated within 2 years. However, a substantially longer period, typically more than 5 years and up to a few decades, would be required for the establishment of a self-sustaining native plant community that meets reclamation standards for cover and species composition. For habitats dominated by shrubs, several decades may be required for restoration to suitable conditions, depending on site-specific factors such as soil type, soil moisture, topography (slope, aspect, and elevation), and exposure to grazing by wild or domestic herbivores.

Indirect effects to vegetation that may result from implementation of the Proposed Action are as follows. Surface disturbance would increase the potential for noxious weed invasion and spread. Soil erosion and sedimentation may increase at locations of pads and access roads, but soil conditions would improve in the long-term in the treated areas. Changes to habitat quantity and quality would occur throughout the project area. Negative impacts would be minimized by implementing mitigation measures as presented in Appendix A.

No Action Alternative:

Under the No Action alternative, the seven Federal wells would not be authorized, but the pad, access road, and pipeline could be developed under COGCC authority. As a result, direct and indirect impacts to vegetation would be similar to those under the Proposed Action.

Visual Resources

Affected Environment

The Proposed Action is located in an area that received a *Visual Resource Management (VRM) Class III* designation in the 1984 Glenwood Springs Resource Management Plan. The objective for this class is to provide for management activities that may require moderate change to existing characteristics of the landscape. Changes to the landscape should still repeat basic elements found in natural features in the project area. Management activities may attract attention, but should not dominate the view of the casual observer.

Despite this designation, the Proposed Action would take place on private lands, where visual resource management objectives do not apply. VRM classes shown for non-public lands are an indication of the visual values for those lands, and those values are only protected by landowner discretion.

Environmental Consequences

Proposed Action

The Proposed Action would result in short-term visual impacts from construction, drilling, and completion activities. The existing landscape would be changed by the introduction of new elements of line, color, form, and texture. There would be an increase in the presence of drilling rigs, heavy equipment (e.g., dozers, graders, etc.), and vehicular traffic, with an associated increase in dust, light pollution, and well flaring.

The expansion of existing pads, supporting infrastructure and improved access roads will create long-term contrasts within the existing landscape by removing the existing vegetation and exposing bare ground. The visibility of new areas of surface disturbance and production equipment would increase the visual contrasts associated with human modifications in color, line, form and texture. However, interim reclamation of the well pad would reduce some of the contrast after two to three growing seasons, and the use of natural colors on production equipment would mitigate long-term impacts (Appendix A).

Construction activities would occur over a 2- to 4-week period. Drilling and completion activities would occur 24 hours per day for a 30- to 60-day period. Consequently, the drill rig, other large equipment, lights, and well flaring would be visible in the night sky for up to two months at each well location.

No Action Alternative

Under the No Action Alternative, development of the four Fee wells would still occur, and the BLM would have no authority to manage visual resources and suggest possible mitigation. The private surface owner would have discretion over the protection of the visual characteristics of the landscape.

Wildlife, Aquatic

Affected Environment

Divide Creek is a perennial stream located approximately 1.5 miles from the proposed pad location. Runoff from the project area drains into Divide Creek through East Gulch drainage, which is ephemeral and therefore do not support fish. Divide Creek, a tributary of the Colorado River, supports numerous native and non-native fish species and a variety of aquatic macroinvertebrates.

Environmental Consequences

Proposed Action

Construction activities associated with the proposed project would initially remove approximately 7.64 acres of upland vegetation. Some areas would be revegetated but total long-term upland habitat loss would total about 3.95 acres. This would result in both short-term and long-term erosion and soil loss. Short-term losses would result where all soils are disturbed until such time as adequate revegetation is in place to stabilize soils. Long-term soil loss and sedimentation would be associated with the new roads, which would be in use for several years. Sediment can adversely affect fish species that prefer clear water and clean gravels for spawning. Sediment can smother fish eggs, reduce water quality, and also reduce aquatic insect productivity. Mitigation measures described for soil and surface water and attached as COAs (Appendix A) are expected to reduce the potential for transport of sediments or chemical pollutants to negligible levels.

No Action Alternative

Even if BLM were to deny the seven Federal wells, four Fee wells would be built under the authority of the COGCC, resulting in similar surface disturbance from pad construction, access road construction, and pipeline installation. Therefore, this alternative would have the same potential for impacts to slope and soil stability and sediment transport to streams as the Proposed Action. However, impacts related to wells and other surface facilities, potentially included transport of pollutants into streams, would be reduced proportionately.

Wildlife, Terrestrial

Affected Environment

Mammals

The following summary focuses on species for which seasonal ranges have been delineated by CDOW (2008) and for which BLM has outlined associated management objectives. The project area is located within overall range for mule deer (*Odocoileus hemionus*) as well as winter range, winter concentration area, and severe winter range for both mule deer and Rocky Mountain elk (*Cervus elaphus nelsonii*) (CDOW 2008). The CDOW monitors and manages these populations in Data Analysis Units (DAU) and Game Management Units (GMU). The site is found in deer DAU D-12, and elk DAU E-14, and in GMU 42.

Numbers of mule deer and elk vary naturally due to a variety of environmental and biological factors and in response to hunting pressure and other human-causes influences. Populations of both species have varied dramatically over the past several decades. Mule deer numbers were substantially higher in the early 1960s, subsequently declined dramatically, but are gradually recovering. Elk numbers have varied in response to winter die-offs and probably other factors but have steadily increased over the past several years. Past use coupled with ongoing current use of limited winter range habitats by both species may at least in part account for the less than desirable range conditions (browse species condition) found in some areas. Mule deer and elk concentration on winter range and repeated heavy use of browse species can reduce plant vigor and productivity over time.

Factors believed to be acting on localized deer and elk populations include increasing oil and gas development; construction of linear infrastructure such as roads, powerlines, and pipelines; industrial, commercial, and residential development associated with the overall human population growth of the area; and disturbance associated with increased human presence and activity in areas of winter range. The potential for impacts to localized deer and elk populations from these factors is exacerbated by the fact that winter range habitats are relatively limited in areal extent and—being located at lower elevations—are more commonly associated with private lands that are more vulnerable to development.

Small mammals present within the planning area, including rodents such as the rock squirrel (*Spermophilus variegatus*), golden-mantled ground squirrels (*Spermophilus lateralis*), least chipmunk (*Tamias minimus*), and packrat (bushy-tailed woodrat) (*Neotoma cinerea*); lagomorphs such as the desert cottontail (*Sylvilagus audubonii*) and black-tailed jackrabbit (*Lepus californicus*); and small carnivores such as the striped skunks (*Mephitis mephitis*), spotted skunk (*Spilogale gracilis*), and raccoon (*Procyon lotor*), and ringtail (*Bassariscus astutus*). These species are most likely to occur along the drainages, near the margins of dense oakbrush, in pinyon-juniper woodland, or around rock outcrops. Rodents and, to a lesser extent lagomorphs, are the primary prey base for a variety of avian and mammalian predators.

Larger carnivores expected to occur include the bobcat (*Lynx rufus*) and coyote (*Canis latrans*). Black bears (*Ursus americanus*) make use of oaks and associated chokecherries and serviceberries for cover and food, while mountain lions (*Felis concolor*) are likely to occur during winter when mule deer (*Odocoileus hemionus*) are most abundant in the area.

Reptiles and Amphibians

Reptile species most likely to occur include the western fence lizard (*Sceloporus undulatus*) and gopher snake (bullsnake) (*Pituophis catenifer*) in xeric shrublands or grassy clearings and the western terrestrial garter snake (*Thamnophis elegans*) along creeks. Other reptiles potentially present along creeks, although more commonly found at lower elevations than the site, are the plateau racerunner (*Cnemidophorus velox*), milk snake (*Lampropeltis triangulum*) and smooth green snake (*Opheodrys vernalis*).

Besides the special-status amphibians described previously (northern leopard frog and Great Basin spadefoot), amphibians potentially present in the project vicinity include the tiger salamander (*Ambystoma tigrinum*), Woodhouse's toad (*Bufo woodhousii*), and northern chorus frog (*Pseudacris triseriata*).

For all of these "herptiles," impacts from the project would occur primarily during earthmoving operations or mortality from vehicles. The amphibians are also vulnerable to impacts that affect water quality or quantity. However, the site contains only minimal habitat for the reptiles and no habitat for the amphibians except for impacts in downstream surface waters. Therefore, impacts of these species, if they occur would be negligible and not affect the overall population.

Birds

Passerine (perching) birds commonly found in the area in addition to those addressed previously under Migratory Birds and Special-Status Species include residents or short-distance migrants such as the western scrub-jay (*Aphelocoma californica*), black-billed magpie (*Pica pica*), American robin (*Turdus migratorius*), Townsend's solitaire (*Myadestes townsendi*), blue-gray gnatcatcher (*Poliptila caerulea*), mountain chickadee (*Poecile gambeli*), and house finch (*Carpodacus mexicanus*). The area also is suitable habitat, although marginally so, for the wild turkey (*Meleagris gallopavo*).

No raptors were found during project-specific surveys in 2010. Resident birds of prey likely to occur in the project vicinity, in addition to those discussed in the sections on Migratory Birds and Special-Status Species, include the Cooper's hawk (*Accipiter cooperii*), sharp-shinned hawk (*A. striatus*), red-tailed hawk (*Buteo jamaicensis*), and great horned owl (*Bubo virginianus*). All of these species could nest in larger pinyon-juniper trees within or near the site but are more likely to be found in areas with taller conifers, cottonwoods, or mature aspen. Another species, the prairie falcon (*Falco mexicanus*), nests on cliffs and would therefore not nest nearby but could hunt over the site—although it prefers more open grassland or low shrubland habitats.

Environmental Consequences

Proposed Action

The Proposed Action is estimated to result in the direct loss or fragmentation of 7.64 acres of wildlife habitat in the project area due to construction of new well pads, access roads, and pipelines. Reclamation of pipelines and temporary disturbances associated with road construction and interim reclamation of well pads would reduce this total to approximately 3.95 acres for the remainder of oil and gas production.

A larger area would be subject to indirect habitat loss as a result of disturbance. Human activity, including vehicular traffic and the operation of heavy equipment, can cause deer, elk, and other species to avoid areas of otherwise suitable habitat. Even when wildlife sensitive to disturbance do not avoid an area altogether, the changes in their movement patterns can result in greater use of less suitable habitats and increased physiological stress. These impacts are more significant during critical seasons such as winter, when cold temperatures, reduced forage quality, and reduced forage availability due to snow cover deplete their energy stores accumulated during summer and fall.

Another adverse impact of indirect habitat loss can occur in winter range that supports both deer and elk. Although these species compete to some extent for the same foods, particularly during winter, elk are generally able to tolerate colder temperatures and deeper snow cover. If disturbance from human activity and infrastructure affects the distribution of elk and causes them to congregate into smaller areas, the elk can out-compete deer for food and cause them to shift their patterns of use even farther.

The extent of indirect habitat loss varies by species, the type and duration of the disturbance, and the amount of screening provided by vegetation and topography. In general, disturbance-related impacts are temporary, with patterns of distribution and habitat use returning to pre-disturbance conditions rather quickly when the disturbance stops.

No Action Alternative

Under the No Action alternative, the seven Federal wells would not be authorized, but the pad, access road, and pipeline could be developed under COGCC authority. As a result, direct and indirect impacts to vegetation would be similar to those under the Proposed Action. However, because only the four Fee wells would be developed, impacts associated with vehicular traffic would be reduced proportionately, and impacts associated with drilling and completion activities would have a shorter duration.

SUMMARY OF CUMULATIVE IMPACTS

Until relatively recently, modifications of the region have been characteristic of agricultural and ranching lands, with localized industrial impacts associated with the railroad and I-70 corridors. More recently, residential and commercial growth, oil and gas development, and mining of sand and gravel along the Colorado River have increased throughout most of the CRVFO area. These have accelerated the accumulation of impacts in the area, including (1) direct habitat losses; (2) habitat fragmentation and losses in habitat effectiveness; (3) elevated potential for runoff, erosion, and sedimentation; (4) expansion of noxious weeds and other invasive species; and (5) increased noise and traffic and reductions in the scenic quality of the area (BLM 1999: 4-1 to 4-68).

Although none of the cumulative impacts described in the 1999 FSEIS was characterized as significant, and while new technologies and regulatory requirements have reduced the impacts of some land uses, it is nonetheless clear that past, present, and reasonably foreseeable future actions has had and would continue to have adverse affects on various elements of the human environment. The anticipated impact levels for existing and future actions range from negligible to locally major, and primarily negative, for specific resources. The primary reasons for this assessment are twofold: First, the rate of development, particularly oil and gas development, has until recently been increasing in the area, resulting in an accelerated accumulation of individually nominal effects; and second, residential and commercial expansion, as well as most of the oil and gas development, has occurred on private lands where mitigation measures designed to protect and conserve resources are generally less extensive.

It is clear that the Proposed Action would contribute to the collective adverse impact for some resources. Although the contribution would be very minor, the Proposed Action would contribute incrementally to

the collective impacts to air quality, surface water quality, native vegetation, migratory birds, aquatic and terrestrial wildlife, and other resources.

PERSONS AND AGENCIES CONSULTED

Matt Barber, Tracey Fallang, Jeff Fandrich, Monty Shed – Bill Barrett Corporation
Dave Kubeczko – Colorado Oil and Gas Conservation Commission
Nikki Reckles – Garfield County Oil and Gas Liaison Office

INTERDISCIPLINARY REVIEW

Table 12 lists the individuals who contributed to the preparation of this EA.

Table 12. BLM Interdisciplinary Team Authors and Reviewers		
<i>Name</i>	<i>Title</i>	<i>Areas of Participation</i>
Vanessa Bull	Natural Resource Specialist	Project Lead, Access and Transportation, Socioeconomics, Visual Resources
Allen Crockett	Supervisory Natural Resource Specialist/Physical Scientist	NEPA Review
Beth Brenneman	Ecologist	Invasive Non-native Species, Special-Status Species (Plants), Vegetation
Sylvia Ringer	Wildlife Biologist	Migratory Birds, Special Status-Species (Animals), Aquatic and Terrestrial Wildlife
Cheryl Harrison	Archaeologist	Cultural Resources, Native American Religious Concerns
Karen Conrath	Geologist	Groundwater, Paleontology, Geology and Minerals
Jeff O’Connell, Noel Ludwig	Hydrologist	Air Quality, Noise, Soil, Surface Water, Waters of the U.S., Wetlands and Riparian Zones
Will Howell	Petroleum Engineer	Downhole Conditions of Approval

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The environmental assessment analyzing the environmental effects of the Proposed Action has been reviewed. The approved mitigation measures result in a Finding of No Significant Impact on the human environment. Therefore, an environmental impact statement is not necessary to further analyze the environmental effects of the Proposed Action.

DECISION RECORD

DECISION: It is my decision to approve the Proposed Action presented in this EA (DOI-BLM-CO-N040-2010-0055-EA). This decision will provide for the orderly, economical, and environmentally sound exploration and development of oil and gas resources on valid oil and gas leases.

RATIONALE: The bases for this decision are as follows:

1. Approval of the Proposed Action is validating the rights granted with the Federal oil and gas leases to develop the leasehold to provide commercial commodities of oil and gas.
2. Environmental impacts would be avoided or minimized by best management practices and mitigation measures included in the Proposed Action or to be applied and enforced by BLM as Conditions of Approval (COAs).

This decision does not authorize the development of new Federal oil and gas wells on new or existing well pads. Development of Federal wells would not commence until approval by BLM of Applications for Permits to drill the Federal wells, including applicable COAs.

MITIGATION MEASURES: Mitigation measures presented in Appendix A will be incorporated as Conditions of Approval for the protection of surface and subsurface resources.

NAME OF PREPARER: Vanessa Bull, Physical Scientist, Project Lead

SIGNATURE OF AUTHORIZED OFFICIAL:



Supervisory Natural Resource Specialist

DATE SIGNED: _____

6/21/10

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APPENDIX A
Surface Use Conditions of Approval

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STANDARD SURFACE USE CONDITIONS OF APPROVAL
DOI-BLM-CO-N040-2010-0055-EA

1. Administrative Notification. The operator shall notify the BLM representative at least 48 hours prior to initiation of construction.
2. Road Construction and Maintenance. Roads shall be crowned, ditched, surfaced, drained with culverts and/or water dips, and constructed to BLM Gold Book standards. Initial gravel application shall be a minimum of 6 inches. The operator shall provide timely year-round road maintenance and cleanup on the access roads. A regular schedule for maintenance shall include, but not be limited to, blading, ditch and culvert cleaning, road surface replacement, and dust abatement. When rutting within the traveled way becomes greater than 6 inches, blading and/or gravelling shall be conducted as approved by the BLM.
3. Dust Abatement. The operator shall implement dust abatement measures as needed to prevent fugitive dust from vehicular traffic, equipment operations, or wind events. The BLM may direct the operator to change the level and type of treatment (watering or application of various dust agents, surfactants, and road surfacing material) if dust abatement measures are observed to be insufficient to prevent fugitive dust.
4. Drainage Crossings and Culverts. Construction activities at perennial, intermittent, and ephemeral drainage crossings (e.g. burying pipelines, installing culverts) shall be timed to avoid high flow conditions. Construction that disturbs any flowing stream shall utilize either a piped stream diversion or a cofferdam and pump to divert flow around the disturbed area.

Culverts at drainage crossings shall be designed and installed to pass a 25-year or greater storm event. On perennial and intermittent streams, culverts shall be designed to allow for passage of aquatic biota. The minimum culvert diameter in any installation for a drainage crossing or road drainage shall be 24 inches. Crossings of drainages deemed to be jurisdictional waters of the U.S. pursuant to Section 404 of the Clean Water Act may require additional culvert design capacity. Due to the flashy nature of area drainages and anticipated culvert maintenance, the U.S. Army Corps of Engineers (USACE) recommends designing drainage crossings for the 100-year event. Contact the USACE Colorado West Regulatory Branch at 970-243-1199.

Pipelines installed beneath stream crossings shall be buried at a minimum depth of 4 feet below the channel substrate to avoid exposure by channel scour and degradation. Following burial, the channel grade and substrate composition shall be returned to pre-construction conditions.

5. Jurisdictional Waters of the U.S. The operator shall obtain appropriate permits from the U.S. Army Corps of Engineers (USACE) prior to discharging fill material into waters of the U.S. in accordance with Section 404 of the Clean Water Act. Waters of the U.S. are defined in 33 CFR Section 328.3 and may include wetlands as well as perennial, intermittent, and ephemeral streams. Permanent impacts to waters of the U.S. may require mitigation. Contact the USACE Colorado West Regulatory Branch at 970-243-1199. Copies of any printed or emailed approved USACE permits or verification letters shall be forwarded to the BLM.
6. Wetlands and Riparian Zones. The operator shall restore temporarily disturbed wetlands or riparian areas. The operator shall consult with the BLM Colorado River Valley Field Office to determine appropriate mitigation, including verification of native plant species to be used in restoration.

7. Reclamation. The goals, objectives, timelines, measures, and monitoring methods for final reclamation of oil and gas disturbances are described in Appendix I (Surface Reclamation) of the 1998 Draft Supplemental EIS (DSEIS). Specific measures to follow during interim and temporary (pre-interim) reclamation are described below.
- a. Reclamation Plans. In areas that have low reclamation potential or are especially challenging to restore, reclamation plans will be required prior to APD approval. The plan shall contain the following components: detailed reclamation plans, which include contours and indicate irregular rather than smooth contours as appropriate for visual and ecological benefit; timeline for drilling completion, interim reclamation earthwork, and seeding; soil test results and/or a soil profile description; amendments to be used; soil treatment techniques such as roughening, pocking, and terracing; erosion control techniques such as hydromulch, blankets/matting, and wattles; and visual mitigations if in a sensitive VRM area.
- b. Deadline for Interim Reclamation Earthwork and Seeding. Interim reclamation to reduce a well pad to the maximum size needed for production, including earthwork and seeding of the interim reclaimed areas, shall be completed within 6 months following completion of the last well planned for the pad. Reclamation, including seeding, of temporarily disturbed areas along roads, pipelines, and topsoil piles and berms, shall be completed within 30 days following completion of construction.

If requested by the project lead NRS for a specific pad or group of pads, the operator shall contact the NRS by telephone or email approximately 72 hours before reclamation and reseeding begin. This will allow the NRS to schedule a pre-reclamation field visit if needed to ensure that all parties are in agreement and provide time for adjustments to the plan before work is initiated.

The deadlines for seeding described above are subject to extension upon approval of the BLM based on season, timing limitations, or other constraints on a case-by-case basis. If the BLM approves an extension for seeding, the operator may be required to stabilize the reclaimed surfaces using hydromulch, erosion matting, or other method until seeding is implemented.

- c. Topsoil Stripping, Storage, and Replacement. All topsoil shall be stripped following removal of vegetation during construction of well pads, pipelines, roads, or other surface facilities. In areas of thin soil, a minimum of the upper 6 inches of surficial material shall be stripped. The BLM may specify a stripping depth during the onsite visit or based on subsequent information regarding soil thickness and suitability. The stripped topsoil shall be stored separately from subsoil or other excavated material and replaced prior to final seedbed preparation. The BLM best management practice (BMP) for the Windrowing of Topsoil (COA number 19) shall be implemented for well pad construction whenever topography allows.
- d. Seedbed Preparation. For cut-and-fill slopes, initial seedbed preparation shall consist of backfilling and recontouring to achieve the configuration specified in the reclamation plan. For compacted areas, initial seedbed preparation shall include ripping to a minimum depth of 18 inches, with a maximum furrow spacing of 2 feet. Where practicable, ripping shall be conducted in two passes at perpendicular directions. Following final contouring, the backfilled or ripped surfaces shall be covered evenly with topsoil.

Final seedbed preparation shall consist of scarifying (raking or harrowing) the spread topsoil prior to seeding. If more than one season has elapsed between final seedbed preparation and seeding, and if the area is to be broadcast-seeded or hydroseeded, this step shall be repeated no more than 1 day prior to seeding to break up any crust that has formed.

Seedbed preparation is not required for topsoil storage piles or other areas of temporary seeding.

Requests for use of soil amendments, including basic product information, shall be submitted to the BLM for approval.

- e. Seed Mixes. A seed mix consistent with BLM standards in terms of species and seeding rate for the specific habitat type shall be used on all BLM lands affected by the project (see Attachments 1 and 2 of the letter provided to operators dated May 1, 2008). Note that temporary seeding no longer allows the use of sterile hybrid non-native species.

For private surfaces, the menu-based seed mixes are recommended, but the surface landowner has ultimate authority over the seed mix to be used in reclamation. The seed shall contain no noxious, prohibited, or restricted weed seeds and shall contain no more than 0.5 percent by weight of other weed seeds. Seed may contain up to 2.0 percent of "other crop" seed by weight, including the seed of other agronomic crops and native plants; however, a lower percentage of other crop seed is recommended. Seed tags or other official documentation shall be submitted to BLM at least 14 days before the date of proposed seeding for acceptance. Seed that does not meet the above criteria shall not be applied to public lands.

- f. Seeding Procedures. Seeding shall be conducted no more than 24 hours following completion of final seedbed preparation.

Where practicable, seed shall be installed by drill-seeding to a depth of 0.25 to 0.5 inch. Where drill-seeding is impracticable, seed may be installed by broadcast-seeding at twice the drill-seeding rate, followed by raking or harrowing to provide 0.25 to 0.5 inch of soil cover or by hydroseeding and hydromulching. Hydroseeding and hydromulching shall be conducted in two separate applications to ensure adequate contact of seeds with the soil.

If interim revegetation is unsuccessful, the operator shall implement subsequent reseeding until interim reclamation standards are met.

- g. Mulch. Mulch shall be applied within 24 hours following completion of seeding. Mulch may consist of either hydromulch or of certified weed-free straw or certified weed-free native grass hay crimped into the soil.

NOTE: Mulch is not required in areas where erosion potential mandates use of a biodegradable erosion-control blanket (straw matting).

- h. Erosion Control. Cut-and-fill slopes shall be protected against erosion with the use of water bars, lateral furrows, or other measures approved by the BLM. Cut-and-fill slopes along drainages or in areas with high erosion potential shall also be protected from erosion using hydromulch designed specifically for erosion control or biodegradable blankets/matting, bales, or wattles of weed-free straw or weed-free native grass hay. A well-anchored fabric silt fence shall also be placed at the toe of cut-and-fill slopes along drainages or to protect other sensitive areas from deposition of soils eroded off the slopes. Additional BMPs shall be employed as necessary to reduce soil erosion and offsite transport of sediments.
- i. The pad shall be fenced to BLM standards to exclude livestock grazing for the first two growing seasons or until seeded species are firmly established, whichever comes later. The seeded species will be considered firmly established when at least 50 percent of the new plants are producing seed. The BLM will approve the type of fencing.

- j. Monitoring. The operator shall conduct annual monitoring surveys of all sites categorized as “operator reclamation in progress” and shall submit an annual monitoring report of these sites to the BLM by **December 31** of each year. The monitoring program shall use the four Reclamation Categories defined in Appendix I of the 1998 DSEIS to assess progress toward reclamation objectives. The annual report shall document whether attainment of reclamation objectives appears likely. If one or more objectives appear unlikely to be achieved, the report shall identify appropriate corrective actions. Upon review and approval of the report by the BLM, the operator shall be responsible for implementing the corrective actions or other measures specified by the BLM.
8. Weed Control. The operator shall regularly monitor and promptly control noxious weeds or other undesirable plant species as set forth in the Glenwood Springs Field Office *Noxious and Invasive Weed Management Plan for Oil and Gas Operators*, dated March 2007. A Pesticide Use Proposal (PUP) must be approved by the BLM prior to the use of herbicides. Annual weed monitoring reports shall be submitted to BLM by **December 1**.
9. Big Game Winter Range Timing Limitation. Does not apply to Fee lands.
10. Bald and Golden Eagles. It shall be the responsibility of the operator to comply with the Bald and Golden Eagle Protection Act (Eagle Act) with respect to “take” of either eagle species. Under the Eagle Act, “take” includes to pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest and disturb. “Disturb” means to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, (1) injury to an eagle; (2) a decrease in its productivity by substantially interfering with normal breeding, feeding, or sheltering behavior; or (3) nest abandonment by substantially interfering with normal breeding, feeding, or sheltering behavior. Avoidance of eagle nest sites, particularly during the nesting season, is the primary and preferred method to avoid a take. Any oil or gas construction, drilling, or completion activities planned within 0.5 mile of a bald or golden eagle nest, or other associated activities greater than 0.5 miles from a nest that may disturb eagles, should be coordinated with the BLM project lead and BLM wildlife biologist and the USFWS representative in the BLM Field Office (970-876-9051).
11. Raptor Nesting. Raptor nest surveys for this project in 2010 did not result in location of raptor nest structures within 0.25 mile of a well pad or 0.125 mile of an access road, pipeline, or other surface facility associated with this project. Therefore, a Raptor Nesting Timing Limitation COA is not attached to this EA or to authorizations issued pursuant to this EA. Although BLM considers surveys conducted for a NEPA Environmental Assessment to be valid for 2 years, new nests may be built and occupied between the initial surveys and project implementation. To ensure compliance with the Migratory Bird Treaty Act, the operator should schedule construction or drilling activities to begin outside the raptor nesting season (February 1 to August 15) if practicable. If initiation of construction, drilling, or completion activities during these dates cannot be avoided, the operator is responsible for complying with the Migratory Bird Treaty Act, which prohibits the “take” of birds or active nests (those containing eggs or young), including nest failure caused by noise and human activity.
12. Migratory Birds. It shall be the responsibility of the operator to comply with the Migratory Bird Treaty Act (MBTA) with respect to “take” of migratory bird species. Under the MBTA, “take” means to pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. The operator shall prevent use by migratory birds of any pit containing fluids associated with oil or gas operations, including but not limited to reserve pits, produced water pits, frac-water pits, cuttings trenches (if covered by water/fluid), and evaporation pits. Fluids in these

pits may pose a risk to migratory birds (e.g., waterfowl, shorebirds, wading birds, songbirds, and raptors) as a result of ingestion, absorption through the skin, or interference with buoyancy and temperature regulation. Regardless of the method used, it shall be in place within 24 hours following the placement of fluids into a pit. Because of high toxicity to birds, oil slicks and oil sheens should immediately be skimmed off the surface of any pit that is not netted. The most effective way to eliminate risk to migratory birds is prompt drainage, closure, and reclamation of pits, which is strongly encouraged. All mortality or injury to species protected by the MBTA shall be reported immediately to the BLM project lead and to the USFWS representative in the BLM Field Office at 970-876-9051 and visit <http://www.fws.gov/mountain-prairie/contaminants/oilpits.htm>.

13. Birds of Conservation Concern. Pursuant to BLM Instruction Memorandum 2008-050, all surface-disturbing activities are prohibited from May 1 to July 1 to reduce impacts to Birds of Conservation Concern (BCC). An exception to this COA will be granted if nesting surveys conducted during the nesting season dates listed above indicate that no BCC species are nesting within 10 meters of the area to be disturbed. The presence of a singing male shall be deemed to constitute nesting. Nesting surveys shall include an aural survey for diagnostic vocalizations in conjunction with a visual survey for adults and nests. Surveys shall be conducted by a qualified breeding bird surveyor between sunrise and 10:00 AM under favorable conditions for detecting and identifying a BCC species. This provision does not apply to ongoing construction, drilling, or completion activities that are initiated prior to May 1 and continue into the 60-day period at the same location.
14. Range Management. Range improvements (fences, gates, reservoirs, pipelines, etc) shall be avoided during development of natural gas resources to the maximum extent possible. If range improvements are damaged during exploration and development, the operator will be responsible for repairing or replacing the damaged range improvements. If a new or improved access road bisects an existing livestock fence, steel frame gate(s) or a cattle guard with associated bypass gate shall be installed across the roadway to control grazing livestock.
15. Ips Beetle. To avoid mortality of pinyon pines due to infestations of the *Ips* beetle, any pinyon trees damaged during road, pad, or pipeline construction shall be chipped after being severed from the stump or grubbed from the ground, buried in the toe of fill slopes (if feasible), or cut and removed from the site within 24 hours to a location approved by the Colorado State Forest Service.
16. Paleontological Resources. All persons associated with operations under this authorization shall be informed that any objects or sites of paleontological or scientific value, such as vertebrate or scientifically important invertebrate fossils, shall not be damaged, destroyed, removed, moved, or disturbed. If in connection with operations under this authorization any of the above resources are encountered the operator shall immediately suspend all activities in the immediate vicinity of the discovery that might further disturb such materials and notify the BLM of the findings. The discovery must be protected until notified to proceed by the BLM.

Where feasible, the operator shall suspend ground-disturbing activities at the discovery site and immediately notify the BLM of any finds. The BLM will, as soon as feasible, have a BLM-permitted paleontologist check out the find and record and collect it if warranted. If ground-disturbing activities cannot be immediately suspended, the operator shall work around or set the discovery aside in a safe place to be accessed by the BLM-permitted paleontologist.

17. Cultural Education/Discovery. All persons in the area who are associated with this project shall be informed that if anyone is found disturbing historic, archaeological, or scientific resources, including collecting artifacts, the person or persons will be subject to prosecution.

Pursuant to 43 CFR 10.4(g), the BLM shall be notified by telephone, with written confirmation, immediately upon the discovery of human remains, funerary items, sacred objects, or objects of cultural patrimony. Further, pursuant to 43 CFR 10.4 (c) and (d), activities shall stop in the vicinity of the discovery, and the discovery shall be protected for 30 days or until notified by the BLM to proceed.

If in connection with operations under this contract, the operator, its contractors, their subcontractors, or the employees of any of them discovers, encounters, or becomes aware of any objects or sites of cultural value or scientific interest such as historic ruins or prehistoric ruins, graves or grave markers, fossils, or artifacts, the operator shall immediately suspend all operations in the vicinity of the cultural resource and shall notify the BLM of the findings (16 USC 470h-3, 36 CFR 800.112). Operations may resume at the discovery site upon receipt of written instructions and authorization by the BLM. Approval to proceed will be based upon evaluation of the resource. Evaluation shall be by a qualified professional selected by the BLM from a Federal agency insofar as practicable. When not practicable, the operator shall bear the cost of the services of a non-Federal professional.

Within five working days, the BLM will inform the operator as to:

- whether the materials appear eligible for the National Register of Historic Places
- what mitigation measures the holder will likely have to undertake before the site can be used (assuming that *in-situ* preservation is not necessary)
- the timeframe for the BLM to complete an expedited review under 36 CFR 800.11, or any agreements in lieu thereof, to confirm through the SHPO State Historic Preservation Officer that the findings of the BLM are correct and that mitigation is appropriate

The operator may relocate activities to avoid the expense of mitigation and delays associated with this process, as long as the new area has been appropriately cleared of resources and the exposed materials are recorded and stabilized. Otherwise, the operator shall be responsible for mitigation costs. The BLM will provide technical and procedural guidelines for relocation and/or to conduct mitigation. Upon verification from the BLM that the required mitigation has been completed, the operator will be allowed to resume construction.

Antiquities, historic ruins, prehistoric ruins, and other cultural or paleontological objects of scientific interest that are outside the authorization boundaries but potentially affected, either directly or indirectly, by the Proposed Action shall also be included in this evaluation or mitigation. Impacts that occur to such resources as a result of the authorized activities shall be mitigated at the operator's cost, including the cost of consultation with Native American groups.

Any person who, without a permit, injures, destroys, excavates, appropriates or removes any historic or prehistoric ruin, artifact, object of antiquity, Native American remains, Native American cultural item, or archaeological resources on public lands is subject to arrest and penalty of law (16 USC 433, 16 USC 470, 18 USC 641, 18 USC 1170, and 18 USC 1361).

18. Visual Resources. All applications for permit to drill (APDs) shall include a detailed, site-specific description outlining how the Proposed Action will meet the VRM Class of the area where the action is proposed. The specific location of the Proposed Action, including pads, roads, and pipelines, shall be shown on a map and shall include associated cut-and-fill data (location, horizontal and vertical extent, slope length, and steepness).

To the extent practicable, existing vegetation shall be preserved when clearing and grading for pads, roads, and pipelines. The BLM may direct that cleared trees and rocks be salvaged and redistributed over reshaped cut-and-fill slopes or along linear features.

Above-ground facilities shall be painted a natural color selected to minimize contrast with adjacent vegetation or rock outcrops. The color shall be specified by the BLM and attached as a COA to individual APDs.

19. Windrowing of Topsoil. Topsoil shall be windrowed around the pad perimeter to create a berm that limits and redirects stormwater runoff and extends the viability of the topsoil per BLM Topsoil Best Management Practices (BLM 2009 PowerPoint presentation available upon request from Glenwood Springs Field Office). Topsoil shall also be windrowed, segregated, and stored along pipelines and roads for later spreading across the disturbed corridor during final reclamation. Topsoil berms shall be promptly seeded to maintain soil microbial activity, reduce erosion, and minimize weed establishment.
20. Reserve Pit. A minimum of 2 feet of freeboard shall be maintained in the reserve pit. Freeboard is measured from the highest level of drilling fluids and cuttings in the reserve pit to the lowest surface elevation of ground at the reserve pit perimeter.
21. Soils. Cuts and fills shall be minimized when working on erosive soils and slopes in excess of 30 percent. Cut-and-fill slopes shall be stabilized through revegetation practices with an approved seed mix shortly following construction activities to minimize the potential for slope failures and excessive erosion. Fill slopes adjacent to drainages shall be protected with well-anchored silt fences, straw wattles, or other acceptable BMPs designed to minimize the potential for sediment transport. On slopes greater than 50 percent, BLM personnel may request a professional geotechnical analysis prior to construction.

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APPENDIX B
Downhole Conditions of Approval

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DOWNHOLE CONDITIONS OF APPROVAL
Applications for Permit to Drill

Company/Operator: Bill Barrett Corporation

Surface Location: Lot 2, Section 6, Township 7 South, Range 91 West, 6th P.M. and
SWSE Section 31, Township 6 South, Range 91 West, 6th P.M.

<u>Well Name</u>	<u>Well No.</u>	<u>Bottomhole Location</u>	<u>Lease</u>
Miller Fed	23B-6(Miller#10)	NESW, Sec 32, T6S, R91W	COC66576
Miller Fed	23C-6(Miller#10)	NESW, Sec 32, T6S, R91W	COC66576
Miller Fed	23D-6(Miller#10)	NESW, Sec 32, T6S, R91W	COC66576
Miller Fed	24A-31(Miller#10)	SESW, Sec 32, T6S, R91W	COC66576
Miller Fed	24B-31(Miller#10)	SESW, Sec 32, T6S, R91W	COC66576
Miller Fed	24C-31(Miller#10)	SESW, Sec 32, T6S, R91W	COC66576
Miller Fed	24D-31(Miller#10)	NWSE, Sec 32, T6S, R91W	COC66576

1. Twenty-four hours *prior* to (a) spudding, (b) conducting BOPE tests, (c) running casing strings, and (d) within twenty-four hours *after* spudding, the CRVFO shall be notified. One of the following CRVFO inspectors shall be notified by phone: Steve Ficklin at 970-876-9036, 970-319-2509 (c), David Giboo shall at 970-876-9038, 970-319-2211 (c), and Todd Sieber at 970-876-9044, 970-319-7887 (c).
2. A CRVFO petroleum engineer shall be contacted for a verbal approval prior to commencing remedial work, plugging operations on newly drilled boreholes, changes within the drilling plan, sidetracks, changes or variances to the BOPE, deviating from conditions of approval, and conducting other operations not specified within the APD. Contact, Will Howell at 970-876-9049 (office) or 970-319-5837 for verbal approvals. As a secondary contact, call Dane Geyer at 970-876-9048 (office) or 970-589-6887 (cell) for verbal approvals.
3. If a well control issue arises during drilling or completions operations (e.g. kick, blowout, water flow, casing failure occurs, or an increase in bradenhead pressure) occurs during drilling/fracturing operations, Will Howell 970-876-9049 shall be notified within 24 hours from the time of the event. IADC, Driller's Logs, and Pason Logs (mud logs) will be forwarded to CRVFO, Will Howell/Dane Geyer, 2300 River Frontage Road, Silt, Colorado 81652 within 24 hours of a well control event.
4. The BOPE shall be tested and conform to Onshore Order #2 for a **3M** system.
5. A casinghead rated to 3,000 psi or greater shall be utilized.
6. An electrical/mechanical mud monitoring equipment shall be function tested prior to drilling out the surface casing shoe. As a minimum, this equipment shall include a trip tank, pit volume totalizer, stroke counter, and flow sensor.
7. Prior to drilling out the surface casing shoe, gas detecting equipment shall be installed in the mud return system, and the rate of penetration/mud shall be monitored for hydrocarbon gas/pore pressure changes.
8. A gas buster shall be functional and all flare lines effectively anchored in place, prior to drilling out the surface casing shoe. The discharge of the flare lines shall be a minimum of 100 feet from the

- wellhead and targeted at bends. The panic line shall be a separate line (not open inside the buffer tank) and effectively anchored. All lines shall be downwind of the prevailing wind direction and directed into a flare pit, which cannot be the reserve pit. The flare system shall use an automatic ignition. Where noncombustible gas is likely or expected to be vented, the system shall be provided supplemental fuel for ignition and maintain a continuous flare.
9. 800 feet of Surface Casing will be required on these wells to protect potential water source/aquifers.
 10. After the surface casing is cemented, a Pressure Integrity Test/FIT will be performed on the first well drilled in accordance with OOGO No. 2; Sec. III, B.1. i. in order to make sure the surface casing is set in a competent formation. Submit the results from the test via email (william_howell@blm.gov) on the first well drilled on the pad and record results in the IADC log.
 11. Prior to commencing fracturing operations, the production casing shall be tested to the maximum anticipated surface fracture pressure (BBC-6500psi) and held for 15 minutes. If leak-off is found, Will Howell shall be notified within 24 hours of the failed test, but prior to proceeding with fracturing operations. The test shall be charted and set to a time increment as to take up no less than a quarter of the chart per test. The chart shall be submitted with the well completion report.
 12. As a minimum, cement shall be brought to 200 feet above the Mesaverde. After WOC for the production casing, a CBL/Temperature Log shall be run (from TD to 200 feet above the TOC) and an electronic copy submitted to: CRVFO, Will Howell/Dane Geyer, 2300 River Frontage Road, Silt, Colorado 81652. If the TOC is lower than required or the cement sheath of poor quality, then within 48 hours from running the CBL and prior to commencing fracturing operations, a CRVFO petroleum engineer shall be notified for further instruction.
- A greater volume of cement may be required to meet the 200-foot cement coverage requirement for the Williams Fork Fm./Mesaverde Group. Please evaluate the top of cement on the first cement job on the pad. If cement is below 200 foot cement coverage requirement, adjust cement volume to compensate for low cement coverage.
13. On the first well drilled on this pad, a triple combo open hole log shall be run from the base of the surface borehole to surface, and from TD to bottom of surface casing shoe. This log shall be in accordance with 43 CFR 3162.4(b), which states that the operator shall submit a complete set of electrical/mechanical logs in .pdf/.las format with standard Form 3160-4, Well Completion or Recompletion Report and LOG. Contact Karen Conrath at 970-876-9053 or karen_conrath@blm.gov for clarification.
 14. Submit the (a) mud/drilling log (e.g. Pason disc), (b) driller's event log/operations summary report, (c) production test volumes, (d) directional survey, and (e) Pressure Integrity Test results with the well completion report. Contact Will Howell for clarification.
 15. Air drilling will require the use of a rotary head. The variance for a diverter is denied. The use of air drilling should conform to Onshore Order No. 2. Blooie Line discharge will be 100 feet from well bore.