

**U.S. Department of the Interior
Bureau of Land Management
Glenwood Springs Energy Office
2425 S. Grand Avenue, Suite 101
Glenwood Springs, CO 81601**

ENVIRONMENTAL ASSESSMENT

NUMBER: CO140-2008-027 EA

CASEFILE NUMBER: Federal Lease COC 01524, Communitization Agreement CA 071238

PROJECT NAME: Proposal to Drill 8 Federal Wells and 2 Private Wells from Proposed PH16 Pad and 6 Federal Wells and 1 Private Well from Proposed PI16 Pad located east of Battlement Mesa along Garfield County Road 302.

LOCATION: NE $\frac{1}{4}$ NE $\frac{1}{4}$, SE $\frac{1}{4}$ NE $\frac{1}{4}$, NE $\frac{1}{4}$ SE $\frac{1}{4}$, Section 16, Township 7 South, Range 95 West, 6th Principal Meridian.

LEGAL DESCRIPTIONS:

Table 1. Surface and Bottomhole Locations of the Proposed Wells.		
<i>Proposed Wells (Proposed Pad)</i>	<i>Surface Locations (Sec. 16, T.7 S., R.95W.)</i>	<i>Bottomhole Locations (T.7 S., R.95W.)</i>
Federal 15-4 (PH16)	1331 feet FNL, 226 feet FEL, NE $\frac{1}{4}$ NE $\frac{1}{4}$	860 feet FNL, 660 feet FWL NW $\frac{1}{4}$ NW $\frac{1}{4}$, Section 15
Federal 15-4BB (PH16)	1311 feet FNL, 226 feet FEL, NE $\frac{1}{4}$ NE $\frac{1}{4}$	250 feet FNL, 660 feet FWL NW $\frac{1}{4}$ NW $\frac{1}{4}$, Section 15
Federal 15-5 (PH16)	1371 feet FNL, 226 feet FEL, NE $\frac{1}{4}$ NE $\frac{1}{4}$	2180 feet FNL, 660 feet FWL SW $\frac{1}{4}$ NW $\frac{1}{4}$, Section 15
Federal 15-5BB (PH16)	1351 feet FNL, 226 feet FEL, NE $\frac{1}{4}$ NE $\frac{1}{4}$	1575 feet FNL, 660 feet FWL SW $\frac{1}{4}$ NW $\frac{1}{4}$, Section 15
Federal 16-1 (PH16)	1291 feet FNL, 226 feet FEL, NE $\frac{1}{4}$ NE $\frac{1}{4}$	490 feet FNL, 660 feet FWL NE $\frac{1}{4}$ NE $\frac{1}{4}$, Section 16
Federal 16-1BB (PH16)	1321 feet FNL, 234 feet FEL, NE $\frac{1}{4}$ NE $\frac{1}{4}$	1150 feet FNL, 660 feet FWL NE $\frac{1}{4}$ NE $\frac{1}{4}$, Section 16
Federal 16-8 (PH16)	1381 feet FNL, 234 feet FEL, NE $\frac{1}{4}$ NE $\frac{1}{4}$	1810 feet FNL, 660 feet FWL SE $\frac{1}{4}$ NE $\frac{1}{4}$, Section 16
Federal 16-8BB (PH16)	1391 feet FNL, 234 feet FEL, SE $\frac{1}{4}$ NE $\frac{1}{4}$	2470 feet FNL, 660 feet FWL SE $\frac{1}{4}$ NE $\frac{1}{4}$, Section 16
Fed. Bosley 16-2 (PH16) Sundry Authorization	1361 feet FNL, 234 feet FEL, SE $\frac{1}{4}$ NE $\frac{1}{4}$	860 feet FNL, 1980 feet FWL NW $\frac{1}{4}$ NE $\frac{1}{4}$, Section 16
Fed. Bosley 16-2BB (PH16) Sundry Authorization	1301 feet FNL, 234 feet FEL, NE $\frac{1}{4}$ NE $\frac{1}{4}$	250 feet FNL, 1980 feet FWL NW $\frac{1}{4}$ NE $\frac{1}{4}$, Section 16
Federal 15-12 (PI16)	2348 feet FNL, 730 feet FEL, NE $\frac{1}{4}$ SE $\frac{1}{4}$	1780 feet FNL, 660 feet FWL NW $\frac{1}{4}$ SW $\frac{1}{4}$, Section 15
Federal 15-12BB (PI16)	2357 feet FNL, 711 feet FEL, NE $\frac{1}{4}$ SE $\frac{1}{4}$	2440 feet FNL, 660 feet FWL NW $\frac{1}{4}$ SW $\frac{1}{4}$, Section 15
Fed. Hagen 15-13BB (PI16) R/W authorization	2340 feet FNL, 749 feet FEL, NE $\frac{1}{4}$ SE $\frac{1}{4}$	1079 feet FNL, 660 feet FWL SW $\frac{1}{4}$ SW $\frac{1}{4}$, Section 15
Federal 16-9 (PI16)	2332 feet FNL, 768 feet FEL, NE $\frac{1}{4}$ SE $\frac{1}{4}$	2150 feet FNL, 660 feet FWL NE $\frac{1}{4}$ SE $\frac{1}{4}$, Section 16

Table 1 con't. Surface and Bottomhole Locations of the Proposed Wells.		
<i>Proposed Wells (Proposed Pad)</i>	<i>Surface Locations (Sec. 16, T.7 S., R.95W.)</i>	<i>Bottomhole Locations (T.7 S., R.95W.)</i>
Federal 16-9BB (PI16)	2324 feet FNL, 787 feet FEL, NE¼SE¼	1500 feet FNL, 660 feet FWL NE¼SE¼, Section 16
Federal 16-16 (PI16)	2315 feet FNL, 806 feet FEL, NE¼SE¼	850 feet FNL, 660 feet FWL SE¼SE¼, Section 16
Federal 16-16BB (PI16)	2307 feet FNL, 825 feet FEL NE¼SE¼	250 feet FNL, 660 feet FWL SE¼SE¼, Section 16

APPLICANT: EnCana Oil & Gas (USA) Inc. (“EnCana”)

DESCRIPTION OF THE PROPOSED ACTION AND NO ACTION ALTERNATIVE

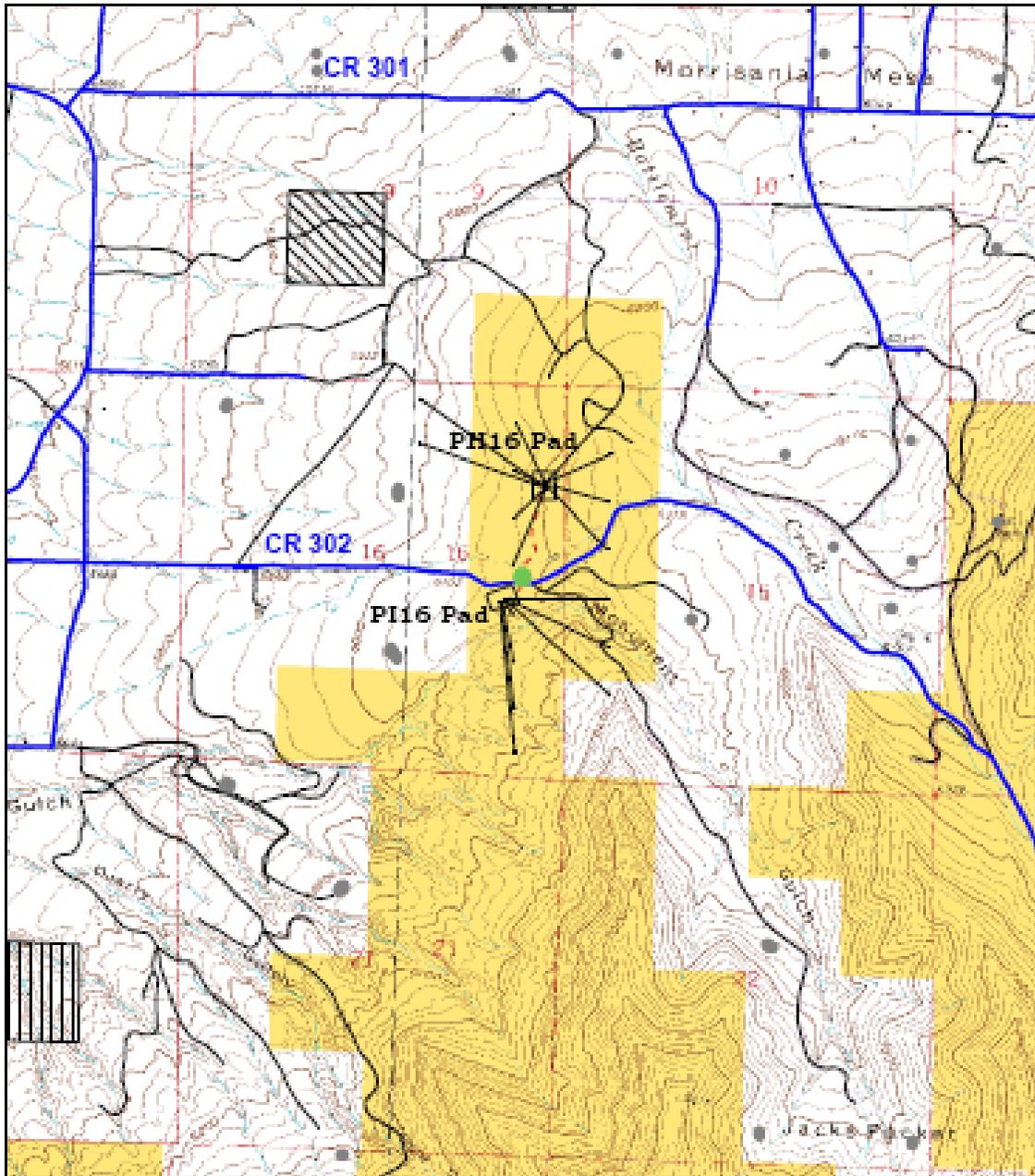
Proposed Action: The proposed action is to drill 14 Federal wells and three private wells from two proposed pads (PH16 and PI16) on Federal surface (Figure 1). The two private wells (Federal Bosley 16-2 and 16-2BB) proposed for the PH16 pad would be drilled into private minerals under a communitization agreement (CA071238). These wells could be approved under a Sundry Notice submittal by the operator. Development of the private well (Federal Hagen 15-13BB) proposed for the PI16 pad is not included in the CA and a right-of-way authorization from the BLM to secure legal access is proposed. The remaining 14 wells would be drilled into Federal mineral estate within the Federal Lease COC 01524.

The project area lies 4 miles southeast of Parachute, Colorado (I-70 exit) and about 1 mile east of the community of Battlement Mesa. The project area is presently accessed by County Road 302 (CR302) which passes near both proposed pad sites. Both proposed pads would be situated within the area burned during the 1987 Battlement Mesa wildfire. Currently, the area is vegetated with various wheatgrasses, rubber rabbitbrush, 4-wing saltbush and an understory of cheatgrass.

The PH16 pad would have a maximum cut of 19.0 feet at the northeast corner and a maximum fill of 23.3 feet at the northwest pad corner. Construction of the well pad would result in approximately 5.7 acres of new surface disturbance, which would be reduced to approximately 2 acres after successful interim reclamation. The PI16 pad would have a maximum cut of 26.2 feet at the southeast corner and a maximum fill of 19.6 feet at the northwest corner. Construction of the pad would result in approximately 3.4 acres of new surface disturbance, which would be reduced to approximately 2 acres after interim reclamation.

To accommodate access to the pads, two new spur roads are also proposed. The roads, which would be 1,100 feet (PH16) and 150 feet (PI16) in length respectively, would have a finished surface width of 18 feet. To limit public access to the PH16 pad, a steel frame traffic control gate would be installed across the PH16 spur road about 300 feet north of CR302. In addition, an existing parking area along CR302 at the junction of the proposed spur roads would be improved. As proposed, the improvements would include ditching and placement of a culvert under the PH16 road spur, the placement of large boulders around the perimeter of the parking area, and graveling to accommodate all-weather use.

A gathering line, 1,250 feet in length, would connect with EnCana’s recently upgraded South Parachute 16-inch trunk pipeline just south of the PI16 pad. The line, which would be routed along the proposed spur roads, would serve wells on both pads. The projected short-term disturbance area for the road and pipelines would be approximately 2.2 acres.



Proposed PH16 Pad (10 wells) & PI16 Pad (7 wells)

(PH16) T7S R95W Sec 16, NE¼NE¼ 6th P.M.

(PI16) T7S R95W Sec 16, NE¼SE¼ 6th P.M.

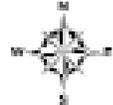
Garfield County, CO

Surface Owner: BLM

Proposed Pad: Black Outlined Block

Proposed Road: Red Dash Line

Improved Parking Area: Green Dot



Scale 1: 24,000

12/27/07

Figure 1. Location of the Proposed Action.

Total short-term surface disturbance associated with the proposed action—including roads, pipelines, and well pads—would be 11.3 acres. The long-term disturbance area for pads and roads would amount to about 4.7 acres.

The pads, road spurs and pipeline would be constructed to standards described in *Surface Operating Standards for Oil and Gas Exploration & Development* (USDI and USDA 2006).

The proposed action would include well drilling and completion operations, installation of production facilities, production of natural gas, and interim and final reclamation measures. The Application for Permit to Drill (APD) for each new well includes a drilling program and a multi-point surface use and operations plan that describe details of well pad construction and interim reclamation. The proposed action would be implemented consistent with the terms of Federal Lease COC 01524, and with Conditions of Approval (COAs) attached to the APDs (Appendices A, B, and C).

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 leases. Although BLM cannot deny the right to drill and develop the leasehold, individual APDs can be denied to prevent unnecessary and undue degradation. The no action alternative constitutes denial of the APDs associated with the proposed action.

Under the no action alternative, therefore, none of the proposed developments described in the proposed action would take place.

PURPOSE AND NEED FOR THE ACTION: The purpose of the action is to develop oil and gas resources on Federal Lease COC 01524 consistent with existing Federal lease rights. The action is needed to increase the development of oil and gas resources for commercial marketing to the public.

SUMMARY OF LEASE STIPULATIONS: No special stipulations are listed on the lease. However, the BLM can enforce Conditions of Approval (COAs) on individual APDs to protect important resource values.

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: Glenwood Springs Resource Management Plan (BLM 1984).

Date Approved: Amended in November 1991 – Oil and Gas Leasing and Development – Final Supplemental Environmental Impact Statement; amended in March 1999 – Oil and Gas Leasing & Development Final Supplemental Environmental Impact Statement.

Decision Number/Page: Record of Decision, Glenwood Springs Resource Management Plan Amendment, November 1991, page 3.

Decision Language: “697,720 acres of BLM-administrated mineral estate within the Glenwood Springs Field Office area are open to oil and gas leasing and development, subject to lease terms and (as applicable) lease stipulations.” This decision was carried forward unchanged in the 1999 RMP amendment (BLM 1999).

Discussion: The proposed action is in conformance with the 1991 and 1999 Oil and Gas RMP amendments because the Federal mineral estate proposed for development is open for oil and gas leasing and development.

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 the proposed action or alternatives being analyzed would result in impacts that would maintain, improve, or deteriorate land health conditions relative to these resources.

These analyses are conducted in relation to baseline conditions described in land health assessments (LHAs) completed by the BLM. The proposed action would be located in an area that was included in the Battlement Mesa LHA (BLM 2000).

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, may not be affected by the proposed action and alternative (Table 2). Only those mandatory critical elements that are present and affected are described in the following narrative.

In addition to the mandatory critical elements, there are additional resources that would be impacted by the proposed action and alternative. These are presented under **Other Affected Resources.**

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
ACECs		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/ WSAs		X		X
Native American Religious Concerns		X		X					

* Public Land Health Standard

Critical Elements

Air Quality

Affected Environment: The proposed action area (Garfield County) has been described as an attainment area under CAAQS and NAAQS (Colorado Ambient Air Quality Standards and National Ambient Air

Quality Standards). An attainment area is an area where ambient air pollution amounts are determined to be below NAAQS standards.

Proposed Action:

Environmental Consequences: The Roan Plateau RMPA and EIS describe potential effects from oil and gas development (BLM 2006:4-26 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 and EIS. Findings indicate that no adverse long-term effects would result under that plan. Since the proposed action is within the scope of the reasonable foreseeable development (RFD) scenario analyzed in that document, it is anticipated that the proposed action would be unlikely to have adverse effects on air quality.

Activities described in the proposed action would result in localized increases in vehicle and equipment emissions that would last the life of the drilling and completion activities. Concentrations of emissions would be below applicable ambient air quality standards as analyzed in the Roan Plateau RMPA & EIS. However, it is anticipated that construction and production activities would likely produce high levels of dust in dry conditions without dust abatement. To mitigate dust generated by these activities, the operator would be required to implement dust abatement strategies as needed by watering the access road and construction areas and/or by applying a surfactant approved by the Authorized Officer (Appendix A, Number 2).

No Action Alternative:

Environmental Consequences: The no action alternative would have no impact on air quality.

Cultural Resources

Affected Environment: Three Class III inventories (GSFO#14606-3, 1106-18 and 1196) have been conducted within the Area of Potential Effect (APE). Two historic properties, the Dobey and the Huntley irrigation ditches, were identified. The Dobey Ditch runs perpendicular to the proposed PH16 access road and the Huntley Ditch, is adjacent and runs parallel to the PI16 pad location. Both of these sites are considered eligible for listing on the National Register of Historic Places (NRHP).

Proposed Action:

Environmental Consequences: The proposed action could adversely impact the historic properties as currently planned. Consultation to mitigate a nearby segment of the Huntley Ditch was undertaken on August 7, 2006 with the Colorado State Historic Preservation Officer (SHPO) related to EnCana's 16-inch South Parachute pipeline extension project. On August 14, 2006 the SHPO concurred with the BLM's proposed mitigation measures. The same measures, which would be included as

Site-Specific Conditions of Approval (COAs), would be required to mitigate the potential long-term impacts of the pipeline and road crossings (Appendix B). These measures include monitoring photos (pre- and post-construction), installation of buried pipelines prior to road construction and culvert installations, a restricted work corridor (30-feet in width) at the ditch crossings, and installation of flumes to direct live flows in ditches through the work area. EnCana must comply with these measures before a determination of "No Affect" can be made in accordance with the National Historic Preservation Act (16U.S.C 470f), National BLM/SHPO Programmatic Agreement (1997), and Colorado Protocol (1998).

Indirect long-term cumulative impacts from increased access and the presence of project personnel could result in a range of impacts to known and undiscovered cultural resources in the vicinity of the location. These impacts could range from illegal collection and excavation to vandalism.

A standard Education/Discovery (COA) for cultural resource protection would be attached to the APD(s) (Appendix A, Number 3). The importance of this COA should be stressed to operator and its contractors, including informing them of their responsibilities to protect and report any cultural resources encountered during drilling and development operations. The proponent and subcontractors should also be aware of requirements under the Colorado Statutes for Human Burials (CRS 24-80-1301, CRS 24-80-1302, and CRS 24-80-405).

No Action Alternative:

Environmental Consequences: Under this alternative, there would be no impacts to known historic properties.

Invasive, Non-native Species

Affected Environment: The project area was historically a pinyon-juniper (*Pinus edulis-Juniperus osteosperma*) woodland before it burned in the 1987 Battlement Mesa fire. After the fire, the BLM reseeded the area with native species such as wheatgrasses and scarlet globemallow (*Sphaeralcea coccinea*), and non-native species such as alfalfa (*Medicago sativa*), smooth brome (*Bromus inermis*), and orchardgrass (*Dactylis glomerata*). Native species that regenerated after the fire include rubber rabbitbrush (*Chrysothamnus nauseosus*) and fourwing saltbush (*Atriplex canescens*). Russian knapweed (*Acroptilon repens*), a List B noxious weed, is found in southwest corner of proposed PI16 pad. Cheatgrass (*Anisantha tectorum*), a List C noxious weed, is present throughout the area, but is not dense. Common mullein (*Verbascum thapsus*), a List C noxious weed, is scattered throughout the proposed project area.

Proposed Action:

Environmental Consequences: 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 a variety of invasive non-native species are already 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, Numbers 4 and 5)

No Action Alternative

Environmental Consequences: Under the no action alternative, no new construction would take place; therefore, no new infestations of invasive non-native species should occur. However, existing infestations are likely to spread if not treated.

Migratory Birds

Affected Environment: The 1987 Battlement Mesa fire consumed pinyon-juniper woodlands in the proposed project area. The area was subsequently reseeded with native species such as wheatgrasses and globemallow, and non-native species such as alfalfa, smooth brome, and orchardgrass. Shrubs such as

rubber rabbitbrush and fourwing saltbush as well as native forbs like golden and tansy-aster regenerated naturally. Cottonwoods with sufficient size and structure for nesting raptors are found along a perennial drainage bisecting the project area and along Monument Gulch, directly south of the PI16 pad location. Pinyon-juniper woodlands are found approximately 200 meters northeast of the PH16 pad location.

Given the habitat conditions, a low diversity and density of migratory species are expected to occur in the area. One species, the burrowing owl (*Athene cunicularia*), is included on the U. S. Fish and Wildlife Service's Birds of Conservation Concern (BCC) list for this region (USFWS 2002). Four other species on the list may use pinyon-juniper woodlands found nearby. These species include the pinyon jay (*Gymnorhinus cyanocephalus*), gray vireo (*Vireo vicinior*), black-throated gray warbler (*Dendroica nigrescens*), and Virginia's warbler (*Vermivora virginiae*).

There were no raptor nest structures observed during surveys conducted in suitable habitat within 0.25 mile of the proposed developments. However, open, non-forested vegetative conditions found in the area provide important foraging habitat for three species on the BCC list. They include the golden eagle (*Aquila chrysaetos*), ferruginous hawk (*Buteo regalis*), and prairie falcon (*Falco mexicanus*). Non-BCC listed raptors potentially using the riparian woodland habitats for nesting 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 the raptors and other species listed above are protected by the Migratory Bird Treaty Act.

Proposed Action:

Environmental Consequences: Construction of new spur roads, pipelines and pads would result in approximately 11.3 acres of new surface disturbance. If surface disturbance occurs during the nesting period of April 15 to August 1, direct take or destruction of active nests could occur. Once drilling is completed, desirable herbaceous vegetation on the unused portions of pads, roads, and pipelines could be restored within 2 to 3 years under favorable conditions, thereby reducing long-term habitat loss to 4.7 acres. The establishment of mature shrubs could take from 5 to 25 years, and the establishment of mature trees could take one hundred years or more.

Indirectly, habitat effectiveness adjacent to well pads would be reduced as a result of noise and human activity during construction, drilling, and completion activities. The effect of noise varies among bird species, but is measurable in areas exposed to relatively moderate levels of noise (LaGory 2001). Noise can mask vocalizations important for mate attraction, social cohesion, predator avoidance, prey detection, navigation, and other basic behaviors. The acoustic interference can potentially result in the reduced ability of individuals to acquire mates, reproduce, raise young, and avoid predation (West 2006). Effects from disturbance associated with drilling and completion activities on the two well pads could be expected whenever these activities occur during the nesting season. During the production and maintenance phase, individual birds may avoid areas disturbed by vehicles servicing wells but because visits are generally infrequent, temporary, and produce significantly less noise, impacts would be negligible.

The development of reserve pits in the project area may be expected to attract waterfowl and other migratory birds for purposes of resting, foraging, or as a source of free water. The extent and nature of the problem is not well-defined, but management measures should focus on preventing bird contact with produced water and drilling and completion fluids that may pose a problem (e.g., acute or chronic toxicity, compromised insulation). Mitigation measures designed to limit access to reserve pits are presented Appendix A (Number 6).

Raptors are not expected to be negatively affected as no known nests are located within 0.25 mile of proposed developments and upland foraging habitat is plentiful in the area. A raptor nesting Condition of Approval would be attached to well permits (Appendix A, Number 7).

No Action Alternative:

Environmental Consequences: The no action alternative would not result in new surface disturbance or increased human activity and would have no effect on migratory bird populations.

Native American Religious Concerns

Affected Environment: The Ute tribes claim this area as part of their ancestral homeland. At present, no Native American concerns are known within the project area and none were identified during the inventories. The Ute Tribe of the Uintah and Ouray Bands, the primary Native American tribe in this area of the GSFO, have indicated that they do not need to be consulted for small projects or projects where no Native American areas of concern have been identified either through survey or past consultations. Therefore, formal consultation was not undertaken. If new data are disclosed, new terms and conditions may have to be negotiated to accommodate their concerns.

Proposed Action:

Environmental Consequences: Although there would be no direct impacts from the proposed action, indirect impacts from increased access and personnel in the vicinity of the proposed project could result in impacts to unknown Native American resources ranging from illegal collection to vandalism.

A standard Education/Discovery (COA) for the protection of Native American values would be attached to the APD(s) (Appendix A, Number 3). The importance of this COA should be stressed to operator and its contractors, including informing them of their responsibilities to protect and report any cultural resources encountered during drilling and development operations. The proponent and subcontractors should also be aware of requirements under the Native American Graves Protection and Repatriation Act (NAGPRA) (Appendix A, Number 8) and the Colorado Statutes for Human Burials (CRS 24-80-1301, CRS 24-80-1302, and CRS 24-80-405).

No Action Alternative:

Environmental Consequences: Under this alternative there would be no impacts to known and undiscovered areas of Native American concern.

Special Status Species (includes an analysis of Public Land Health Standard 4)

Affected Environment:

Federally Listed, Proposed, or Candidate Plant and Animal Species

According to the current species list available online from the U. S. Fish and Wildlife Service (USFWS) (<http://mountain-prairie.fws.gov/endspp/CountyLists/COLORADO.htm>), the following Federally listed, proposed, or candidate plant and animal species may occur within or be impacted by actions occurring in Garfield County: Uinta Basin hookless cactus (*Sclerocactus glaucus*), Parachute beardtongue (*Penstemon debilis*), DeBeque phacelia (*Phacelia submutica*), Canada lynx (*Lynx canadensis*), Mexican spotted owl (*Strix occidentalis*), yellow-billed cuckoo (*Coccyzus americanus*), razorback sucker (*Xyrauchen texanus*), Colorado pikeminnow (*Ptychocheilus lucius*), bonytail chub (*Gila elegans*), and humpback chub (*Gila*

cypha). The bald eagle (*Haliaeetus leucocephalus*) was removed from the listed of threatened or endangered species in August 2007. The BLM now considers the bald eagle a sensitive species.

Of the Federally listed, proposed, or candidate animal species mentioned above, no suitable habitat is present at or near the project area for Canada lynx, Mexican spotted owl or yellow-billed cuckoo. Therefore, these species are not considered further. However, the Colorado River and its 100-year floodplain are found within 3 miles of the project and contains suitable habitat for the four endangered big-river fishes, and Designated Critical Habitat occurs in the immediate vicinity for two of these species, the Colorado pikeminnow and razorback sucker.

BLM Sensitive Plant and Animal Species

BLM sensitive plant and animal species with habitat and/or occurrence records in the area include adobe thistle (*Cirsium perplexans*), DeBeque milkvetch (*Astragalus debequaeus*), Naturita milkvetch (*Astragalus naturitensis*), Roan Cliffs blazing star (*Mentzelia rhizomata*), Piceance bladderpod (*Lesquerella parviflora*), Harrington's penstemon (*Penstemon harringtonii*), bald eagle (*Haliaeetus leucocephalus*), milk snake (*Lampropeltis triangulum taylori*), midget faded rattlesnake (*Crotalus viridis concolor*), and Great Basin spadefoot (*Spea intermontana*). In addition, four BLM sensitive fish species—the flannelmouth sucker (*Catostomus latipinnis*), bluehead sucker (*Catostomus discobolus*), roundtail chub (*Gila robusta*), and Colorado River cutthroat trout (*Oncorhynchus clarki pleuriticus*)—are known to inhabit the Colorado River.

Proposed Action:

Environmental Consequences:

Federally Listed, Proposed, or Candidate Plant Species

The results of a September 2007 plant survey indicate that there are no federally listed, proposed, or candidate plant species or suitable habitat for these species in the project area. Therefore, the proposed action would have “**No Effect**” on these species.

Federally Listed, Proposed, or Candidate Animal Species

No federally listed, proposed, or candidate terrestrial animal species or their habitat are known to occur within or near the project area. Therefore, no direct or indirect impacts are anticipated and the proposed action would have “**No Effect**” on these species.

Colorado River Endangered Fishes – Construction of the road and pads would increase the potential for soil erosion and sedimentation of the Colorado River. Although a minor, temporary increase in sediment transport to the Colorado River may occur, it is not likely that the increase would be detectable above current background levels. In any case, all of the federally listed, proposed, or candidate fish species associated the Colorado River are adapted to naturally high sediment loads. Therefore, the proposed action would have “**No Effect**” on these species due to increased sediment transport.

Another potential impact to these species under the proposed action is the depletion of flows in the Colorado River Basin. Adequate flows are necessary to provide for the various life-stage requirements of these native fishes. Reduced flows can reduce spawning and backwater habitats and result in lowered productivity and recruitment. Depletions can result form the use of Colorado River or tributary water for drilling, dust abatement, and hydrostatic testing of pipelines.

In May 1994, BLM prepared a programmatic biological assessment (PBA) that addressed water-depleting activities in the Colorado River Basin. In response, USFWS issued a programmatic biological opinion (PBO), which determined that depletions from the Colorado River Basin would jeopardize the continued existence of the endangered Colorado River fishes and consequently would lead to a “**May Affect, Likely to Adversely Affect**” determination for all water-depleting activities. The PBO was written to remain in effect until a total depletion of 2,900 acre-feet per year is reached for Federally permitted activities and includes measures to allow BLM to authorize projects with depletions of less than 125 acre-feet per year.

An amendment to the PBO in 2000 increased the threshold to 3,000 acre-feet per year and excluded depletions associated with oil and gas drilling, based on the assumption at that time that such operations produce more water than they deplete. BLM will soon complete a new PBA addressing the impact of depletions associated with oil and gas development in western Colorado, including the GSFO area. Once the USFWS issues a new PBO—anticipated for early summer 2008—the BLM will be responsible for tracking all wells drilled into Federal leases and reporting the corresponding depletions annually to the USFWS. In the meantime, BLM is continuing to operate under the 2000 amendment to the 1994 PBO.

BLM Sensitive Plant Species

Harrington’s penstemon (*Penstemon harringtonii*) is known to occur in sagebrush flats that range from 6,500 to 9,200 feet in elevation. The elevation of the project area is approximately 6,200 feet, below the elevational range of the species. No Harrington’s penstemon was found during the September 2007 plant survey. The closest known population of Harrington’s penstemon is located approximately 7 miles east of the project area, and this species is not known to occur farther west. Therefore, the proposed action would not affect Harrington’s penstemon.

BLM Sensitive Animal Species

Bald Eagle - The Colorado River is greater than two miles from the project area, beyond the distance within which impacts to nesting bald eagles may be expected to occur. In addition to distance, the proposed developments are screened from the Colorado River by topographic features. Therefore, no impacts to bald eagle are expected.

Milk Snake, Midget Faded Rattlesnake, and Great Basin Spadefoot – The midget faded rattlesnake is a small, pale-colored subspecies of the common and widespread western rattlesnake. The midget faded rattlesnake is endemic to a small area of southwestern Wyoming, northwestern Colorado, and adjacent Utah, including western Garfield County. Suitable habitats include sandy and rocky areas in juniper woodlands and semi-desert shrublands. The milk snake occurs in a variety of habitats in Colorado, including shortgrass prairie, sandhills, shrubby hillsides, canyons, and open stands of ponderosa pine in the foothills, pinyon-juniper woodlands, and arid river valleys (CDOW 2006). Suitable habitats for the milk snake in the project area include juniper woodland, sagebrush shrubland, and salt-desert shrub communities. In Colorado, the Great Basin spadefoot—a type of toad—inhabits pinyon-juniper woodland, sagebrush, and semi-desert shrub communities such as are found in and near the project area. It ranges from the bottoms of rocky canyons to broad dry basins and stream floodplains, although sagebrush habitats below 6,000 feet in elevation are the preferred type (CDOW 2006). Other habitat types required for their survival include: over wintering burrow sites, temporary breeding ponds and foraging areas, and safe passages between these areas.

Direct effects on these three species could include injury or mortality as a result of construction, production, and maintenance activities. These effects would be most likely during the respective activity seasons, which are April to October for the milk snake, March to October for the midget faded

rattlesnake, and May through September for the Great Basin spadefoot. Indirect effects for the two snake species could include a greater susceptibility to predation if the road or pad is used for temperature regulation. The potential for injury or mortality as a result of vehicles traveling on new roads and pads would increase for individuals of all three species. Connectivity between seasonal habitat types could also be affected by roads and vehicles. Given the scale of the project, there is a low likelihood that these species would be affected.

Colorado River Cutthroat Trout – This species is especially sensitive to increased sediment loads that can impair preferred spawning habitats by smothering eggs and reducing oxygen exchange and by covering gravel substrates. Sediment also reduces aquatic insect productivity which impacts food resources for trout and other wildlife. In order to reduce the risk, Best Management Practices (BMPs), and the COAs presented in Appendix A (Numbers 5, 9-11) would be implemented to minimize sedimentation.

No Action Alternative

Environmental Consequences: Under the no action alternative, the developments described in the proposed action would not occur. Therefore, no impacts to special status species are anticipated.

Flannelmouth Sucker, Bluehead Sucker, and Roundtail Chub – In Colorado, the flannelmouth sucker is found only in large rivers, where it occupies riffles, runs, eddies, and backwaters (Woodling 1985). The bluehead sucker prefers areas with a rock substrate and mid- to fast-flowing currents. The roundtail chub inhabits slow-moving water near areas of faster water and swims into the faster water in small groups to forage. Young-of-the-year prefer shallow runs, while juveniles concentrate in eddies.

Well pad and road construction would disturb ground and remove vegetation, increasing the potential for erosion and increased sedimentation to the Colorado River. Mitigation measures to be attached to well permits as conditions of approval (Appendix A, Numbers 5, 10, 12, and 14) would minimize sedimentation of the Colorado River and tributary streams. Although minor temporary increases may occur, they are unlikely to be detectable above background levels. For this reason, and because the flannelmouth sucker, bluehead sucker, and roundtail chub are adapted to high sediment loads, the proposed action would not be expected to adversely affect these species.

Analysis on the Public Land Health Standard for Special Status Species: The results of a recent land health assessment indicate that habitat conditions are suitable for those special status species which are known or likely to occur there (BLM 2000). Most of the areas examined were achieving Standard 3. The sites are located in old pinyon-juniper burn areas and, as a result, good plant diversity and productivity were present. Perennial grasses and forbs were common and cheatgrass was not abundant. The landscape appeared to be providing enough quality habitats to sustain the limited number of special status species with potential habitat in the area.

Since potential habitat for special status plant species is not present in the project area and no offsite or indirect impacts are anticipated, the proposed action should have no effect on these species. The proposed action should not result in a failure of the area to achieve Standard 4 for special status plants. The proposed developments would not occur under the no action alternative, and therefore, it should also have no bearing on Standard 4.

Due to the current habitat conditions and relatively small-scale of the proposed action, special status animal species are not likely to be affected. However, the proposed action would facilitate increased natural gas development which would further fragment habitat, reduce habitat connectivity, and reduce habitat patch size within the Battlement Mesa landscape. When considered with natural gas development that has occurred since the assessment, this Federal action would likely contribute to a

declining trend and further reduce the potential for meeting or maintaining Standard 4 for certain special status animal species over the long-term.

Wastes, Hazardous or Solid

Affected Environment: Hazardous and solid wastes could be introduced through implementation of the proposed action. 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 *Glenwood Springs Resource Area, Oil & Gas Leasing and Development, Draft Supplemental Environmental Impact Statement, Appendix L, Hazardous Substance Management Plan*, contains a comprehensive list of materials that are commonly used for projects of this nature in this region (BLM 1998). 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 the BLM standard lease terms and stipulations which would accompany any authorization resulting from this analysis. The document referenced above is hereby incorporated into and made a part of this Environmental Assessment Record.

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 US, 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 (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 Mesa County Emergency Operations Plan (developed by the Mesa County Office of Emergency Management), 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 exempt from this legislation. RCRA strictly regulates the management and disposal of hazardous wastes.

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.

Proposed Action:

Environmental Consequences: 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 of the road and pipelines and for refueling and maintaining equipment and vehicles. Potentially harmful substances used in the construction and operation 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 in amounts above the threshold quantities.

Surface water or groundwater could be impacted under the proposed action. Pollutants that might be released during the operational phase of the project would 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 which 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-Glenwood Springs Field Office contingency plan would apply.

These laws, regulations, standard lease stipulations, and contingency plans/emergency response resources are expected to adequately mitigate any hazardous or solid waste issues with the proposed action.

No Action Alternative:

Environmental Consequences: Hazardous or solid wastes would not be introduced to the area under this alternative.

Water Quality, Surface and Ground (includes an analysis of Public Land Health Standard 5)

Surface Water

Affected Environment: Proposed activities would occur east of the Town of Parachute and just north of the ephemeral drainage Monument Gulch. The proposed PH16 well pad would be located within an 11,470 acre unnamed sub-watershed while the proposed PI16 well pad would be located within the 2,976 acre Monument Gulch sub-watershed. The PI16 well pad would occur approximately 225 feet north of Monument Gulch and directly adjacent to a drainage ditch to the south. Activities associated with the PH16 well pad would encounter four drainage ditches, two of which were flowing during the onsite in October 2007. Downstream and to the west of the project area, Monument Gulch converges with the Colorado River just south of the Town of Parachute.

According to the *Stream Classifications and Water Quality Standards* (CDPHE, Water Quality Control Commission, Regulation No. 37), Monument Gulch is within the Lower Colorado River Basin segment 4a that includes all tributaries to the Colorado River from the confluence with the Roaring Fork River to a point immediately below the confluence with Parachute Creek. This segment has been classified aquatic life cold 2, recreation 2, water supply, and agriculture. Aquatic life cold 2 indicates that this water course is not capable of sustaining a wide variety of cold or warm water biota due to habitat, flows, or uncorrectable water quality conditions. Recreation class 2 refers to waters that are not suitable or intended to become suitable for primary contact recreation. This segment is however suitable or intended to become suitable for potable water supplies and agricultural purposes that include irrigation and livestock use. At this time, there are no water quality data for Monument Gulch.

The State of Colorado has developed a *303(d) List of Water Quality Limited Segments Requiring TMDLS* (CDPHE, Water Quality Control Commission, Regulation No. 93) which identifies stream segments that are not currently meeting water quality standards with technology based controls alone. Monument Gulch is within the Lower Colorado River Basin segment COLCLC04a that includes tributaries to the Colorado River from the Roaring Fork to Parachute Creek. This segment is listed as impaired due to selenium and has been given medium priority by the State of Colorado. At this time, Monument Gulch is not listed on the State of Colorado *Monitoring and Evaluation List* (CDPHE, Water Quality Control Commission, Regulation No. 94) that identifies water bodies suspected to have water quality problems.

Proposed Action:

Environmental Consequences: The proposed PH16 well pad would require a reroute of an existing drainage ditch to the south of the pad area. The proposed access road to PH16 would cross three drainage ditches, the first two of which were flowing in October of 2007 during the onsite. All drainage ditch crossings would require a minimum of a 48-inch culvert to maintain ditch width and function. The drainage ditch to the south of the proposed PH16 well pad would be avoided by pad construction activities altogether.

Drainage ditch crossings would require the use of fill material to span drainages which could result in additional sediment available for transport to the drainage if not properly stabilized. Rip rap and revegetation practices should be used to stabilize road fills at drainage ditch crossings. Improperly designed crossings, in particular undersized culverts and poorly aligned culverts, could result in ditch degradation that may include: ponding of flows and excess sedimentation at culvert inlets, and channel scour both at inlets and outlets.

Proposed activities would temporarily remove soil and vegetation resulting in an increase in erosion potential and offsite sedimentation. With measures to control runoff water in place, reestablishment of vegetation, and proper engineering of roads, the potential for sediment transport to drainage ditches and Monument Creek would be minimized. The mitigation measures presented in Appendix A (Numbers 5, 9-11) would be implemented to protect surface water.

No Action Alternative:

Environmental Consequences: The no action alternative would have no effect on surface water.

Waters of the US

Affected Environment: Section 404 of the Clean Water Act requires a Department of the Army permit from the US Army Corps of Engineers (USACE) prior to discharging dredged or fill material into waters of the United States as defined by 33 CFR Part 328. A USACE permit is required for both permanent and temporary discharges into waters of the United States. Due to the flashy nature of area drainages and to anticipated culvert maintenance, the USACE recommends designing drainage crossings for the 100-year event. The first flowing drainage ditch with the riparian corridor that would be encountered by the proposed access road to the PH16 well pad would be jurisdictional by definition. Less than 0.5 acres of riparian vegetation would be disturbed by the proposed crossing and this activity would be authorized by Nationwide Permit (NWP) number 14 for linear transportation projects.

Proposed Action:

Environmental Consequences: The drainage ditch crossing would require the use of fill material to span the drainage ditch which could result in additional sediment available for transport if not properly stabilized. Rip rap and revegetation practices should be used to stabilize road fill at the crossing. Improperly designed drainage crossings, in particular undersized culverts and poorly aligned culverts, could result in channel degradation that may include: excessive bank erosion at culvert outlets, ponding of flows and excess sedimentation at culvert inlets, and channel scour both at inlets and outlets. Due to the proximity of the proposed activities to this flowing drainage ditch, the mitigation measures presented in Appendix A (Numbers 5, 9-12) would be implemented to protect waters of the U.S.

No Action Alternative:

Environmental Consequences: The no action alternative would have no effect on waters of the U.S.

Groundwater

Affected Environment: The proposed activities are located within the Division of Water Resources (DWR) Water Division 5, the Colorado River Basin Main Stem. The groundwater in this division is generally found in both alluvial and sedimentary aquifers.

The project area is in the lower Piceance Basin aquifer system. The Piceance Basin contains both alluvial and bedrock aquifers. Unconsolidated alluvial aquifers are the most productive aquifers in the Piceance Basin. The groundwater exists in shallow, unconsolidated alluvium associated with the Colorado River (BLM 2006) and consists 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.

The most important bedrock aquifers are known as the upper and lower Piceance Basin aquifer systems. These consolidated bedrock aquifers occur within and above the large oil shale reserves. The upper and lower aquifers are separated by the Mahogany Zone of the Parachute Creek Member of the Tertiary Green River Formation. The Mahogany Zone is a poorly permeable oil shale, which effectively serves as an aquitard. Both bedrock aquifers overlie the older Cretaceous Mesaverde Group, the target zone of the subject wells. 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 pads will be located is covered by Quaternary Landslide Deposits.

Groundwater is recharged from snowmelt in upland areas that receive more precipitation than lower altitude areas. In the Piceance Basin, recharge flows from areas near the margins of the basin to discharge areas near principal stream valleys. In this area, recharge would be included from the northern flanks of Battlement Mesa. The groundwater moves laterally and/or upward discharging directly into streams, springs, and seeps by upward movement through confining layers and into overlying aquifers or by withdrawal from wells (USGS 2007a). The natural discharge areas generally are found along the Colorado River and its tributaries (USGS 2007b).

According to the Colorado Division of Water Resources (DWR), there are six shallow fresh water wells located within Section 16. A domestic water well located is approximately 1,300 feet southwest of the proposed well pad locations. It is listed as 220 feet deep, with a water level of 160 feet. All of the remaining fresh water wells located within this section are more than 2,000 feet from the proposed locations with well depths ranging between 100 and 300 feet and water levels ranging between 50 and 170 feet. The wells are likely completed in the Wasatch Formation or surface alluvium. The use of the wells is primarily domestic; therefore it can be assumed that the quality of the water is fit for human consumption.

Proposed Action:

Environmental Consequences: Potential impacts to groundwater resources from the proposed action would include contamination of the groundwater with produced water, drilling mud, and petroleum constituents. Hydraulic fracturing (fracing) would be incorporated to complete the wells, which would

include produced and freshwater mixed with proppants, or propping agents, to stimulate the formation to create fractures that would allow gas to travel more freely from the rock pores where the gas is trapped. It has been demonstrated that the effects of hydrofracturing would not extend beyond 500 feet from the well bore in the Piceance Basin (Wright Water Engineers 2003). Hydrofracturing would be conducted at 5,000 feet or more below ground surface, and would be unlikely to cause impacts to groundwater resources near the surface, such as springs or shallow alluvium. However, isolation of any water bearing zones during installation of the production casing would minimize the effects, as well as cementing the production casing to 200 feet above the top of the Mesaverde Group. It is highly unlikely that any deep groundwater resources would be affected, as the thick impermeable layers of rock at the top of the Williams Fork Formation would prevent water or hydrocarbons from migrating to potable water zones.

No Action Alternative:

Environmental Consequences: Under the no action alternative, there would be no impacts to groundwater resources.

Analysis on the Public Land Health Standard for Water Quality: According to the Battlement Mesa Land Health Assessment (BLM 2000) water quality in the area was adequate based on limited water quality data. The proposed action with associated mitigation and the no action alternative would not likely prevent standard 5 for water quality from being met.

Wetlands and Riparian Zones

Affected Environment: The majority of the riparian vegetation within the project area is concentrated around the first major drainage ditch that would be crossed along the access road to the proposed PH16 well pad. Here the riparian corridor is dominated by Narrowleaf cottonwood, alder, willows and in places is approximately 50 feet wide. This vegetation is being supported by an active drainage ditch that was flowing during the onsite in October of 2007. In addition, several box elder trees are present throughout the proposed PH16 well pad location. The drainage ditch just south of the proposed PI16 well pad contains Narrowleaf cottonwood trees that are also being supported by occasional flows.

Proposed Action:

Environmental Consequences: The proposed PI16 well pad is within an area that is mapped as having a Controlled Surface Use (CSU) stipulation for riparian vegetation. While this pad would occur adjacent to the drainage ditch to the south and the associated riparian vegetation, it would avoid impacting both the ditch and riparian vegetation altogether. This pad would also be located approximately 225 feet from Monument Gulch and would have no effect on its riparian corridor. The proposed PH16 well pad would result in the removal of a couple of random box elder trees that are being supported by seasonal flows in nearby drainage ditches. Of primary concern is the first drainage ditch crossing along the access road to the PH16 well pad that would result in disturbing a corridor approximately 30 feet wide by 50 feet long to accommodate the access road. The result would be the removal of less than 0.5 acres of riparian vegetation and the proposed crossing location would disturb the least amount of vegetation along the corridor. The operator would be required to restore disturbed riparian vegetation (Appendix A, Number 13).

No Action Alternative:

Environmental Consequences: The no action alternative would have no affect on riparian vegetation.

Analysis on the Public Land Health Standard for Riparian Systems: In June of 1994, the BLM determined that 1.0 mile of Monument Gulch in this vicinity was Not Functioning due to overgrazing and fire. In

May of 2000, the BLM determined that 0.6 miles of Monument Gulch in this vicinity was Functioning At Risk with an Upward trend. The proposed action and no action alternative would not likely interrupt the upward trend occurring in the gulch and would not prevent Standard 2 from being met.

Other Affected Resources

In addition to the critical elements, the resources presented in Table 3 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 below.

Access and Transportation

Affected Environment: Oil and gas development access to the project area would be from I-70, Parachute exit, south across the Colorado River, on to Battlement Parkway, and finally to CR302. Travel east about 1 mile on CR302 from junction with CR308 to existing parking area. Since access is provided on CR302, the public has legal motorized access to the project area.

Table 3. Other Resources Considered in the Analysis.			
<i>Resource</i>	<i>NA or Not Present</i>	<i>Present and 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

Proposed Action:

Environmental Consequences: The proposed action would result in a substantial, but short-term, 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 4). Once the wells are producing, the volume of traffic would decrease dramatically. During the operations phase of the project, traffic would be limited to weekly visits to the well pad for inspection and maintenance. Each well may have to be recompleted once per year, requiring three to five truck trips per day for approximately seven days.

Table 4. Traffic Associated with Drilling and Completion Activities.		
Vehicle Class	Number of trips per well	Percentage of total
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.

The addition of 0.24 mile (1,250 feet) of new road could increase motorized public access to portions of the project area and facilitate various types of public recreational uses such as car camping and sightseeing. To limit the impacts of the new road serving the PH16 pad, a steel frame traffic control gate would be installed at the initial creek crossing just north of the parking area improvements to restrict use to the oil and gas operator, the grazing permittee, BLM personnel, and other authorized individuals (see **Wildlife, Terrestrial**).

Degradation of county roads may occur due to heavy equipment travel; fugitive dust and noise would be created. Mitigation measures (Appendix A, Numbers 2, 9, and 11) would be required as conditions of approval to ensure adequate dust abatement, road construction, and road maintenance.

No Action Alternative:

Environmental Consequences: This alternative would not have an impact on access or transportation, because the development activities would not occur.

Geology and Minerals

Affected Environment: The project area is located within the southern Piceance Basin, an elongate northwest-southeast trending structural basin at the eastern edge of the Colorado Plateau. The basin is highly asymmetrical and deepest along its east side near the White River Uplift, where more than 20,000 feet of sedimentary rocks are present. It is bounded on the north by the Uinta Mountain Uplift and the Axial Arch, on the east by the Grand Hogback Monocline which lies along the west flank of the White River Uplift, on the southeast by the Gunnison and Uncompahgre uplifts, and on the west by the Douglas Creek Arch, which separates the Piceance Basin from the Uinta Basin in Utah. Surface exposures in the Piceance Basin are primarily sedimentary rocks of the Green River and Wasatch formations.

The youngest rocks in the study area are Quaternary in age and are distributed as unconsolidated sedimentary surface deposits. Landslide deposits and debris fans are sourced from the northern flanks of Battlement Mesa and flow into the Colorado River (Brown 2007). Landslide deposits consist principally of large slump blocks of basalt irregularly veneered with young (Pinedale) glacial drift (Tweto 1978). Battlement Mesa, located just south of the proposed activities, contains layers of Tertiary basalt flows and basaltic intrusions atop underlying layers of sedimentary rock, including the Green River and Wasatch Formations.

Mineral resources within the vicinity of the project area include oil and gas deposits, coal, and sand and gravel. Several known hydrocarbon-producing marine sands are located at the base of the Williams Fork Formation, including the Cameo coal zone, as well as an upper zone, known locally as the Mesaverde Formation. Located just above the Cameo coal zone, these massively stacked lenticular coastal plain and

fluvial point bar sandstones have been effectively perforated by new fracing techniques to produce good gas flows. Limited sand and gravel deposits are found in Quaternary alluvium along stream valleys.

The operator's proposed gas drilling program would target horizons within the Williams Fork Formation at a depth of 4,645 and 4,880 feet; the Coal Ridge coal zone at a depth of 6,605 to 6,880 feet; and the Rollins Member of the Iles Formation at a depth of 7,085 to 7,000 feet.

Proposed Action:

Environmental Consequences: Implementation of the proposed action would result in natural gas and associated water being produced from the hydrocarbon-bearing sands within the Mesaverde Group. The amount of natural gas that may be potentially produced from the proposed wells cannot be estimated accurately. However, if the wells become productive, initial production rates would be expected to be highest during the first few years of production, then decline during the remainder of the wells' economic lives. Natural gas production from the proposed wells would contribute to the draining of hydrocarbon-bearing reservoirs within the Mesaverde Group in this area, an action that would be consistent with BLM objectives for mineral production.

Casing programs have been designed to specifically prevent hydrocarbon migration from gas-producing strata penetrated by the well bore during drilling, initial production and after completion of the well. Identification of potential fresh water bearing zones, aquifers, gas producing zones, and under- and over-pressured formations are incorporated into drilling scenarios for the proposed wells. Estimates of what depth these zones would be encountered are used to determine drilling fluids, fluid densities, surface casing depths, and production planning. The proposed casing and cementing program has been designed to protect and isolate all usable water zones, potentially productive zones, lost circulation zones, and abnormally high-pressure zones.

No Action Alternative:

Environmental Consequences: Under the no action alternative, there would be no impacts to geology or mineral resources.

Noise

Affected Environment: The proposed pads would be constructed approximately 1 mile east of the community of Battlement Mesa. Noise in this area is created by activities associated with the oil and gas development. Drilling and completion activities are ongoing or have occurred in nearby private lands.

Proposed Action:

Environmental Consequences: Implementation of the proposed action would initially result in increased noise levels during construction of the well pads and access roads. Based on an average construction equipment noise level of 59 decibels (dB(A)) at 1,000 feet, construction noise at 0.5 mile would be approximately 47 dB(A) (Table 5). At this distance, noise levels would approximate those associated with a quiet suburban setting (EPA 1974). A nighttime noise standard of 45 dB(A) is currently used in many residential areas of Colorado that experience oil and gas operations. Noise levels would drop at a constant rate at greater distances (Harris 1991). At 1.0 mile, noise levels would be approximately 41 dB(A) and about 38 dB(A) at 1.5 miles. This noise level would likely persist during daytime hours during the entire construction period (1 to 2 weeks per well pad).

Table 5. Noise Levels Associated with Typical Construction Equipment			
Equipment	Noise Level (dB(A))		
	50 feet	500 feet	1,000 feet
Tractor	80	60	54
Bulldozer	89	69	63
Backhoe	85	65	59
Crane	88	68	62
Air Compressor	82	62	56
Dump Truck	88	68	62
Average (nearest whole db(A))	85	65	59
Source: LaPlata County, 2002			

Noise impacts from drilling and completion activities would last approximately 45 to 60 days at each well. Noise would occur continuously, 24 hours per day, during the drilling and completion period. Based on a measured noise level of 68 dB(A) at 500 feet, actions associated with drilling and completion would generate approximately 55 dB(A) at 1,000 feet. This level of noise approximates that associated with light industrial activities (EPA 1974).

These increased noise levels are not expected to have a substantial impact on residences of Battlement Mesa because the majority of the noise would be generated at a distance of approximately 1 mile. However, there are numerous residences located within 0.25 to 0.5 mile west of the proposed pads along CR302. At this distance, activities such as drilling and completion work, including the associated traffic supporting these activities, would be greater than background noise levels.

Traffic noise levels would also be elevated as a consequence of the proposed action. The greatest increase would be along access roads during the drilling and completion phases. Based on the La Plata County data presented in Table 5, approximately 68 dB(A) of noise (at 500 feet) would be created by each fuel and water truck that travels these roads. 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. Traffic noise level would impact residences located along county roads that would provide primary access into the area. While exposure to these noise levels is not likely to be harmful, it is likely to be annoying to residents.

Noise impacts would decrease during the production phase. Pumping units and compressor noise levels would be approximately 50 dB(A) at 325 to 375 feet and continued small truck traffic would generate somewhat less. These levels would be less than the construction phase, but greater than background noise levels. During maintenance and workovers, noise would increase above noise levels associated with routine well production.

No Action Alternative:

Environmental Consequences: Under the no action alternative there would be no increase in current noise levels, because the development activities described under the proposed action would not occur.

Paleontology

Affected Environment: The surface formation is Quaternary Landslide Deposits. These younger sediments overlie the older Green River and Wasatch Formations which are found in surface exposures to the south and west of the project area. The Wasatch Formation, a Class 1 formation, is found to outcrop approximately 800 feet south of the proposed location of pad PH16, and is found in surface exposures along the eastern half of proposed pad PI16. 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. If present, these would be vulnerable to surface-disturbing activities. Paleontological sites have been identified in Section 8, approximately 1 mile northwest of the project area.

Proposed Action:

Environmental Consequences: The result of a field review of the area indicated an old wildfire burn area with topography sloping toward the Colorado River to the north. Numerous burned dead stand pinyon and juniper trees litter the slopes that have been revegetated with native grasses. Basalt boulders, likely originating from the northern flanks of Battlement Mesa to the south, were conspicuously present. Unconsolidated sediments in the form of gravels and boulders were also strewn about, indicative of landslide or debris fan deposits. No bedrock outcrops were identified on either of the two pad locations. It is unlikely that any fossil occurrences would be present in these types of sediments. Any potential fossil localities have been subsequently covered and obscured by the younger landslide deposits. However, construction of the facilities and well pads associated with the proposed activities could uncover subsurface paleontological resources. The standard paleontological condition of approval would be attached to the APDs. (Appendix A, Number 14).

No Action Alternative:

Environmental Consequences: Under the no action alternative, there would be no impacts to paleontological resources.

Range Management

Affected Environment: The proposed well pads, spur roads and pipelines would be located on public land within the Dry Creek – Pete and Bill Allotment # 08125. The table below summarizes the permitted grazing use on the allotment.

Proposed Action:

Environmental Consequences: The proposed action would result in a minimal loss (< 1 Animal Unit Month [AUM]) of forage available to livestock. Rehabilitation of vegetation on the pads and pipelines would result in reestablishment of forage which usually takes about 3-5 years. It is not anticipated that the loss would require adjustment of the livestock stocking rate.

Livestock may also be minimally disturbed by the increase in human activity during pad, road and pipeline construction, drilling and completion activities, and maintenance of the gas facilities.

Table 6. Permitted Use of the Pete and Bill Allotment				
<i>Allotment</i>	<i>Permittee</i>	<i>Livestock Kind & Number</i>	<i>Period of Use</i>	<i>Animal Unit Months (AUMs)</i>
Dry Creek Pete and Bill # 08125	Sharon Gardner	Cattle 36	05/01 – 06/15	54
		Cattle 36	10/01 – 10/31	1
		Cattle 10	10/01 – 10/31	10
		Cattle 10	10/01 – 10/31	10
	John & Phyllis Hyrup	Cattle 182	05/01 – 06/15	275
		Cattle 182	06/15 – 10/15	22

Any range improvement projects disturbed or damaged during construction or drilling activities shall be repaired or replaced by the operator (Appendix A, Number 15).

Fencing would be required to prevent grazing impacts after interim reclamation of the pads (Appendix A, Number 5).

No Action Alternative:

Environmental Consequences: Under the no action alternative, no impacts to range resources would occur.

Realty Authorizations

Affected Environment: In order to legally occupy the surface of the proposed PI16 pad (Federal surface), for the drilling of one private well (Federal Hagen 15-13BB which has a bottomhole in private minerals under Hagen surface) and the installation of production equipment, a BLM right-of-way grant (ROW) would be required.

Proposed Action:

Environmental Consequences: Under the proposed action, the ROW authorization would be granted subject to appropriate terms and conditions. This authorization would grant the operator legal access to occupy the PI16 pad to drill the fee well and install support equipment for the well. All surface and site-specific Conditions of Approval (Appendices A and B) would be attached to the ROW authorization.

No Action Alternative:

Environmental Consequences: Since no new pads, roads, or pipelines would be constructed under the no action alternative, issuance of the right-of-way would not be necessary.

Recreation

Affected Environment: The project area is located on public lands administered by the BLM. The area offers open space where visitors can participate in primitive or unconfined recreational activities in a relatively undisturbed setting. There are no developed recreational facilities such as campgrounds or picnic areas within the project area, although an unimproved “parking” area along CR302 adjacent to the project area has been used for many years. In recent years, this “parking” area has been used to stage drill rig mobilizations on private lands along Battlement Creek. Dumping of brush and trash has been a problem at the site. The project area currently features some evidence of visitor use, particularly during the hunting seasons and snowy periods during the winter months.

The recreation resource management objectives for public lands in the project area are to ensure the continued availability of outdoor recreational opportunities, to reduce the impacts of recreational use on fragile and unique resource values, and to provide for visitor safety (BLM 1984).

All components of the project fall within an area designated as Roaded Natural (RN). Roaded Natural settings are characterized by predominantly natural-appearing environments with moderate evidence of the sights and sounds of people. Such evidence usually harmonizes with the natural environment. Interaction between users may be moderate to high, with evidence of other users prevalent. Resource modification and utilization practices are evident, but harmonize with the natural environment. Conventional motorized use is allowed and incorporated into construction standards and design of facilities.

The project area is within an Extensive Recreation Management Area (ERMA), where recreation is a significant activity but not the principal management focus. Management direction for the ERMA is to “provide visitor information, minimal sanitation facilities and access [and to] manage ERMAs to resolve management issues and for off-road [vehicle] (ORV) use” (BLM 1984).

The primary recreational use in the area is seasonal big game hunting. Hunting is managed by the Colorado Division of Wildlife (CDOW) from the end of August through January. Primary hunting opportunities are for elk and mule deer. Bow hunting is permitted early in the season. Participation in other dispersed recreational activities is low. Other dispersed activities include wildlife viewing, mountain biking, hiking, and horseback riding. Winter snowfall is inadequate to support snowshoeing, snowmobiling, or cross-country skiing. Although data on recreational visitation are not available, overall use levels are generally low (BLM 2006). According to BLM records, one commercial outfitter holds a permit to guide hunters on BLM lands in the project area.

Proposed Action:

Environmental Consequences: Short-term, project-related construction activities and the drilling and completion of wells would generate vehicle traffic, dust, noise, and increased human activity. Since hunting depends on the presence of game species, and hunters generally prefer relatively quiet settings, it is likely that hunting activities would be disrupted in the local area. Both game species and hunters would likely avoid active construction areas and well drilling activities and would be displaced to other locations within and outside the area. Similarly, OHV riders and other types of recreational visitors could choose to recreate in other locations over the short-term due to the presence of heavy trucks and intensive human activity.

Over the operational life of the project, the presence of natural gas wells, production equipment, and other facilities would change the character of the areas’ landscape from natural and undeveloped to relatively altered and developed, at least in areas where these facilities would be visible. This change in the

character of the area could diminish the recreational experience for visitors near well pad locations. The physical, social, and administrative setting components of the Roaded Natural setting could shift closer to a Rural setting because of landscape modifications, use, and the more evident sights and sounds of development.

The improvements proposed for the existing parking area along CR302 would enhance parking opportunities, particularly during snow-bound winters, for snowmobile users up Battlement Creek and dispersed winter recreation users.

The addition of project-related access roads, however, could increase motorized public access to portions of the project area and facilitate various types of public recreational uses such as car camping and sightseeing. However, to maintain site security and minimize long-term impacts to wildlife, the PH16 access road would be gated and access restricted (see **Wildlife, Terrestrial**). Public motorized travel to Monument Gulch along BLM Road #8163 would continue to remain available with the installation of the proposed gathering pipeline for the two pads.

Potential conflicts between hunting and the proposed project activities could arise. If hunters were to discharge their firearms in close proximity to active project locations, the potential for accidents would increase.

No Action Alternative:

Environmental Consequences: With the lack of additional construction activity, impacts to recreation under the no action alternative would not be expected to change from the present condition.

Socio-Economics

Affected Environment: The project area is located within Garfield County, Colorado. The population of Garfield County has grown by approximately 2.8 percent per year from 2000 to 2005, resulting in an increase from 44,300 to 51,000 residents (U.S. Bureau of the Census 2005). The annual population growth rate is projected to decline gradually through the year 2030, growing to a population of about 97,000 by that time (Colorado Department of Local Affairs 2003).

In the year 2000, industry groups in Garfield County with the highest percentage of total employment were construction (20.4 percent), tourism (10.7 percent), retail trade (13.7 percent), and education and health (15.4 percent). An estimated 13.3 percent 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 percent of total employment. In the year 2001, an estimated 239 persons were employed within the mining industry in Garfield County.

In 2005, oil and gas assessed valuation in Garfield County amounted to \$984,417,880 or about 55 percent of total assessed value in the county. Total tax revenues from property taxes and special district levies were \$86,678,430. Based on this assessed value, the top five taxpayers in the county in 2005 were mining companies.

Federal mineral royalties are levied on oil and gas production from Federal mineral leases. For oil and gas production in Garfield County in 2003, total Federal royalties collected amounted to \$125,683,586. Half of those royalties of \$62,841,784 was paid to the State of Colorado. The state's share of the revenue was then distributed to a variety of state and local agencies. Counties where oil and gas were produced received 8 percent of total revenues, local towns in those counties received 5 percent, and local school

districts received 5 percent. In 2003, the Garfield County share of Federal mineral lease royalties was \$1,332,000.

Proposed Action:

Environmental Consequences: The proposed action would minimally impact the local economy of Garfield County through the creation of additional job opportunities in the oil and gas industry and in supporting trades and services. In addition, local governments in Garfield County would experience an negligible increase in tax and royalty revenues.

Some minor economic loss to private land owners and a permitted outfitter and guide may result from the potential displacement of big game and resulting reduction in big game hunting within the project area.

The proposed action could result in negative social impacts including: 1) a change in the recreational character of the area (see **Recreation**), 2) reducing scenic quality (see **Visual Resources**), 3) increased dust levels especially during construction (see **Air Quality**), and 4) increasing traffic (see **Access and Transportation**).

No Action Alternative:

Environmental Consequences: With no additional construction or drilling work occurring on public land, the present economic conditions would change only in a minor way, subject to any additional drilling on nearby private land. Local governments would not benefit from the Federal mineral royalties because the proposed developments would not occur.

This alternative would cause only nominal social impacts. Because there would be little change in the existing recreational character of the area, further reductions in the scenic quality of the area would not occur, and dust levels and traffic would not increase.

Soils (includes an analysis of Public Land Health Standard 1)

Affected Environment: According to the *Soil Survey of Rifle Area, Colorado* (USDA 1985), the proposed activities would be located on the soil map units Ildefonso stony loam and Potts-Ildefonso complex. The following is a brief description of these soil map units encountered.

- Ildefonso stony loam – This deep, well-drained soil is found on mesas, benches, and sides of valleys at elevations ranging from 5,000 to 6,500 feet and on slopes of 6 to 25 percent. This soil is derived primarily from basalt and may contain a small amount of eolian material at the top of the unit. Surface runoff for this soil is medium and erosion hazard is moderate. Primary uses for this soil include grazing and wildlife habitat.
- Potts-Ildefonso complex – This complex is found on mesas, alluvial fans, and the sides of valleys at elevations ranging from 5,000 to 6,500 feet and on slopes of 12 to 25 percent. Parent material for this soil complex consists of sandstone, shale, and basalt. This soil complex is deep, well drained, and has medium surface runoff and moderate erosion hazard. Uses for this soil complex include limited grazing and wildlife habitat.

Proposed Action:

Environmental Consequences: Some soil loss, loss of soil productivity, and increase in sediment available for transport would result from construction activities. Due to the proximity of existing well pads to

drainage ditches and Monument Gulch, mitigation measures would be implemented to minimize potential impacts associated with soil loss and transport (Appendix A, Number 5, 9-11).

No Action Alternative:

Environmental Consequences: Under the no action alternative there would be no effect on soil resources.

Analysis on the Public Land Health Standard for Upland Soils: According to the Battlement Mesa Area Land Health Assessment (BLM 2000), proposed activities would occur within the 8,255 acre Dry Creek-Pete and Bill allotment. During the assessment, it was determined that all 8,255 acres of the allotment were achieving or moving towards achieving standards. The proposed action and no action alternative would not likely prevent standard 1 from being achieved.

Vegetation (includes an analysis of Public Land Health Standard 3)

Affected Environment: The project area was historically a pinyon-juniper woodland before it was burned in the 1987 Battlement Mesa fire. After the fire, the BLM reseeded the area with native species such as wheatgrasses and globemallow, and non-native species such as alfalfa, smooth brome, and orchardgrass. Native species that regenerated after the fire include shrubs such as rubber rabbitbrush and fourwing saltbush, and native forbs like golden aster (*Heterotheca villosa*) and tansy-aster (*Machaeranthera* spp.). Cottonwoods (*Populus angustifolia*) and willows (*Salix* spp.) are found along a perennial drainage which transects the project area.

Proposed Action:

Environmental Consequences: Total short-term surface disturbance for the two new pads and associated access roads and pipelines would be 11.3 acres. With implementation of reclamation practices identified in Appendix A (Number 5), establishment of desirable herbaceous vegetation on the unused portions of the pads, pipelines, and roads could be restored within 2 to 3 years. The establishment of mature shrubs could take from 5 to 25 years, and the establishment of trees would take even longer.

Interim reclamation would result in about a 75-percent reduction in surface disturbance that would remain over the long-term life of the project. Assuming each pad is reclaimed to the extent possible, total long-term surface disturbance associated with the proposed action would be approximately 4.7 acres.

No Action Alternative:

Environmental Consequences: Under the no action alternative, no construction or development activities would take place. Therefore, vegetation would not be affected.

Analysis on the Public Land Health Standard for Plant and Animal Communities (partial, see also **Wildlife, Aquatic and Wildlife, Terrestrial**): The results of Battlement Mesa Area Land Health Assessment indicate that portions of these lands were found not to be meeting the Standard 3 (BLM 2000). Specific concerns related to the condition of the sagebrush and pinyon-juniper habitats that comprise important big game winter range as well as habitat fragmentation, loss of habitat, and increased human use associated with natural gas exploration and development.

If the implementation of mitigation measures is successful, the proposed action is not likely to contribute to further degradation relative to Standard 3. The no action alternative would have no bearing on the ability of the area to meet the public land health standard for plant and animal communities.

Visual Resources

Affected Environment: The proposed action would take place on public lands within an area classified by the BLM as Visual Resource Management (VRM) Class IV (BLM 1984). The management of visual resources in Class IV areas allows for major modifications of the existing character of the landscape. In these areas, alterations may dominate the view and may be the major focus of viewer attention. However, attempts should be made to minimize impacts in Class IV areas through careful project design aimed at minimizing disturbance and repeating basic landscape elements.

Vegetation communities are dominated by pinyon-juniper interspersed with sagebrush. The landscape colors are dominated by tan, gold, and green vegetation, and grayish tan soils. The colors and values (i.e., degrees of lightness and darkness) of the soils and vegetation are similar and exhibit little contrast during most months of the year. In spring and early summer, greening vegetation displays the greatest color contrasts with the areas soils. The area also contains several old burns resulting from wildfire; these areas provide natural mosaic openings within the pinyon-juniper vegetation.

Existing well development and associated access roads occur on private lands adjacent to the project area. Most of the existing visual impacts to viewers on I-70 and residences south of the highway are related to natural gas development on private lands because viewing areas are fairly close to developments, and the relatively flat terrain of the valley floor provides unimpeded views of natural gas facilities from I-70 and residential areas.

Proposed Action:

Environmental Consequences: Short-term visual impacts from construction, drilling, and completion activities would occur on the two new pads. The existing landscape would be changed by the introduction of new elements of line, color, form, and texture. New pads and other surface facilities, new roads, and new pipelines would increase 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.

Construction activities would occur over a 1- to 2-week period for each pad site. At a given location, activity would occur 24 hours per day for the 30- to 60-day drilling and completion phases. 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.

Long-term impacts of the proposed action would consist of reduced visual character within portions of the landscape where new pad facilities, pipelines, and roads cannot be screened from sight. The visibility of new areas of surface disturbance and production equipment would increase the existing visual contrasts associated with human modifications already present in the project area. Interim reclamation (Appendix A, Number 5), as well as the use of natural colors on production equipment (Appendix A, Number 16), would largely mitigate long-term impacts.

No Action Alternative:

Environmental Consequences: Under the no action alternative, none of the development described under the proposed action would be authorized and no new surface disturbance on public lands would occur. Visual resources would remain unchanged from present conditions.

Wildlife, Aquatic (includes an analysis of Public Land Health Standard 3)

Affected Environment: There are no perennial streams in the project area and, therefore, fish populations are not present. The proposed action would occur in an area of dissected terrain containing a number of dry washes that drain snowmelt and stormwater to the Colorado River approximately 2.6 miles from the project area. Monument Gulch near the PI16 pad drains a much larger area than the washes and therefore likely contains amphibians and a variety of aquatic invertebrates. It is however, considered a non-fish bearing stream (BLM 2007). A recent survey of ephemeral streams in Colorado, Arizona, and New Mexico indicates that a wide variety of macroinvertebrates and microinvertebrates could inhabit the project area (PCWMD 2006). A variety of both native and non-native fishes are found in the Colorado River.

Proposed Action:

Environmental Consequences: Implementation of the proposed action including surface disturbance on approximately 11.3 acres could result in increases in erosion and sedimentation into nearby drainages and eventually the Colorado River. Erosion and sedimentation has the potential to impact fish species in the Colorado River by silting in important spawning substrates and limited pool habitat, and by covering gravels and cobbles needed by aquatic insect larvae important as a food supply for the introduced trout and some native fishes. The potential increase of sedimentation into the Colorado River would likely be nominal given background sediment loads currently carried by the river. Sediment intolerant aquatic wildlife could be negatively affected as increased erosion potential would persist and potentially impair water and habitat quality, especially in ephemeral streams near new roads and pads. Increased traffic on the county road may also slightly increase sediment loads to nearby streams. To minimize erosion and sedimentation, mitigation measures would be implemented (Appendix A, Numbers 5, 9-11).

No Action Alternative:

Environmental Consequences: Under the no action alternative, no construction or development activities would take place; therefore, aquatic wildlife would not be affected.

Analysis on the Public Land Health Standard 3 for Plant and Animal Communities (partial, see also **Vegetation and Wildlife, Terrestrial**): Although the proposed action has the potential to increase sediment, the anticipated increase would not increase sediment loads above normal levels. The proposed action, in conjunction with a large amount of similar activity occurring within the larger watershed, may trend the area away from meeting Standard 3 for sediment-sensitive aquatic wildlife. The no action alternative would not affect on Standard 3 because the developments would not occur.

Wildlife, Terrestrial (includes an analysis of Public Land Health Standard 3)

Affected Environment: The project area provides habitats for various species of big game, small game, and non-game mammals and birds that are found in low- to mid-elevation habitats of west-central Colorado. The area is mapped as overall range for mule deer (*Odocoileus hemionus*), Rocky Mountain elk (*Cervus elaphus nelsoni*), black bear (*Ursus americanus*), and mountain lion (*Felis concolor*). It is also mapped as mule deer and elk winter range which is considered a high value habitat (CDOW 2006).

Proposed Action:

Environmental Consequences: Direct impacts to terrestrial wildlife from the proposed action may include mortality, disturbance, nest abandonment/nesting attempt failure, or site avoidance/displacement from otherwise suitable habitats. These effects may be the result of approximately 11.3 acres of habitat loss or

modification, increased noise from vehicles and operation of equipment, increased human presence, and collisions between wildlife and vehicles. Impacts would be more substantial during critical seasons, such as winter or during reproduction. Mule deer and elk are often restricted to smaller areas during the winter months and may expend high amounts of energy to move through snow, locate food and maintain body temperature. Increased human use in the area, particularly during construction, drilling and completion activities, would likely displace some animals away from preferred habitats, potentially depleting much-needed energy reserves that may lead to decreased over-winter survival.

Additional, indirect habitat loss may occur if increased human activity (e.g., traffic, noise) associated with infrastructure cause mule deer and elk to be displaced or alter their habitat use patterns. Indirect habitat loss generally includes habitat within an eighth of a mile of a road or well pad (e.g., BLM 1999). To limit the impacts of the new road serving the PH16 pad, a steel frame traffic control gate would be installed at the initial creek crossing just north of the parking area improvements. This would prohibit public motorized access and restrict use to the oil and gas operator, the grazing permittee, and BLM personnel.

Federal Lease COC 01524 contains no special stipulations for protecting wintering mule deer and elk. However, a winter habitat timing limitation (TL) prohibiting construction, drilling, and completion activities between January 1 and March 1 would be included with the permit as a COA (Appendix A, Number 17). The TL would not apply to operations and maintenance activities. Under certain conditions, exceptions could be granted at the discretion of the Authorized Officer. Compliance with this timing limitation would reduce impacts to wintering big game by minimizing activity during a portion of the critical winter months.

No Action Alternative:

Environmental Consequences: Because new development activity would not take place, terrestrial wildlife would not be affected.

Analysis on the Public Land Health Standard 3 for Plant and Animal Communities (partial, see also **Vegetation and Wildlife, Aquatic**): According to the land health assessment of the Battlement Mesa area (BLM 2000), the current condition of fish and wildlife habitats varies across the landscape. Habitats have been altered by roads, power lines, pipelines, fences, residential development, oil and gas development, and livestock and wild ungulate grazing. Sagebrush habitats vary from poor to good condition with evidence of light to heavy use. The sagebrush stands provide important habitat for a variety of wildlife species and are particularly important as food and cover for wintering big game.

Pinyon-juniper habitats also vary in condition. Many sites have a sparse herbaceous understory, while others have a better developed herbaceous component. Pinyon-juniper woodlands are important habitat for nesting raptors and other birds, and provide shelter and cover for a variety of wildlife. According to the assessment, mule deer numbers have decreased dramatically since the late 1980s, while the numbers appear to be increasing for the elk population, which is shifting to a more permanent residency on BLM lands within the Battlement Mesa landscape. In addition, winter range habitats in the area may be at or above carrying capacity (USDI 2000). The proposed action would add to the disturbance of habitat already altered by the 1987 Battlement Mesa fire and is therefore likely to contribute to a downward trend for the Public Land Health Standard for Animal Communities.

Because new development activity would not take place under the no action alternative, Standard 3 for Plant and Animal Communities would not be affected.

SUMMARY OF CUMULATIVE IMPACTS

The *Glenwood Springs Oil and Gas Leasing and Development Final Supplemental EIS* (FSEIS) (BLM 1999) analyzed three alternatives for oil and gas development in the Glenwood Springs Resource Area (GSRA). The assessment included an analysis of impacts of past, present, and reasonable foreseeable future actions, including predicted future oil and gas development, on both public and private lands. Since the FSEIS presents the most current analysis of cumulative impacts in the project area, it is incorporated by reference.

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 highway corridors. More recently, these changes are cumulative to the growth of residential and commercial uses, utility corridors, oil and gas developments, and other rural industrial uses. These increasing activity levels have accelerated the accumulation of impacts in the area. These impacts have included: (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 FSEIS were 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: (1) the rate of development, particularly oil and gas development, is increasing in the area, resulting in an accelerated accumulation of individually nominal effects; and (2) the majority of residential and commercial expansion, as well as oil and gas development, have occurred, and is likely to continue to occur, on private holdings where mitigation measures designed to protect and conserve resources are not in effect.

It is clear that the proposed action would contribute to the collective adverse impact for some resources such as air quality, vegetation, migratory birds, terrestrial wildlife, and other resources. However, the contribution to the accumulated effects would be minor because the scale of the proposed development is relatively small and mitigation measures represented by the conditions of approval for resource protection are mandated for implementation (see Appendix A for surface-use COAs, Appendix B for site-specific COAs, and Appendix C for downhole COAs)

PERSONS AND AGENCIES CONSULTED:

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Bryan Whiteley, Reclamation/StormWater Coordinator, EnCana Oil & Gas (USA) Inc.
John Doose, Landman, EnCana Oil & Gas (USA) Inc.
Ted Taggart, Surveyor, Wasatch Surveying
Colorado State Historic Preservation Officer

INTERDISCIPLINARY REVIEW:

<i>Name</i>	<i>Title</i>	<i>Responsibility</i>
Jim Byers	Natural Resource Specialist	Team Leader, Access and Transportation, Range, Solid and Hazardous Wastes, Visual Resources, Recreation, Socio-Economics
Mark Ennes	Planning and Environmental Coordinator	NEPA Compliance
Beth Brenneman	Ecologist	Special Status Species (plants), Invasive Non-native Species, Vegetation
Karen Conrath	Geologist	Geology and Minerals, Groundwater, Paleontology
Jeff Cook	Wildlife Biologist	Terrestrial and Aquatic Wildlife, Special Status Species (animals), Migratory Birds
Cheryl Harrison	Archaeologist	Cultural Resources, Native American Religious Concerns
Jeff O'Connell	Hydrologist	Soil, Air, Surface Water, Waters of the U.S., Noise, Riparian
Marty O'Mara	Petroleum Engineer	Downhole COAs

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CO140-2008-027 EA

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 proposal to drill 14 Federal wells and three private wells from two proposed pads (PH16 & PI16) located along Garfield County Road 302 east of Battlement Mesa. The construction of 1,250 feet of new road spurs, the installation of a gas gathering line, and the improvement of the existing parking area are also approved. This decision will provide for the orderly, economical, and environmentally sound exploration and development of oil and gas resources on the valid oil and gas lease.

RATIONALE:

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. The environmental impacts have been mitigated with measures included in the attached Conditions of Approval.

MITIGATION MEASURES: Mitigation measures presented in Appendices A, B and C will be incorporated as Conditions of Approval for both surface and drilling operations.

NAME OF PREPARER: Jim Byers, Natural Resource Specialist

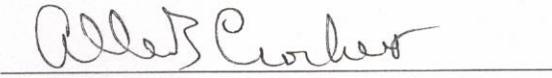
SIGNATURE OF PLANNING AND ENVIRONMENTAL COORDINATOR:



Planning and Environmental Coordinator

2/26/08
Date

SIGNATURE OF AUTHORIZED OFFICIAL:



Authorized Officer

2-26-08
Date

APPENDIX A
SURFACE USE CONDITIONS OF APPROVAL

**SURFACE USE CONDITIONS OF APPROVAL
C0140-2008-027 EA**

1. Administrative Notification. At least 48 hours prior to construction of access road, pipeline and/or well pad, the operator shall notify BLM representative of construction startup plans. The proposed pad, road and pipelines will be staked and flagged prior to start of construction.
2. Dust Abatement. The operator shall implement dust abatement measures as needed or directed by the BLM authorized officer. The level and type of treatment (watering or application of various dust agents, surfactants, and road surfacing material) may be changed in intensity and must be approved by the BLM authorized officer.
3. Cultural Resource Education/Discovery. All persons in the area who are associated with this project must 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 authorized officer 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 must stop in the vicinity of the discovery, and the discovery must be protected for 30 days or until notified to proceed by the authorized officer.

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

Within five working days, the authorized officer will inform the holder as to:

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

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

Antiquities, historic, prehistoric ruins, or objects of scientific interest that are outside the authorization boundaries but directly associated with the impacted resource shall be included in this evaluation and/or mitigation.

Antiquities, historic, prehistoric ruins, or objects of scientific interest, identified or unidentified, that are outside the authorization and not associated with the resource within the authorization shall be protected. Impacts that occur to such resources and are related to the authorizations activities shall will be mitigated at the operator's cost, including Native American consultation cost.

4. Weed Control. The operator shall regularly monitor and promptly control noxious weeds or other undesirable plants species as set forth in the Glenwood Springs Energy Office *Noxious and Invasive Weed Management Plan for Oil and Gas Operators*, dated March 2007. A Pesticide Use Proposal (PUP) must be approved by BLM prior to the use of herbicides. Contact Beth Brenneman, Glenwood Springs Energy Office Ecologist, at 970-947-5232 or beth_brenneman@blm.gov.
5. Reclamation. Reclamation 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). The specific measures described below shall be followed during interim reclamation of disturbed surfaces associated with well pads, access roads, and pipelines. These measures, except seedbed preparation, shall also apply to temporary reclamation of topsoil storage piles and surfaces that are subject to interim reclamation but not scheduled to undergo interim reclamation until more than 1 year has elapsed following the surface disturbance.
 - a. Seedbed Preparation. For interim reclamation, all slopes shall be reshaped prior to seedbed preparation. Initial seedbed preparation shall consist of backfilling, leveling, and ripping all areas to be seeded to a minimum depth of 18 inches with a furrow spacing of 2 feet, followed by recontouring the surface and then spreading the stockpiled topsoil evenly. Prior to seeding, the seedbed shall be scarified and left with a rough surface. No depressions shall be left that would trap water and form ponds. Final seedbed preparation shall consist of contour cultivating to a depth of 4 to 6 inches within 24 hours prior to seeding. NOTE: Seedbed preparation is not required for topsoil storage piles or other areas of temporary reclamation. Requests for use of soil amendments, including basic product information, shall be submitted to the BLM for approval.
 - b. Seed Mixes. Selection of seed to be used in temporary or interim reclamation shall comply with the menu-based seed mixes in the letter provided to oil and gas operators dated April 16, 2007. For private surfaces, the menu-based seed mixes are recommended, but the landowner would have ultimate authority over the seed mix to be used in reclamation. The seed shall be certified free of noxious weeds. 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 supplied to the BLM Glenwood Springs Energy Office Ecologist (Beth Brenneman, 970-947-5232 or beth_brenneman@blm.gov) 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.

Note that temporary reclamation allows use of a seed mix containing sterile hybrid non-native annual species in addition to native perennial species. Note also that for both temporary and interim reclamation, the BLM seed mixes no longer include forbs (broadleaf herbaceous species) or shrubs.

- c. Seeding Procedures. Seeding shall be conducted no more than 24 hours following completion of final seedbed preparation. 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 April 16, 2007).

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. Hydroseeding and hydromulching may be used in temporary reclamation or in areas where drill-seeding or broadcast-seeding/raking are impracticable. Hydroseeding and hydromulching must 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. Requirements for reseeding of unsuccessful temporary reclamation will be considered on a case-by-case basis.

- d. Mulch. Mulch shall be applied within 24 hours following completion of seeding. In areas of interim reclamation that used drill-seeding or broadcast-seeding/raking, mulch shall consist of crimping certified weed-free straw or certified weed-free native grass hay into the soil. Hydromulching may be used in areas of interim reclamation where crimping is impracticable, in areas of interim reclamation that were hydroseeded, and in areas of temporary reclamation regardless of seeding method.

NOTE: As an exception to this provision, mulch is not required in areas where erosion potential mandates use of a biodegradable erosion-control blanket (straw matting).

- e. 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 authorized officer. Biodegradable straw matting, bales or wattles of weed-free straw or weed-free native grass hay, or well-anchored fabric silt fence shall be used on cut-and-fill slopes and along drainages to protect against soil erosion. Additional BMPs shall be employed as necessary to reduce erosion and offsite transport of sediment.
- f. Site Protection. The pads 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 authorized officer will approve the type of fencing.
- g. Monitoring. The operator shall conduct annual monitoring surveys of reclaimed areas and shall submit an annual monitoring report to the authorized officer 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 authorized officer.
- h. Deadline for Temporary and Interim Reclamation. The operator will be allowed to construct well pad to the maximum expected pad size necessary to drill and complete the number of wells proposed for this location. After 1 year from spudding the initial well, or 1 year after spudding any successive well(s), the operator shall implement and complete the standard interim reclamation practices identified above OR submit proposed best management practices to be approved by the authorized officer that would be implemented on the "open" pad to control

stormwater runoff, weed control, wildlife protection, dust abatement, and/or visual resource management.

Areas subject to interim reclamation but scheduled to remain in a disturbed condition for more than 1 year shall undergo temporary reclamation, as described above.

Contact Beth Brenneman, Glenwood Springs Energy Office Ecologist, at 970-947-5232 or beth_brenneman@blm.gov.

6. Migratory Birds. It shall be the responsibility of the operator to comply with the Migratory Bird Treaty Act with respect to “take” of migratory bird species. “Take” means to harass, harm, 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 reserve pits, produced water pits, and evaporation pits, that store or are expected to store fluids which may pose a risk to such birds (e.g., migratory waterfowl, shorebirds, wading birds, and raptors) during completion and after completion activities have ceased. Several established methods to prevent bird access are known to work. Methods may include but are not limited to netting, the use of bird-balls, or other alternative methods that effectively prevent bird access/use. Regardless of the method used, it should be applied within 24 hours after completion activities have begun. All mortality or injury to species protected by the Migratory Bird Treaty Act shall be reported immediately to the BLM project lead.
7. Raptor Nesting. Raptor nest surveys conducted in January 2008 for the developments described in the proposed action 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. Therefore, a Raptor Nesting Timing Limitation COA is not attached to this APD. Although BLM considers surveys conducted for a NEPA Environmental Assessment to be valid for 5 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 (or drilling) 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. Contact Jeff Cook, Glenwood Springs Energy Office Wildlife Biologist, at 970-947-5231 or jeffrey_cook@blm.gov).

8. Native American Religious Concerns. The Native American Graves Protection and Repatriation Act (NAGPRA), requires that if inadvertent discovery of Native American Remains or Objects occurs, activity shall cease in the area of discovery, a reasonable effort made to protect the item(s) discovered and immediate notification made to the BLM authorized officer, as well as the appropriate Native American group(s) (IV.C.2). Notification may be followed by a 30-day delay (NAGPRA Section 3(d)).
9. Road Construction Standards and Surfacing. Roads shall be crowned, ditched, surfaced, and constructed to BLM Gold Book standards. Roads shall be periodically regaveled when ruts exceed 6 inches in depth or as directed by the authorized officer. Initial gravel application will be a minimum lift of 6 inches.

10. Culverts. Culverts at drainage crossings shall be installed during no-flow or low-flow conditions and shall be designed and installed to pass a 25-year or greater storm event. On perennial 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 18 inches. Contact Jeff O'Connell, Glenwood Springs Energy Office Hydrologist at 970-947-5215 or jeffrey_o'connell@blm.gov.

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 recommends designing drainage crossings for the 100-year event. Contact Sue Nall at 970-243-1199 x16 or susan.nall@usace.army.mil.

11. Road Maintenance. The operator shall be responsible for providing timely year-round road maintenance and cleanup on the access road. A regular schedule for maintenance shall include, but not be limited to, blading, ditch and culvert cleaning, road surface replacement, and dust abatement. The road shall be crowned, ditched, and drained with culverts and/or water dips. When rutting within the traveled way becomes greater than 6 inches, blading and/or gravelling shall be conducted as approved by the authorized officer.
12. Jurisdictional Waters of the U.S. The operator shall obtain appropriate permits from the U.S. Army Corps of Engineers 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 Sue Nall, Regulatory Specialist, Colorado/Gunnison Basin Regulatory Office, U.S. Army Corps of Engineers, at 970-243-1199 x16 or susan.nall@usace.army.mil.

13. Wetlands and Riparian Zones. The operator shall restore temporarily disturbed wetlands or riparian areas. The operator shall consult with the BLM Glenwood Springs Energy Office to determine appropriate mitigation, including verification of native plant species to be used in restoration. Contact Jeff O'Connell, Glenwood Springs Energy Office Hydrologist, at 970-947-5215 or jeffrey_o'connell@blm.gov.
14. 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 authorized officer of the findings. The discovery must be protected until notified to proceed by the BLM authorized officer.

As feasible, the operator shall suspend ground-disturbing activities at the discovery site and immediately notify the BLM authorized officer of any finds. The BLM authorized officer will, as soon as feasible, have a BLM-permitted paleontologist examine 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.

15. Protection of Range Improvements. 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 shall 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 cattleguard with associated bypass gate shall be installed across the roadway to control grazing livestock.

16. Facility Placement and Color. To reduce the view of production facilities from visibility corridors and private residences, facilities shall not be placed in visually exposed locations (i.e., they shall be located against backdrops or cut side of pad) and shall be placed to allow the maximum reshaping of cut-and-fill slopes. Furthermore, all above-ground facilities shall be painted Shale Green (Munsell 5Y 4/2) or another color specified by the authorized officer.

As a general rule, unless otherwise approved by BLM authorized officer, the production pack(s) and storage tanks(s) shall be set no more than 100 feet from the nearest wellhead to satisfy visual resource and interim reclamation objectives.

17. Big Game Winter Timing Limitation. Although no specific Timing Limitation (TL) for big game winter range is stipulated on the lease, a 60-day TL shall be applied to minimize impacts to wintering big game. Under this TL, no construction, drilling or completion activities shall occur during the period from January 1 to March 1 annually. To further reduce impacts to wintering big game, remote sensing should be used for production monitoring, and unavoidable monitoring or maintenance activities should be conducted between 9 a.m. and 3 p.m., to the extent practicable. These additional recommendations apply to the period from December 1 to April 30. Contact Jeff Cook, Glenwood Springs Energy Office Wildlife Biologist, at 970-947-5231 or jeffrey_cook@blm.gov.
18. Pipeline Installation. For pipelines installed beneath stream crossings, the operator shall bury the pipeline at a minimum depth of 4 feet below 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.

APPENDIX B
SITE-SPECIFIC CONDITIONS OF APPROVAL

**SITE-SPECIFIC CONDITIONS OF APPROVAL
C0140-2008-027 EA**

Site-Specific COAs Applicable to Pad PH16

In addition to the standard Surface Use Conditions of Approval, the following Site-specific Conditions of Approval shall apply to the PH16 pad:

Installation of Traffic Control. To limit the impacts of the new road serving the PH16 pad, a steel frame traffic control gate shall be installed at the initial creek crossing just north of the parking area improvements to restrict use to the oil and gas operator, the grazing permittee, BLM personnel, and other administrative users. Such gate shall be installed within 14 days after the date the first well drilled on the pad goes into production, unless otherwise authorized by the BLM. Any additional means necessary to prevent public motorized access such as boulders or fencing shall be installed and maintained by the operator.

Parking Area Improvements. The existing parking area at the junction of the PH16 access road and CR302 shall be improved using the following measures:

- a. Establish the boundary of parking area by placing and bedding large boulders (2-3 feet in diameter) along the entire northern edge of the pad, except where the PH16 access road is adjacent to the parking area.
- b. Control stormwater runoff from CR302 and the PH16 access road by constructing a ditch along the edge of the parking area and installing a sediment trap at the northwestern end of the parking area.
- c. Install a minimum 24-inch-diameter culvert in the stormwater ditch crossing under the PH16 access road.
- d. Blade the parking area to direct runoff into the ditch to be constructed along the northern edge of the parking area and lay down a minimum 4-inch lift of gravel across the entire parking area (size of rock to be determined).

Culvert Installations. The two ditch crossings planned for culvert installations along the PH16 road shall be minimum 48-inch diameter unless otherwise approved by the Authorized Officer. The pipeline installation through these crossings shall be trenched and bedded prior to road construction and culvert installation. The disturbance corridor at these crossings shall not exceed 30 feet in total disturbance width to protect riparian vegetation and/or historic ditch characteristics. A flume shall be placed in the ditch should running water be present or occur during installation to direct flows through the work area. Furthermore, pre-and post-construction photos shall be taken of the ditch crossings to determine the extent of surface disturbance and completion of mitigation measures related to the historic ditches.

Site-Specific COAs Applicable to Pad PI16

In addition to the standard Surface Use Conditions of Approval, the following Site-specific Conditions of Approval shall apply to the PI16 pad:

Weed Control. Prior to pad construction, the Russian knapweed on the southwestern corner of PI16 shall be treated, if timing is appropriate, and the perimeter of the knapweed infestation shall be flagged by the GSEO Ecologist. During the pre-construction meeting, if it is determined that the knapweed lies within the proposed disturbance, the topsoil from this area shall be isolated to prevent spreading weed propagules and seeds across the disturbed area.

Parking Area Improvements. The existing parking area at the junction of the PH16 access road and CR302 shall be improved using the following measures:

- a. Establish the boundary of parking area by placing and bedding large boulders (2-3 feet in diameter) along the entire northern edge of the pad, except where the PH16 access road is adjacent to the parking area.
- b. Control stormwater runoff from CR302 and the PH16 access road by constructing a ditch along the edge of the parking area and installing a sediment trap at the northwestern end of the parking area.
- c. Install a minimum 24-inch-diameter culvert in the stormwater ditch crossing under the PH16 access road.
- d. Blade the parking area to direct runoff into the ditch to be constructed along the northern edge of the parking area and lay down a minimum 4-inch lift of gravel across the entire parking area (size of rock to be determined).

Culvert Installations. The proposed connection for the PH16/PI16 gathering line shall be buried at the existing 24" culvert location in BLM Road 8163. Prior to line trenching, the 24" culvert shall be removed and a flume shall be placed in ditch to direct flows through the work area. After the pipeline installation is complete, the culvert shall be reset in its original location and flow channel re-established to the ditch. The road and pipeline disturbance corridor at these crossings shall not exceed 30 feet in width to protect the historic ditch characteristics. Furthermore, pre-and post-construction photos shall be taken of the ditch crossing to determine the extent of surface disturbance and completion of mitigation measures related to the historic ditch. No other surface disturbance to the existing ditch is allowed.

APPENDIX C
DOWNHOLE CONDITIONS OF APPROVAL

**DOWNHOLE CONDITIONS OF APPROVAL
C0140-2008-027 EA**

PH16 Pad
CONDITIONS OF APPROVAL
APPLICATION FOR PERMIT TO DRILL

Company/Operator: **EnCana Oil & Gas (USA) Inc**

PAD: PH-16				
Well Name	Well No.	Surface Hole Location	Bottom Hole Location	Lease
Federal	15-4	SENE Sec 16 T7S, R95W	NWNW Sec 15, T7S, R95W	COC-01524
Federal	15-4BB	NENE Sec 16 T7S, R95W	NWNW Sec 15, T7S, R95W	COC-01524
Federal	15-5	SENE Sec 16 T7S, R95W	SWNW Sec 15, T7S, R95W	COC-01524
Federal	15-5BB	SENE Sec 16 T7S, R95W	SWNW Sec 15, T7S, R95W	COC-01524
Federal	16-1	NENE Sec 16 T7S, R95W	NENE Sec 16, T7S, R95W	COC-01524
Federal	16-1BB	NENE Sec 16 T7S, R95W	NENE Sec 16, T7S, R95W	COC-01524
Federal	16-8	SENE Sec 16 T7S, R95W	SENE Sec 16, T7S, R95W	COC-01524
Federal	16-8BB	SENE Sec 16 T7S, R95W	SENE Sec 16, T7S, R95W	COC-01524

NOTIFICATION REQUIREMENTS

- Location Construction - at least forty-eight (48) hours prior to construction of location and access roads.
- Spud Notice - at least twenty-four (24) hours prior to spudding the well.
- Casing String and Cementing - at least twenty-four (24) hours prior to running casing and cementing all casing strings.
- BOP and Related Equipment Tests - at least twenty-four (24) hours prior to initiating pressure tests.
- First Production-Notice within five (5) business days after new well begins, or production resumes after well has been off production for more than ninety (90) days.
- Reclamation - At least (24) hours prior to re-shaping the well pad.

For more specific details on notification requirements, please check the Conditions of Approval for Notice to Drill and Surface Use Program.

APD approval is valid for a period of two (2) year from the signature date. An extension period may be granted, if requested, prior to the expiration of the original approval period.

Please contact Steve Ficklin (970) 947-5213 of the Glenwood Springs Energy Office at least 24 hours prior to and after spud.

Please contact **Steve Ficklin (970) 947-5213** or **Ken Trueax (970) 947-5239** of the **Glenwood Springs Energy Office** at least 24 hours prior to running the surface and production casing and conducting the BOP test.

DOWNHOLE CONDITIONS OF APPROVAL FOR NOTICE TO DRILL

1. The MINIMUM TOC for the production casing needs to be **at least 200'** above the top of the Mesa Verde formation either during the primary cement job or through remedial cementing.

Well Name	Well No.	Cement TOP MD	Cement TOP TVD
Federal	15-4	4247'	4150'
Federal	15-4BB	4342'	4140'
Federal	15-5	4286'	4140'
Federal	15-5BB	4222'	4145'
Federal	16-1	4234'	4150'
Federal	16-1BB	4159'	4140'
Federal	16-8	4172'	4140'
Federal	16-8BB	4264'	4125'

2. A cement bond log (CBL) will be run from the production casing shoe to **TOC** and shall be utilized to determine the bond quality for the production casing.
3. Any usable water zones encountered below the surface casing shall be isolated and or protected by cementing across the zone. The minimum requirement is to cement from 50 feet above to 50 feet below each usable water zone encountered. Contact BLM – Glenwood Springs, CO upon encountering any usable water zones.
4. In addition to the Onshore Order No. 2 BOP testing requirements, for safety concerns, please test BOP to 250 psi for 5 minutes.
5. **All casing strings below the conductor** shall be pressure tested to 0.22 psi per foot of casing string length or **1500** psi, whichever is greater, but not to exceed 70 percent of the minimum internal yield. If pressure declines more than 10 percent in 30 minutes, corrective action shall be taken.
6. In accordance with 43-CFR 3162.4(b) submit a complete set of electrical/mechanical logs in **.LAS** format with standard Form 3160-4, Well Completion or Recompletion Report and Log. Please contact Karen Conrath, (970) 947-5235 (karen_conrath@blm.gov), for further clarification.

REGULATORY REMINDERS

Approval of this application does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.

All drilling operations, unless otherwise specifically approved in the APD, must be conducted in accordance with Onshore Oil and Gas Order No. 2.

All lease and/or unit operations will be conducted in such a manner that full compliance is made with applicable laws, regulations (43 CFR 3100), Onshore Oil and Gas Orders, and the approved plan of operations. The operator is fully responsible for the actions of his subcontractors.

A copy of the approved application for permit to drill (APD), including the conditions of approval and accompanying surface use plan will be furnished to the field representative by the operator to insure compliance and will be available to authorized personnel at the drillsite whenever active construction or drilling operations are underway.

Be aware fire restrictions may be in effect when location is being constructed and/or when well is being drilled. Contact the appropriate Surface Management Agency for information.

Section 102(b)(3) of the Federal Oil and Gas Royalty Management Act of 1982, as implemented by the applicable provisions of the operating regulations at Title 43 CFR 3162.4-1(c), requires that "not later than the 5th business day after any well begins production on which royalty is due anywhere on a lease site or allocated to a lease site, or resumes production in the case of a well which has been off production for more than 90 days, the operator shall notify the authorized officer by letter or sundry notice, Form 3160-5, or orally to be followed by a letter or sundry notice, of the date on which such production has begun or resumed."

If you fail to comply with this requirement in the manner and time allowed, you shall be liable for a civil penalty of up to \$10,000 per violation for each day such violation continues, not to exceed a maximum of 20 days. See Section 109(c)(3) of the Federal Oil and Gas Royalty Management Act of 1982 and the implementing regulations at Title 43 CFR 3162.4-1(b)(5)(ii).

In the event after-hours approval or notification is necessary, please contact one of the following individuals:

Marty O'Mara	C: 970.319.5837
Petroleum Engineer	W: 970.947.5221

Ken Trueax	W: 970.947.5239
Petroleum Engineering Tech.	

Steve Ficklin	W: 970.947.5213
Lead Petroleum Eng Tech.	C: 970.319.2509

BLM Fax: 970.947.5267

EPA'S LIST OF NONEXEMPT EXPLORATION AND PRODUCTION WASTES

While the following wastes are nonexempt, they are not necessarily hazardous.

- Unused fracturing fluids or acids
- Gas plant cooling tower cleaning wastes
- Painting wastes
- Oil and gas service company wastes, such as empty drums, drum rinsate, vacuum truck rinsate, sandblast media, painting wastes, spent solvents, spilled chemicals, and waste acids
- Vacuum truck and drum rinsate from trucks and drums, transporting or containing nonexempt waste
- Refinery wastes
- Liquid and solid wastes generated by crude oil and tank bottom reclaimers
- Used equipment lubrication oils
- Waste compressor oil, filters, and blowdown
- Used hydraulic fluids
- Waste solvents
- Waste in transportation pipeline-related pits
- Caustic or acid cleaners
- Boiler cleaning wastes
- Boiler refractory bricks
- Incinerator ash
- Laboratory wastes
- Sanitary wastes
- Pesticide wastes
- Radioactive tracer wastes
- Drums, insulation and miscellaneous solids.

PI16 Pad
CONDITIONS OF APPROVAL
APPLICATION FOR PERMIT TO DRILL

Company/Operator: **EnCana Oil & Gas (USA) Inc**

PAD: PI-16				
Well Name	Well No.	Surface Hole Location	Bottom Hole Location	Lease
Federal	15-12	NESE Sec 16 T7S, R95W	NWSW Sec 15, T7S, R95W	COC-01524
Federal	15-12BB	NESE Sec 16 T7S, R95W	NWSW Sec 15, T7S, R95W	COC-01524
Federal	16-9	NESE Sec 16 T7S, R95W	NESE Sec 16, T7S, R95W	COC-01524
Federal	16-9BB	NESE Sec 16 T7S, R95W	NESE Sec 16, T7S, R95W	COC-01524
Federal	16-16	NESE Sec 16 T7S, R95W	SESE Sec 16, T7S, R95W	COC-01524
Federal	16-16BB	NESE Sec 16 T7S, R95W	SESE Sec 16, T7S, R95W	COC-01524

NOTIFICATION REQUIREMENTS

- Location Construction - at least forty-eight (48) hours prior to construction of location and access roads.
- Spud Notice - at least twenty-four (24) hours prior to spudding the well.
- Casing String and Cementing - at least twenty-four (24) hours prior to running casing and cementing all casing strings.
- BOP and Related Equipment Tests - at least twenty-four (24) hours prior to initiating pressure tests.
- First Production-Notice within five (5) business days after new well begins, or production resumes after well has been off production for more than ninety (90) days.
- Reclamation - At least (24) hours prior to re-shaping the well pad.

For more specific details on notification requirements, please check the Conditions of Approval for Notice to Drill and Surface Use Program.

APD approval is valid for a period of two (2) year from the signature date. An extension period may be granted, if requested, prior to the expiration of the original approval period.

Please contact Steve Ficklin (970) 947-5213 of the Glenwood Springs Energy Office at least 24 hours prior to and after spud.

Please contact **Steve Ficklin (970) 947-5213 or Ken Trueax (970) 947-5239 of the Glenwood Springs Energy Office** at least 24 hours prior to running the surface and production casing and conducting the BOP test.

DOWNHOLE CONDITIONS OF APPROVAL FOR NOTICE TO DRILL

1. The MINIMUM TOC for the production casing needs to be **at least 200'** above the top of the Mesa Verde formation either during the primary cement job or through remedial cementing.

Well Name	Well No.	Cement TOP MD	Cement TOP TVD
Federal	15-12	4230'	4055'
Federal	15-12BB	4191'	4055'
Federal	16-9	4032'	4025'
Federal	16-9BB	4103'	4030'
Federal	16-16	4194'	4025'
Federal	16-16BB	4367'	4025'

2. A cement bond log (CBL) will be run from the production casing shoe to **TOC** and shall be utilized to determine the bond quality for the production casing.
3. Any usable water zones encountered below the surface casing shall be isolated and or protected by cementing across the zone. The minimum requirement is to cement from 50 feet above to 50 feet below each usable water zone encountered. Contact BLM – Glenwood Springs, CO upon encountering any usable water zones.
6. In addition to the Onshore Order No. 2 BOP testing requirements, for safety concerns, please test BOP to 250 psi for 5 minutes.
7. **All casing strings below the conductor** shall be pressure tested to 0.22 psi per foot of casing string length or **1500** psi, whichever is greater, but not to exceed 70 percent of the minimum internal yield. If pressure declines more than 10 percent in 30 minutes, corrective action shall be taken.
6. In accordance with 43-CFR 3162.4(b) submit a complete set of electrical/mechanical logs in **.LAS** format with standard Form 3160-4, Well Completion or Recompletion Report and Log. Please contact Karen Conrath, (970) 947-5235 (karen_conrath@blm.gov), for further clarification.

REGULATORY REMINDERS

Approval of this application does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.

All drilling operations, unless otherwise specifically approved in the APD, must be conducted in accordance with Onshore Oil and Gas Order No. 2.

All lease and/or unit operations will be conducted in such a manner that full compliance is made with applicable laws, regulations (43 CFR 3100), Onshore Oil and Gas Orders, and the approved plan of operations. The operator is fully responsible for the actions of his subcontractors.

A copy of the approved application for permit to drill (APD), including the conditions of approval and accompanying surface use plan will be furnished to the field representative by the operator to insure compliance and will be available to authorized personnel at the drillsite whenever active construction or drilling operations are underway.

Be aware fire restrictions may be in effect when location is being constructed and/or when well is being drilled. Contact the appropriate Surface Management Agency for information.

Section 102(b)(3) of the Federal Oil and Gas Royalty Management Act of 1982, as implemented by the applicable provisions of the operating regulations at Title 43 CFR 3162.4-1(c), requires that "not later than the 5th business day after any well begins production on which royalty is due anywhere on a lease site or allocated to a lease site, or resumes production in the case of a well which has been off production for more than 90 days, the operator shall notify the authorized officer by letter or sundry notice, Form 3160-5, or orally to be followed by a letter or sundry notice, of the date on which such production has begun or resumed."

If you fail to comply with this requirement in the manner and time allowed, you shall be liable for a civil penalty of up to \$10,000 per violation for each day such violation continues, not to exceed a maximum of 20 days. See Section 109(c)(3) of the Federal Oil and Gas Royalty Management Act of 1982 and the implementing regulations at Title 43 CFR 3162.4-1(b)(5)(ii).

In the event after-hours approval or notification is necessary, please contact one of the following individuals:

Marty O'Mara	C: 970.319.5837
Petroleum Engineer	W: 970.947.5221

Ken Trueax	W: 970.947.5239
Petroleum Engineering Tech.	

Steve Ficklin	W: 970.947.5213
Lead Petroleum Eng Tech.	C: 970.319.2509

BLM Fax: 970.947.5267

EPA'S LIST OF NONEXEMPT EXPLORATION AND PRODUCTION WASTES

While the following wastes are nonexempt, they are not necessarily hazardous.

- Unused fracturing fluids or acids
- Gas plant cooling tower cleaning wastes
- Painting wastes
- Oil and gas service company wastes, such as empty drums, drum rinsate, vacuum truck rinsate, sandblast media, painting wastes, spent solvents, spilled chemicals, and waste acids
- Vacuum truck and drum rinsate from trucks and drums, transporting or containing nonexempt waste
- Refinery wastes
- Liquid and solid wastes generated by crude oil and tank bottom reclaimers
- Used equipment lubrication oils
- Waste compressor oil, filters, and blowdown
- Used hydraulic fluids
- Waste solvents
- Waste in transportation pipeline-related pits
- Caustic or acid cleaners
- Boiler cleaning wastes
- Boiler refractory bricks
- Incinerator ash
- Laboratory wastes
- Sanitary wastes
- Pesticide wastes
- Radioactive tracer wastes
- Drums, insulation and miscellaneous solids.