

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

ENVIRONMENTAL ASSESSMENT

NUMBER: DOI-BLM-CO-N040-2010-0065-EA

CASEFILE NUMBER: Federal Lease COC019572.

PROJECT NAME: Proposal to Drill 15 Wells from the Proposed PJ19 Pad on Private Surface-Federal Minerals in the South Parachute Area south of Battlement Mesa, Colorado.

LEGAL DESCRIPTION: Township 7 South (T7S), Range 95 West (R95W), Section 19, NW¼ SE¼, Sixth Principal Meridian. See Table 1 for list of surface hole and bottomhole footages for the planned wells on the PJ19 pad.

APPLICANT: EnCana Oil & Gas (USA) Inc., Contact: Deanne Spector, 370 Seventeenth Street, Suite 1700, Denver, CO 80202.

PROPOSED ACTION:

EnCana Oil & Gas (USA) Inc. (“EnCana”) proposes to drill and develop 15 new oil and gas wells from the proposed PJ19 well pad located on private property owned by Daybreak Realty with underlying 50% Federal-50% Fee mineral estate (Federal lease COC019572). No public access available to the site, as the existing road crosses private lands at its juncture with Garfield County Road 300 (CR300). The private road provides adequate truck access to the site with the proposed construction of an additional 220 feet of spur road to the pad. The proposed pad would be located approximately 1400 feet south of CR300 and the community of Battlement Mesa (Figure 1). Approximately 110 feet of steel gas pipeline would be buried from the pad to the existing gas gathering pipeline.

The PJ19 pad would be located on a gentle north-facing aspect between two ephemeral drainages with a third gulch being redirected around the proposed pad footprint with a constructed channel (Figure 2). The pad would lie directly north and downslope of the existing access road with the northern extent of the pad disturbance occurring near Public Service Company of Colorado (PSCo) overhead electrical transmission lines. A portion of the pad would be situated within the juniper woodlands vegetation community and associated shrubs and grasses, while the most of the pad would set within an open grass-shrub community that has recovered from the 1987 Battlement Mesa wildfire. The proposed developments would be visible from CR300, although design features would be implemented during pad construction and the follow-up interim reclamation work to shield the pad and its working components from a casual observer’s view. The proposed pad site currently lies within a horse pasture used by the surface owner.

The 15 proposed wells would be directionally drilled and completed using closed loop drilling techniques. A reserve pit would not be constructed or used on the pad to deposit drill cuttings. With closed loop drilling, fluids are recovered and reused in the drilling while cuttings are processed through a shaker system achieving a drier, more manageable consistency. These cuttings are then typically collected in a mixing pit on the pad and incorporated with a drying agent that allows the treated cuttings to be placed or stacked on the pad preferably against the pad cut slope.

Table 1. PJ19 Well Locations

<u>TOP HOLE FOOTAGES</u>	<u>BOTTOM HOLE FOOTAGES</u>
DAYBREAK FEDERAL 19-8BB (PJ-19) <u>2052' FSL & 2323' FEL</u>	DAYBREAK FEDERAL 19-8BB (PJ-19) <u>2420' FNL & 642' FEL SEC. 19</u>
DAYBREAK FEDERAL 19-8D (PJ-19) <u>2047' FSL & 2340' FEL</u>	DAYBREAK FEDERAL 19-8D (PJ-19) <u>2072' FNL & 649' FEL SEC. 19</u>
DAYBREAK FEDERAL 19-8C (PJ-19) <u>2041' FSL & 2356' FEL</u>	DAYBREAK FEDERAL 19-8C (PJ-19) <u>1322' FNL & 642' FEL SEC. 19</u>
DAYBREAK FEDERAL 19-7C (PJ-19) <u>2035' FSL & 2372' FEL</u>	DAYBREAK FEDERAL 19-7C (PJ-19) <u>1920' FNL & 1992' FEL SEC. 19</u>
DAYBREAK FEDERAL 19-2D (PJ-19) <u>2029' FSL & 2388' FEL</u>	DAYBREAK FEDERAL 19-2D (PJ-19) <u>1181' FNL & 1961' FEL SEC. 19</u>
DAYBREAK FEDERAL 19-3BB (PJ-19) <u>2023' FSL & 2405' FEL</u>	DAYBREAK FEDERAL 19-3BB (PJ-19) <u>1000' FNL & 1938' FWL SEC. 19</u>
DAYBREAK FEDERAL 19-6 (PJ-19) <u>2017' FSL & 2421' FEL</u>	DAYBREAK FEDERAL 19-6 (PJ-19) <u>1763' FNL & 1946' FWL SEC. 19</u>
DAYBREAK FEDERAL 19-6BB (PJ-19) <u>2012' FSL & 2437' FEL</u>	DAYBREAK FEDERAL 19-6BB (PJ-19) <u>2503' FNL & 1945' FWL SEC. 19</u>
DAYBREAK FEDERAL 19-8 (PJ-19) <u>2057' FSL & 2334' FEL</u>	DAYBREAK FEDERAL 19-8 (PJ-19) <u>1709' FNL & 649' FEL SEC. 19</u>
DAYBREAK FEDERAL 19-10A (PJ-19) <u>2051' FSL & 2350' FEL</u>	DAYBREAK FEDERAL 19-10A (PJ-19) <u>2701' FSL & 1975' FEL SEC. 19</u>
DAYBREAK FEDERAL 19-7 (PJ-19) <u>2045' FSL & 2366' FEL</u>	DAYBREAK FEDERAL 19-7 (PJ-19) <u>2267' FNL & 1993' FEL SEC. 19</u>
DAYBREAK FEDERAL 19-7BB (PJ-19) <u>2040' FSL & 2383' FEL</u>	DAYBREAK FEDERAL 19-7BB (PJ-19) <u>1527' FNL & 1976' FEL SEC. 19</u>
DAYBREAK FEDERAL 19-2 (PJ-19) <u>2034' FSL & 2399' FEL</u>	DAYBREAK FEDERAL 19-2 (PJ-19) <u>810' FNL & 2000' FEL SEC. 19</u>
DAYBREAK FEDERAL 19-6C (PJ-19) <u>2028' FSL & 2415' FEL</u>	DAYBREAK FEDERAL 19-6C (PJ-19) <u>1385' FNL & 1953' FWL SEC. 19</u>
DAYBREAK FEDERAL 19-6D (PJ-19) <u>2022' FSL & 2431' FEL</u>	DAYBREAK FEDERAL 19-6D (PJ-19) <u>2125' FNL & 1992' FWL SEC. 19</u>

The planned surface disturbance for the pad (5.3 acres) combined with the 50-foot by 280-foot road-pipeline corridor (0.3 acre) would result in a short-term total disturbance of 5.6 acres on private land. After the pad and pipeline are reclaimed, the expected long-term disturbance during the 30-year life of the producing wells would amount to 1.6 acres. No surface disturbance on public lands is planned.

The road, pipeline, and pad construction work would follow the guidelines established in the BLM Gold Book, *Surface Operating Standards for Oil and Gas Exploration and Development* (BLM 2007). A road maintenance program would be required during the production phase of the wells which includes, but is not limited to blading, ditching, culvert installation and cleanout, weed control, and gravel surfacing where excessive rutting or erosion may occur. Roads would be maintained in a safe and usable condition.

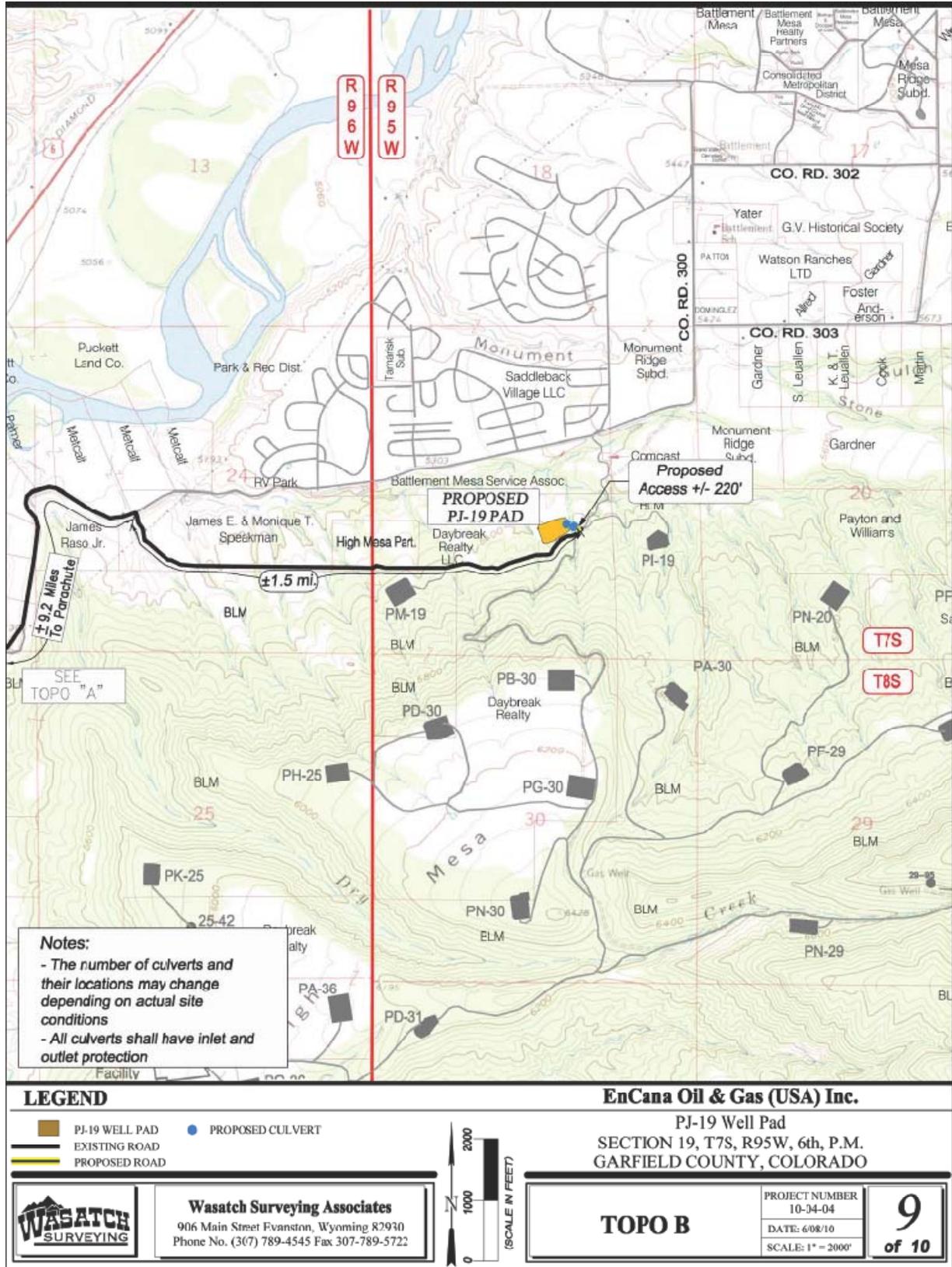


Figure 1. PJ19 Project Location

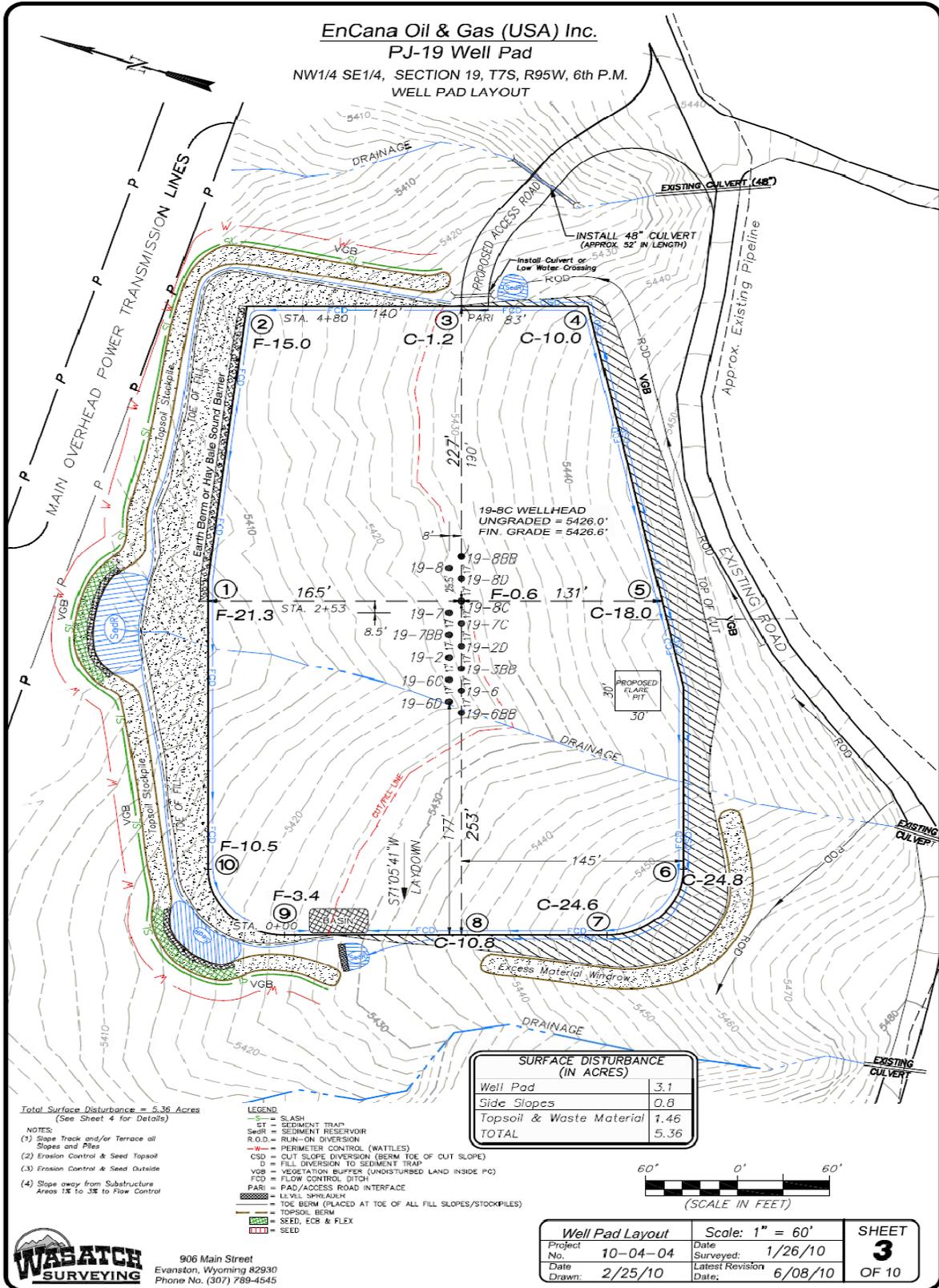


Figure 2. Proposed PJ19 Pad Layout

The Proposed Action would include drilling and completion operations, production of natural gas and associated liquid condensate, proper handling and disposal of produced water, and interim and final reclamation. The Proposed Action would be implemented consistent with Federal oil and gas lease, Federal regulations (43 CFR 3100), and the operational measures included in the Applications for Permit to Drill (APDs). Appendix A lists the specific Surface Use Conditions of Approval that would be implemented as mitigation measures for this project. The operator would be responsible for continuous inspection and maintenance of the access road, pad and pipeline.

NO ACTION ALTERNATIVE:

The Proposed Action involves Federal subsurface minerals encumbered with Federal oil and gas leases that 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 15 Federal APDs described in the Proposed Action and any of the associated upgrades to the pad, road, and pipeline. No new surface disturbance on private land would occur under the No Action alternative.

SUMMARY OF LEASE STIPULATIONS:

The 15 Federal wells would be directionally drilled from the proposed PJ19 pad located on private surface owned by Daybreak Realty into the underlying Federal lease COC019572 (50% Federal/50% Fee). Although no special stipulations or notices are included on this lease, any protective measures deemed appropriate by the Authorized Officer could be applied to the developments in the Proposed Action through the application of Conditions of Approval (COAs) on individual APDs. Appendix A lists site-specific COAs developed during the APD/EA review and onsite consultation with the operator.

LAND USE PLAN CONFORMANCE REVIEW:

The Proposed Action and No Action alternative are subject to and have been reviewed for conformance with the following plan (43 CFR 1610.5, BLM 1617.3):

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

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

Discussion: The Proposed Action is in conformance with the 1991 and 1999 RMP amendments cited above because the Federal mineral estate proposed for development is open to oil and gas leasing and development. The 1999 RMP amendment requires multi-year development plans known at that time as Geographic Area Plans (GAPs) for lease development over a large geographic area. However, the 1999

RMP amendment also provides exceptions to that requirement for individual or small groups of exploratory wells drilled in relatively undrilled areas outside known high production areas. The Proposed Action, as such, is in conformance with the exception to the requirement to require operators to submit Master Development Plans (MDPs), previously known as Geographic Area Plans (GAPs).

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 impacts resulting from the Proposed Action or alternatives being analyzed 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). These analyses are presented below.

AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES:

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

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

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

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.

CRITICAL ELEMENTS

Air Quality

Affected Environment

Colorado Ambient Air Quality Standards (CAAQS) and National Ambient Air Quality Standards (NAAQS) are health-based criteria for the maximum acceptable concentrations of air pollutants in areas of public use. Although specific air quality monitoring has not been conducted within the project area, regional air quality monitoring has been conducted in Rifle and elsewhere in Garfield County. Air pollutants measured in the region for which ambient air quality standards exist include: carbon monoxide (CO), nitrogen dioxide (NO₂), ozone (O₃), particulate matter less than 10 microns (μ) in diameter (PM₁₀) and less than 2.5 μ in diameter (PM_{2.5}), and sulfur dioxide (SO₂).

The project area lies within Garfield County, which has been described as an attainment area under CAAQS and NAAQS. An attainment area is an area where ambient air pollution quantities are below (i.e., better than) NAAQS standards. As shown in Table 3, regional background values are well below established standards, and all areas within the cumulative study area are designated as attainment for all criteria pollutants.

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

The surrounding areas are classified as PSD Class II. The PSD Class I areas within 100 miles of the project area are the Flat Tops Wilderness (45 miles NE), Maroon Bells–Snowmass Wilderness (50 miles SE), West Elk Wilderness (60 miles SE), Black Canyon of the Gunnison National Park (45 miles S), Eagles Nest Wilderness (90 miles E), and Arches National Park (65 miles SW). Dinosaur National Monument (55 miles NW) is listed as a Federal Class II area, but is regulated as a Class I area for SO₂ by CDPHE. These sensitive areas have the potential to be impacted by cumulative project source emissions. Regional background pollutant concentrations and NAAQS, CAAQS, and PSD Class I and II increments are also presented in Table 3.

Environmental Consequences

Proposed Action

CDPHE, under its EPA-approved State Implementation Plan (SIP), is the primary air quality regulatory agency responsible for determining potential impacts once detailed industrial development plans have been made; those development plans are subject to applicable air quality laws, regulations, standards, control measures, and management practices. Therefore, CDPHE has the ultimate responsibility for reviewing and permitting any project's air quality impacts prior to its operation. Unlike the conceptual "reasonable but conservative" engineering designs used in NEPA analyses, any CDPHE air quality preconstruction permitting required would be based on site-specific, detailed engineering values, which would be assessed in CDPHE's review of the permit application.

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

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

Air quality would decrease during construction of the PJ19 road spur, pad, wells, and pipeline connection. Pollutants generated during these activities would include combustion emissions and fugitive dust associated with construction equipment and vehicles. Construction activities would occur between 7:00 a.m. and 6:00 p.m. each day for a period of approximately two weeks. Construction of the road, pad and pipeline would take 2 to 3 weeks; much of this construction would occur concurrently. Once construction activities are complete, air quality impacts associated with these activities would also cease.

Volatile organic compound (VOC) emissions are dependent on the characteristics of the condensate, tank operations, and production. The air impacts associated with the condensate tanks are anticipated to be minor, but VOC emissions would be controlled as required under CDPHE Regulation 7. If deemed necessary by the State, EnCana may need to install a vapor recovery or thermal destruction system to reduce VOC concentrations.

The Roan Plateau RMPA and EIS describes potential effects from oil and gas development (BLM 2006a:4-26 to 4-37). Analysis was completed with regard to greenhouse gas emissions, a near-field and far-field analysis for “criteria pollutants” (particulate matter [PM₁₀ and PM_{2.5}], carbon monoxide, sulfur dioxide, and nitrogen oxides) and hazardous air pollutants (benzene, ethylbenzene, formaldehyde, hydrogen sulfide, toluene, and xylenes). Sulfur and nitrogen deposition, acid neutralizing capacity, and a visibility screening analysis were also completed in the Roan Plateau RMPA and EIS. Because the visibility screening analysis showed potential impacts at one or more Class I areas, a refined visibility analysis was also completed. The refined visibility analysis indicated a “just noticeable” impact on visibility for one day each at two Class I areas (Black Canyon of the Gunnison National Park and the Mt. Zirkel Wilderness). For the other pollutants analyzed, implementation of oil and gas development under the Roan Plateau RMPA and EIS was projected to have no or negligible long-term adverse impacts on air quality. Since the Proposed Action is within the scale of development anticipated in the cumulative

impacts analysis of the Roan plan, it is anticipated that the Proposed Action would not cause air quality impacts beyond those already analyzed and disclosed.

Activities described in the Proposed Action would result in localized short-term increases in exhaust emissions from vehicles and drilling equipment and fugitive dust emissions from construction and use of the well pad and access road. Concentrations would be below applicable ambient air quality standards as analyzed in the Roan Plateau RMPA and EIS. However, it is anticipated that construction, drilling, and production activities would produce high levels of fugitive 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). Additionally, the operator would be required to apply gravel to the access road to a compacted depth of 6 inches, further reducing fugitive dust emissions (Appendix A).

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

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

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

No Action Alternative

Under the No Action alternative, the project components included in the Proposed Action would not be approved and constructed. Therefore, emissions of pollutants from vehicle and equipment engines or of fugitive dust from disturbed surfaces that would accompany the Proposed Action would not occur.

Cultural Resources

Affected Environment

Seven Class III cultural resource investigations (intensive pedestrian inventories) identified as GSFO# 5410-6, 5407-14, 14606-2, 14606-3, 5405-13, 1287 and 902 have been conducted in the proposed PJ19

pad project area or vicinity. Within the area inventoried for this project, no cultural resources recommended as “historic properties” were identified. “Historic properties” are cultural resources that are eligible or potentially eligible for inclusion on the National Register of Historic Properties (NRHP). One prehistoric Isolated Find was recorded, but isolated finds by definition are not eligible for inclusion on the NRHP.

Environmental Consequences

Proposed Action

The implementation of the Proposed Action would have no direct impacts to known “historic properties” as none were discovered during cultural inventories of the project area. Therefore, the BLM made a determination of “**No Historic Properties Affected.**” This determination was made in accordance with the 2001 revised regulations [36CFR 800.4(d)(1)] for Section 106 of the National Historic Preservation Act (16U.S.C 470f), the BLM/State Historic Preservation Officer (SHPO) Programmatic Agreement (1997) and Colorado Protocol (1998)]. Therefore, no formal consultation was initiated with the SHPO.

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). The importance of this COA should be stressed to the operator and its contractors, including informing them of their responsibilities to protect and report any cultural resources encountered during construction, drilling, completion, and maintenance operations.

No Action Alternative

The No Action alternative constitutes denial of the 15 Federal APDs described in the Proposed Action and any of the associated upgrades to the pad, road, and pipeline. No new surface disturbance on private land would occur under the No Action alternative .

Invasive Non-native Species

Affected Environment

A large portion of the project area was burned in the 1987 Battlement Mesa fire. This area contains a high density of two non-native weeds: an annual grass (cheatgrass, *Anisantha tectorum*) and a perennial forb (field bindweed, *Convolvulus arvensis*). Other prevalent weeds in the area include two annual forbs: tall tumble-mustard (*Sisymbrium altissimum*) and salsify (*Tragopogon dubius*).

Environmental Consequences

Proposed Action

Surface-disturbing activities provide a niche for the invasion and establishment of invasive non-native species, particularly when these species are already present in the surrounding area. Because 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 APDs as conditions of approval (see Appendix A).

No Action Alternative

Under the No Action alternative, none of the proposed ground disturbance on Fee land would occur so the potential for weed invasion would be much less than under the Proposed Action; however, invasive, non-native species already present in the project area would spread if left untreated.

Migratory Birds

Affected Environment

The project area consists primarily of pinyon-juniper woodlands and sagebrush shrublands that provide habitat and/or potential habitat for numerous migratory birds, including species identified listed by the U.S. Fish and Wildlife Service (USFWS 2008) as Birds of Conservation Concern (BCC).

Species on the BCC list that may be present in pinyon-juniper woodlands in the area include the pinyon jay (*Gymnorhinus cyanocephalus*) and juniper titmouse (*Baeolophus griseus*). Other species associated with this habitat type include Neotropical migrants such as the broad-tailed hummingbird (*Selasphorus platycercus*), black-chinned hummingbird (*Archilochus alexandri*), western kingbird (*Tyrannus verticalis*), Say's phoebe (*Sayornis saya*), gray flycatcher (*Empidonax oberholseri*), mountain bluebird (*Sialia sialis*), plumbeous vireo (*Vireo plumbeus*), black-throated gray warbler (*Dendroica nigrescens*), chipping sparrow (*Spizella passerina*), lark sparrow (*Chondestes grammacus*), and lesser goldfinch (*Spinus psaltria*).

Sagebrush habitats may support one BCC species, Brewer's sparrow (*Spizella breweri*), as well as other migrants such as the vesper sparrow (*Pooecetes gramineus*). Based on the extent and quality of the sagebrush, the habitat is marginal for Brewer's sparrow and apparently unsuitable for another sagebrush obligate, the sage sparrow (*Amphispiza bellii*).

A raptor survey completed in April 2010 resulted in no active or inactive raptor nests being found within 0.25 mile of the proposed development. A raptor species on the BCC list and known to exist in the area is the golden eagle (*Aquila chrysaetos*). Another BCC species, the flammulated owl (*Otus flammeolus*), is less likely to occur but potentially present in pinyon-juniper. Migratory raptors not on the BCC list but present in the area include the turkey vulture (*Cathartes aura*), American kestrel (*Falco sparverius*), and Swainson's hawk (*Buteo swainsoni*).

Environmental Consequences

Proposed Action

The Proposed Action would result in a loss of nesting, roosting, perching, and foraging habitat for migratory birds on disturbed areas and reduce habitat effectiveness adjacent to areas where disturbance-related effects could be expected. The construction of the well pads and access roads as well as surface facilities would remove approximately 5.6 acres of juniper and sagebrush vegetation as well as some areas of interim reclamation and would result in reduced habitat patch size. These changes to the habitat could negatively affect bird species that require large expanses of intact habitat. Habitat fragmentation could result in increased competition, increased exposure to predators, and a higher likelihood of nest parasitism. It is also possible that individual nests could be destroyed if well pads, roads, and production facilities are constructed during the nesting season.

In addition to the physical loss of habitat and habitat fragmentation, it is possible that during construction activities, individual birds could be displaced to adjacent habitats due to noise and human presence.

Effects of displacement could include increased risk of predation or failure to reproduce if adjacent habitat is at carrying capacity. Furthermore, impacts to birds at the species or local population level could include a change in abundance and composition as a result of cumulative habitat fragmentation from energy development in the larger area. Impacts to migratory bird species that nest in pinyon-juniper and sagebrush habitats can be minimized by avoiding surface-disturbing activities during the nesting season. take place outside the nesting season.

All migratory bird species are protected by the Migratory Bird Treaty Act (MBTA), which makes it unlawful to pursue, hunt, kill, capture, possess, buy, sell, purchase, or barter any migratory bird, including the feathers or other parts, nests, eggs, or migratory bird products. In addition to the MBTA, Executive Order 13186 sets forth the responsibilities of Federal agencies to further implement the provisions of the MBTA by integrating bird conservation principles and practices into agency activities and by ensuring that Federal actions evaluate the effects of actions and agency plans on migratory birds. Consistent with Executive Order 13186 and BLM Colorado guidelines, CRVFO has established a COA (Appendix A) prohibiting initiation of vegetation removal or ground-disturbing activities during the period May 15 to July 15, which is the peak period for incubation and brood rearing among migratory birds. An exception to this COA can be granted if surveys by a qualified biologist during the nesting season of BCC species potentially present indicates no active nests within 30 meters (100 feet) of the disturbance area.

Also for the protection of migratory birds is a COA specifying that any pits containing fluids be fitted with one or more devices to avoid or minimize exposure to the fluids by migratory birds (Appendix A) and the resultant potential impacts of acute toxicity or compromised insulation or buoyancy due to dissolution of protective oil on the birds' feathers.

No Action Alternative

The No Action alternative constitutes denial of the 15 Federal APDs described in the Proposed Action and any of the associated upgrades to the pad, road, and pipeline. No new surface disturbance on private land would occur under the No Action alternative, thus eliminating impacts from this development to migratory birds.

Native American Religious Concerns

Affected Environment

The proposed PJ19 pad project area is located within a larger area identified by the Ute Tribes as part of their ancestral homeland. Cultural resource inventories (see section on Cultural Resources) were conducted to determine if there were any areas that might be culturally sensitive to Native Americans. No sensitive areas were identified during the inventories and none are currently known in the proposed project area.

Environmental Consequences

Proposed Action

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 CRVFO, have indicated that they do not wish 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.

Although the Proposed Action would have no direct impacts, increased access and personnel in the vicinity of the proposed project could indirectly impact unknown Native American resources ranging from illegal collection to vandalism.

The National Historic Preservation Act (NHPA) requires that if newly discovered cultural resources are identified during project implementation, work in that area must stop and the agency Authorized Officer notified immediately (36 CFR 800.13). The Native American Graves Protection and Repatriation Act (NAGPRA), requires that if inadvertent discovery of Native American Remains or Objects occurs, activity must cease in the area of discovery, a reasonable effort made to protect the item(s) discovered, and immediate notice made to the agency Authorized Officer, as well as the appropriate Native American group(s) (IV.C.2). Notice may be followed by a 30-day delay (NAGPRA Section 3(d)). Further actions also require compliance under the provisions of NHPA and the Archaeological Resource Protection Act. EnCana will notify its staff and contractors of the requirement under the NHPA, that work must cease if cultural resources are found during project operations. A standard Education/Discovery COA for the protection of Native American values would be attached to the APDs (Appendix A). The importance of these COAs should be stressed to the operator and its contractors, including informing them of their responsibilities to protect and report any cultural resources encountered. The proponent and contractors should also be aware of requirements under the NAGPRA.

No Action Alternative

The No Action alternative constitutes denial of the 15 Federal APDs described in the Proposed Action and any of the associated upgrades to the pad, road, and pipeline. No new surface disturbance on private land would occur under the No Action alternative.

Special Status Species

Federally Listed, Proposed, or Candidate Plant Species

Affected Environment

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

Environmental Consequences

Proposed Action

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

No Action Alternative

Because there is no potential habitat for any Federally listed, proposed, or candidate plant species in the project area, there would be no impacts to these species from the No Action alternative.

Federally Listed, Proposed, or Candidate Animal Species

Affected Environment

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

Aquatic Vertebrates. Of the four species of Federally listed big-river fishes within the Colorado River basin, two species—the razorback sucker and Colorado pikeminnow—have Designated Critical Habitat within the Colorado River and 100-year floodplain west (downstream) from the town of State Highway 13 bridge at the town of Rifle. This portion of the Colorado River lies about 1 mile west of the project area. The nearest known habitat for the humpback chub and bonytail is within the Colorado River approximately 80 miles downstream from the project area. Only one population of humpback chub, at Black Rocks west of Grand Junction, is known in Colorado.

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

Terrestrial Vertebrates. None of the Federally listed, proposed, or candidate terrestrial wildlife species that occur or are potentially present in Garfield County is considered likely to occur in the project area or vicinity due to lack of habitat or negative results of prior surveys in potentially suitable habitat. Hence, these species are not considered further in this document. The bald eagle and peregrine falcon were removed from the listed of threatened or endangered species in August 2007 and August 1999, respectively, and are now classified by BLM as sensitive species (see below). Although no longer protected by the Endangered Species Act, both species remain protected by the Migratory Bird Treaty Act; the bald eagle is also protected by the Bald and Golden Eagle Protection Act.

Environmental Consequences

Proposed Action

Endangered Colorado River Fishes. Construction activities would increase the potential for soil erosion and sedimentation. Although a minor temporary increase in sediment transport to the Colorado River may occur, it is unlikely that the increase would be detectable above current background levels. In any case, the Federally listed, proposed, or candidate fish species associated the Colorado River are adapted to naturally high sediment loads and would not be affected. Surface runoff of pollutants from the project area also has the potential to affect Colorado River fishes. Any leaks from trucks, drilling equipment, tanks, or ancillary facilities would be likely to reach the river during runoff events. Additional potential impacts to the endangered Colorado River fishes would be associated with depletions in flows due to use of water from the Colorado River Basin in drilling, hydrostatic testing of pipelines, and dust abatement of unpaved access roads. Reductions in flows in the Colorado River and major tributaries have resulted from evaporative loss from reservoirs, withdrawals for irrigation, and other consumptive uses. These

depletions have affected minimum flows, as well as peak “flushing” flows needed to maintain suitable substrates for spawning.

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

No Action Alternative

The No Action alternative constitutes denial of the 15 Federal APDs described in the Proposed Action and any of the associated upgrades to the pad, road, and pipeline. No new surface disturbance on private land would occur under the No Action alternative, thus eliminating impacts from this development to Federally listed, proposed, or candidate animal species.

BLM Sensitive Plant Species

Affected Environment

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

Environmental Consequences

Proposed Action

Results of a June 2010 plant inventory indicate the project area contains potential habitat for Harrington’s penstemon, but surveys failed to identify any plants of this species. Therefore, no impacts to this species are anticipated. There was no potential habitat for any other BLM sensitive plant species in the project area.

No Action Alternative

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

BLM Sensitive Animal Species

Affected Environment

BLM sensitive animal species with habitat and/or occurrence records in the portion of the CRVFO that includes the project area and vicinity are listed in Table 4.

Table 4. Special Status Wildlife Species Present or Potentially Present in the Project Area		
<i>Common Name</i>	<i>Habitat</i>	<i>Potential for Occurrence</i>
Fringed myotis	Breeds and roosts in caves, trees, mines, and buildings; hunts over pinyon-juniper, montane conifer, and semi-desert shrubland habitats.	Possible
Townsend's big-eared bat	Breeds and roosts in caves, trees, mines, and buildings; hunts over pinyon-juniper, montane conifer, and semi-desert shrubland habitats.	Possible
Peregrine falcon	Nests on high cliffs and hunts along rivers and lakes for waterfowl.	Present on cliffs near Anvil Points
Northern goshawk	Predominantly uses spruce/fir forests but also uses Douglas-fir, various pines, and aspens.	Possible winter visitor
Bald eagle	Nests and roosts in mature cottonwood forests along rivers, large streams, and lakes.	Present along Colorado River
Brewer's sparrow	Sagebrush shrublands, mountain parks; may be found in alpine willow stands.	Present
Midget faded rattlesnake	High, cold desert dominated by sagebrush and with an abundance of rock outcrops and exposed canyon walls.	Possible – Known historical location
Northern leopard frog	Wet meadows and the shallows of marshes, ponds, lakes, streams, and irrigation ditches.	Unlikely – Habitat not identified during surveys
Great Basin spadefoot	Ephemeral streams and ponds in arid environments, especially semi-desert shrublands and grasslands.	Unlikely – Habitat not identified during surveys
Flannelmouth sucker	Generally restricted to rivers and major tributaries.	Present in Colorado River
Roundtail chub	Generally restricted to rivers and major tributaries.	Present in Colorado River

Environmental Consequences

Proposed Action

For the sensitive species listed in Table 4, the minor amount of direct or indirect loss of suitable habitat, the transient nature of their potential use of the area, and the brief period of construction-related activities in any given part of the project area combine to result in negligible potential for adverse impacts. The bases for this determination are summarized below. Note that another BLM sensitive species present in the CRVFO, the Colorado River cutthroat trout (*Oncorhynchus clarki pleuriticus*), is not addressed here because it does not occur in the Colorado River (the species is limited to cold, clean streams that are isolated from areas where non-native cutthroats have been stocked for recreation).

Flannelmouth Sucker and Roundtail Chub. As with the ecologically similar Colorado River endangered fishes described above, the flannelmouth sucker (*Catostomus discobolus*) and roundtail chub (*Gila robusta*) are adapted to naturally high sediment loads and therefore would not be affected by increased

sediment transport to the Colorado River. Furthermore, protective COAs for water quality would minimize this potential (Appendix A). However, these species are vulnerable to alterations in flow regimes in the Colorado River (including evaporative losses from dams and depletions from withdrawal of water for irrigation or municipal water supplies) that affect the presence of sandbars and seasonally flooded overbank areas needed for reproduction.

Great Basin Spadefoot. This spadefoot (*Spea intermontana*) is generally found in seasonal streams and ponds, and occasionally in permanent waters lacking fish, in semi-arid or arid environments dominated by grasses or shrubs. The project vicinity appears potentially suitable for this species, but no historic occurrences are known in the area, and most occurrences are farther to the west. Like true toads (*Bufo*), which they resemble, spadefoots emerge from aestivation or hibernation in the substrate of the seasonal waters long enough to breed. Unlike true frogs (*Rana*), they do not require permanent water, nor are they as sensitive to water quality.

Northern Leopard Frog. The northern leopard frog (*Rana pipiens*) is not known to occur in the project area. This species requires permanent ponds, lake shores, or slow-flowing streams with good water quality and an abundance of aquatic plants. If it were to occur in the project area, the northern leopard frog would be vulnerable to habitat loss or degradation from inflow of sediments that decrease water quality for reproduction and for survival of aquatic plants. The protective COAs for water quality in Appendix A would minimize this potential.

Midget Faded Rattlesnake. This small viper, *Crotalus viridis concolor*, is generally considered a small, pale-colored subspecies of the common and widespread western (prairie) rattlesnake, although some authorities consider it and another western subspecies, the Great Basin rattlesnake (*C.v. nuntius*) to be genetically distinct. Although movement patterns of midget faded rattlesnakes are not well known, they are believed to be limited to a few hundred meters from den sites. The limited distribution and small home range make this snake susceptible to impacts from human disturbance (USGS 2009). Threats include direct mortality from vehicles traveling on roads and pads, off-highway vehicle use throughout the landscape, capture by collectors, and livestock grazing. As access increases into previously undeveloped areas, the risk of encounters with humans will increase, resulting in some cases of mortality or collection.

Peregrine Falcon. Peregrine falcons nest along the Roan Cliffs in the vicinity of Anvil Points and hunt for waterfowl along the Colorado River or other birds across open terrain. The cliffs north of the project area are not known to contain nests of this species, and use of the project area very unlikely, except for infrequent, transitory overflights while traveling.

Northern Goshawk. This species (*Accipiter gentilis*) is mostly limited to spruce/fir or aspen forests, such as atop the Roan Plateau, Battlement Mesa, and other areas that reach subalpine elevations. However, goshawks may migrate to lower elevation pinyon/juniper or Douglas-fir habitats during winter and therefore could make occasional, transitory use of the project area for winter foraging. Goshawks feed primarily on small birds but also on diurnal small mammals (rabbits, chipmunks, etc.).

Bald Eagle. Although bald eagles nest and roost along the Colorado River west of the project area, the potential for use of the actual project area is moderate. Any such use would most likely be by an individual hunting across large expanses of open upland habitats during winter. The project area would represent a small portion of such potential winter hunting habitat, and the reclaimed grass-forb community would provide better habitat for prey than the current shrubland types.

Brewer's Sparrow. The Brewer's sparrow is unlikely to inhabit the area, though if they are present, the 60-day TL to prohibit removal of vegetation during the period May 15 to July 15 (see Appendix A) would

avoid or minimize the potential for impacts to nesting Brewer's sparrows. Construction activities outside this period could cause individuals to avoid the disturbance while feeding. However, this impact would be limited in duration at any point along the corridor, and individuals are expected to feed across very large home ranges outside the nesting season, thus minimizing the severity of this potential indirect impact.

Fringed Myotis and Townsend's Big-eared Bat. No caves or other suitable roosting sites (including cliff overhangs and crevices) suitable for the fringed myotis (*Myotis thysanodes*) or Townsend's big-eared bat (*Corynorhinus townsendii*) occur adjacent to the site but are present in the project vicinity. Loss of habitat above which the bats could search for aerial prey would also be minimal, and disturbance due to construction activities would not occur at night when the bats are feeding. Drilling and completion activities would occur at night and could cause any bats that otherwise might use the area for hunting to avoid the site. However, it is equally possible that bats—potentially including these species—could be attracted by concentrations of aerial insects drawn to the area by the nighttime illumination.

No Action Alternative

The No Action alternative constitutes denial of the 15 Federal APDs described in the Proposed Action and any of the associated upgrades to the pad, road, and pipeline. No new surface disturbance on private land would occur under the No Action alternative, thus eliminating impacts from this development to Federally listed, proposed, or candidate animal species.

Analysis on Public Land Health Standard 4 for Special Status Species

The conclusions of the *Land Health Assessment for the Battlement Mesa Area* (BLM 2000) as related to special status species are as follows. Suitable lynx habitats for Canada lynx in the assessment area were rated as achieving Standard 3 for healthy plant and animal communities; therefore, Standard 4 was also being met for this species. For bald eagles, other raptors, and big river fishes, while site specific locations were not achieving Standard 3, the overall habitat conditions indicate that the assessment area as a whole was achieving Standard 4 for these species. Riparian habitats in the assessment area were rated as properly functioning and water quality data related to Standard 5 showed parameters to be suitable to support and sustain fish species.

The fact that special status plant species were not found in the assessment area was probably a function of the lack of potential habitat rather than any management actions that may have created unsuitable habitat conditions; therefore, it was determined that Standard 4 was being achieved for special status plants in the assessment area. However, large portions of the landscape are being fragmented due to extensive oil and gas development. Continued habitat fragmentation is of concern, because large blocks of contiguous, intact habitat are required by many species. Sustained development and the proliferation of roads, well pads, pipelines, compressor stations, tank farms and other surface facilities will continue to reduce habitat patch size and affect both habitat quality and quantity. The potential to impact some species would increase as development continues. The Proposed Action, in conjunction with similar activities throughout this watershed, would increase fragmentation and could increase sediment loads. Although the contribution of the Proposed Action would be minimal, it may further trend the area away from meeting Standard 4 for special status wildlife.

The No Action alternative would not result in a failure of the area to achieve Standard 4 because the proposed developments would not occur.

Wastes, Hazardous or Solid

Affected Environment

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

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 & Development, Draft Supplemental Environmental Impact Statement (June 1998), Appendix L, Hazardous Substance Management Plan, contains a comprehensive list of materials that are commonly used for oil and gas projects. It also includes a description of the common industry practices for use of these materials and disposal of the waste products. These practices are dictated by various Federal and State laws and regulations, and the BLM standard lease terms and stipulations that would accompany any authorization resulting from this analysis. The most pertinent of the Federal laws dealing with hazardous materials contamination are as follows:

- The Oil Pollution Act 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 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) regulates the use of hazardous substances and disposal of hazardous wastes. Note: While oil and gas lessees are exempt from RCRA, right-of-way holders are not. RCRA strictly regulates the management and disposal of hazardous wastes.

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

Environmental Consequences

Proposed Action

Possible pollutants that could be released during the construction phase of this project would include diesel fuel, hydraulic fluid, and lubricants. These materials would be used during construction of the pads, roads, and pipelines, and for refueling and maintaining equipment and vehicles. Potentially harmful substances used in the construction and operation phases would be kept onsite in limited quantities and

trucked to and from the site as required. No hazardous substance, as defined by 40 CFR 355 would be used, produced, stored, transported, or disposed of in amounts above threshold quantities.

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

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

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

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

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

No Action Alternative

Under this alternative, no new Federal wells would be drilled, the pad would not be constructed and no new surface disturbance would occur.

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

Surface Water

Affected Environment

The Proposed Action of the project area is within the Colorado River around Wallace Creek 6th-code watershed unit. The ephemeral stream that flows north of the project area drains directly into the Colorado River, approximately 1 mile west of the PJ19 pad site.

According to the *Stream Classifications and Water Quality Standards* (CDPHE, Water Quality Control Commission [WQCC] Regulation No. 37) (CDPHE 2007), the surrounding drainages are within segment 13a, which includes most tributaries to the Colorado River a point immediately below its confluence with Parachute Creek to the Colorado/Utah border. Following is a brief description of segment 13a.

- At this time, there are no water quality data Segment 13a – This segment has been classified aquatic life warm 2, recreation 1b, and agriculture. Aquatic life warm 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 1b waters are designated “potential primary contact,” where a reasonable level of inquiry has failed to identify any existing primary contact uses, but no use attainability analysis has been completed demonstrating that a class 2 (“secondary contact”) designation is appropriate. This segment is suitable or intended to become suitable for agricultural purposes that include irrigation and livestock use.

At this time, no water quality data are available for the ephemeral drainages near the PJ19 pad site. These drainages are not currently on the State of Colorado’s *Stream Classifications and Water Quality Standards List* (CDPHE, WQCC Regulation No. 37) (CDPHE 2007), the State of Colorado’s *303(d) List of Water Quality Limited Segments Requiring TMDLS* (CDPHE, WQCC Regulation No. 93) (CDPHE 2006a), or the State of Colorado’s *Monitoring and Evaluation List* (CDPHE, WQCC Regulation No. 94) (CDPHE 2006b).

The closest downstream sediment measuring station on the Colorado River is near DeBeque, Colorado. A summary of the 2 years of data collected at this station is presented in Table 5 (USGS 2007).

Table 5. Sediment Yields – USGS Station 9093700 (Colorado River near DeBeque, CO)				
<i>Maximum (tons/day)</i>	<i>Minimum (tons/day)</i>	<i>Mean (tons/day)</i>	<i>Median (tons/day)</i>	<i>Period of Record</i>
41,300	8.4	1,817.6	267	1974 – 1976
Source: USGS 2007.				

Environmental Consequences

Proposed Action

Potential impacts to surface water associated with the Proposed Action include increased erosion and sedimentation of streams due to changes in channel morphology due to road and pipeline crossings, and contamination by drilling fluids, produced water, or condensate. Surface waters would be most susceptible to sedimentation during construction, drilling, and completion activities, which would collectively last approximately 120 days. After this period, reclamation activities would substantially reduce surface exposure, decreasing the risk to surface waters over the long term.

Although surface waters would be most susceptible to sedimentation over the short-term, access roads would remain in place over the life of the well (i.e., 20 to 30 years) and would channel runoff during periods of precipitation. Sedimentation and stream channel impacts associated with roads would be reduced through the implementation of Best Management Practices (BMPs) and other preventative measures. As proposed, these measures would include limiting cut slope steepness, step-cutting, limiting

road grade to 10%, crowning road surfaces, installing culverts and drainage systems, and applying gravel to all new or upgraded BLM roads in the project area to a compacted thickness of 6 inches (Appendix A).

Other elements of the Proposed Action are designed to mitigate risks to surface waters associated with the release of drilling fluids, produced water, and condensate. A closed-loop drilling system would be implemented which recycles drilling fluids; cuttings would be dried through the use of a shaker system and be stacked against the cut slope on the pad. A traditional reserve pit would not be constructed.

Tanks used to store produced water and condensate would be placed in secondary containment to prevent offsite release. In the event of an accidental release, produced water and condensate would be confined for cleanup in a containment area and would not migrate to surrounding soils or surface waters. Pipelines associated with the transport of these liquids would be pressure tested to detect leakage prior to use. Cuttings must be decontaminated to COGCC standards prior to pit closure; the table of applicable standards can be found at http://cogcc.state.co.us/RR_docs_new/rules/900Series.pdf

Impacts to surface waters would be avoided or minimized through the use of COAs and BMPs associated with construction activities, prompt interim reclamation, and implementation of preventative measures associated with the treatment of fluids. See Appendix A.

No Action Alternative

Under the No Action alternative, the project components included in the Proposed Action would not be approved and constructed. Therefore, no impacts to surface water would accompany the Proposed Action.

Waters of the U.S.

Affected Environment

Section 404 of the Clean Water Act requires a Department of the Army permit from the U.S. 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 Department of the Army permit is required for both permanent and temporary discharges into waters of the United States.

Environmental Consequences

Proposed Action

No new crossings of Waters of the U.S. or streams that are potentially Waters of the U.S. are included in the Proposed Action, nor would any construction activities discharge fill into Waters of the U.S.

Improperly designed crossings of small ephemeral drainages, in particular undersized or poorly aligned culverts, could result in soil degradation that could include excessive erosion at culvert outlets, potentially supplying sediment to the Colorado River approximately 1 mile to the west. However, standard and site-specific surface-use COAs listed in Appendix A would be implemented to protect the Colorado River and any other waters of the U.S. that could be impacted by such long-distance stormflow transport.

No Action Alternative

Under the No Action alternative, project components included in the Proposed Action would not be approved and constructed. Therefore, no impacts to Waters of the U.S. would accompany the No Action alternative.

Groundwater

Affected Environment

Groundwater within the area of the proposed development occurs in both alluvial and sedimentary aquifers. Alluvial fresh water wells are the most productive in the region, and consist of boulders, cobbles, gravel, sand, silt, and clay. Alluvial well depths are usually less than 200 feet and water levels typically range between 100 to 150 feet. Most fresh water wells are drilled to support the rural residences and agricultural operations throughout the Piceance Basin.

Two bedrock aquifer units (upper and lower) are present within the Piceance Basin and are separated by two confining units. The upper unit is in the Uinta Formation and the upper part of the Parachute Creek Member of the Green River Formation (Robson and Saulnier 1981). The lower Piceance Basin aquifer unit is in the lower part of the Parachute Creek Member and separated from the upper unit by the Mahogany oil shale interval. South of the Colorado River, these upper Tertiary-aged aquifers have largely been eroded off, leaving isolated remnants of these formations lacking connectivity.

Beneath these two aquifer systems is a confining unit comprising the lower two members of the Green River Formation, and the Wasatch Formation, both of which are present in surface exposure. Although considered a confining unit, some fresh water wells are completed in the discontinuous water bearing sands of the Wasatch Formation. These water bearing intervals are considered to be localized, due to the lenticular nature of the strata.

Below the Wasatch Formation is the Cretaceous-aged Mesaverde aquifer. This aquifer consists of sandstone with interbedded shales and coals of the Williams Fork Formation and the marine sands and shales of the Iles Formation. The depth to the top of this aquifer beneath the project area is more than 3,000 feet below ground surface (bgs), far too deep to be considered for production. The water quality of the Mesaverde aquifer is considered poor as well, due to the minerals nahcolite (NaHCO_3 , sodium bicarbonate), dawsonite ($\text{NaAl}(\text{OH})_2\text{CO}_3$), and halite (NaCl), with total dissolved solids (TDS) ranging in excess of 10,000 mg/L at that depth in that portion of the basin (EPA, 2004). Only very shallow waters such as those from the surficial Wasatch Formation are used for drinking water (Graham 2001, cited in EPA 2004).

Most of the groundwater recharge is provided by winter precipitation and stored as snowpack at the higher elevations within the basin. In the summer, little, if any rainfall infiltrates and percolates to the saturated zone (Glover et al. 1998). Most precipitation is lost to evapotranspiration, with estimates of loss as high as 98% (Taylor 1987, cited in CGS 2003). In the Piceance Basin, recharge flows from recharge areas near the margins of the basin to discharge areas near principal stream valleys. The groundwater moves laterally and/or upward discharging directly to streams, springs, and seeps.

According to the Colorado Division of Water Resources (DWR), one fresh-water well is present within a 0.25 mile radius of the proposed activities, with an additional four within a 0.5-mile radius. The closest well is located approximately 900 feet due west of the proposed well sites. This recently permitted domestic/stock well is not defined by quantitative data. Of the four fresh water wells identified within a half-mile radius, only one is defined by data. Listing a well depth of 115 feet deep, this augmented

domestic use well shows a static water level of 52 feet and a well yield of 15 gallons per minute (gpm). A 1-mile buffer radiating outward from the center of the project area found several additional wells, located primarily northeast of the proposed development in Sections 17, 18, and 20, T7S, R95W. Cross sections of these wells analyzed for well parameters indicated well depths ranging from 95 feet at the shallowest, to 176 feet at the deepest, with accompanying static water levels ranging between 20 feet and 118 feet. Well yields were good, averaging 15 gpm. The identified wells located within the buffer are located between Monument Gulch to the north and an unnamed drainage to the south that flows to the Colorado River. Confirmation of shallow well depths and water levels for these wells indicates completion in the alluvium along stream courses, typical for most water wells in this part of the Basin.

Environmental Consequences

Proposed Action

Potential impacts to groundwater resources from the proposed development would include contamination of the groundwater with produced water, drilling mud, and petroleum constituents. Hydraulic fracturing (fracing) would be incorporated to create additional pathways to facilitate gas production. Proppants used to prop open the newly created fractures are mixed with both fresh and produced water, and typically include sand, aluminum, glass, or plastic beads, with minor amounts, less than 1%, of other compounds such as corrosion, friction, and scale inhibitors (EnerMax Inc. 2007). Fracing techniques are used to create secondary porosity fractures, held open by the proppants, allowing otherwise trapped gas to migrate up the borehole for production. Hydrofracturing would be conducted at 4,000 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 interbedded sediments at the top of the Williams Fork Formation would prevent water or hydrocarbons from migrating to potable water zones.

No Action Alternative

Under the No Action alternative, the proposed development project would not be approved and constructed. As a result, no impacts to groundwater resources within the project boundary would occur.

Analysis on Public Land Health Standard 5 for Water Quality

The Proposed Action and the No Action alternative would be unlikely to prevent Standard 5 from being achieved. This is due to the lack of water bodies and riparian areas that would be affected by the project and by the lease stipulations, COAs, and requirements set for permitting by the COGCC and USACE.

OTHER AFFECTED RESOURCES

In addition to the critical elements, the resources presented in Table 6 were considered for impact analysis relative to the Proposed Action and No Action alternative. Resources that would be affected by the Proposed Action and No Action alternative are discussed following the table.

Table 6. 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

Access and Transportation

Affected Environment

The PJ19 pad is accessed from Interstate Highway 70 (I-70) at Exit 75 (Parachute) and traveling west through Parachute on the frontage road (Highway 6 and 24) about 4.5 miles to CR300; turning south of CR300 and traveling a total of 4.7 miles to the south and then east (including crossing the Colorado River on the Una Bridge); and traveling south and then east a total of 1.5 miles on the EnCana development road, past the PM19 pad (Figure 1). No public vehicle access exists to the pad, since private land must be crossed along the access road off CR300. Aside from 220 feet of new road spur to be constructed to the PJ19 pad, the existing road serving the proposed pad is adequate to handle truck traffic related to planned development operations.

Environmental Consequences

Proposed Action

The Proposed Action would result in a substantial increase in truck traffic related to the development of the 15 wells. 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 7). Once the wells are producing, traffic would decrease to occasional visits for monitoring or maintenance activities. Each well may have to be recompleted once per year, requiring three to five truck trips per day for approximately 7 days.

<i>Vehicle Class</i>	<i>Number of trips per well</i>	<i>Percentage of total</i>
16-wheel tractor trailers	88	7.6%
10-wheel trucks	216	18.6%
6-wheel trucks	452	39.0%
Pickup trucks	404	34.8%
Total	1,160	100.0%

Source: BLM 2006. Note: Trips by different vehicle types are not necessarily distributed evenly during the drilling process. Drilling and completion period is approximately 30 days per well.

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

No Action Alternative

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

Geology and Minerals

Affected Environment

The analysis area lies at the southernmost edge of the Piceance Basin between High Mesa to the south, and the community of Battlement Mesa to the north. High Mesa is one of several debris flow formed alluvial fans identified by topography and labeled as a “mesa” due to an extensive planar surface (Stover1984). These flows consist of a matrix of supported clasts of sandstone and shale along with blocks of basalt up to 3.5 meters. Each debris-flow fan is worn smooth and veneered with loess (Rundell undated). Several of these features are adjacent to the slopes of Battlement Mesa, a large, prominent, basalt-capped highland that stretches approximately 20 miles east-west along the Garfield-Mesa county line between the Colorado River to the north and Plateau Creek to the south. The mesa is visible south of I-70 between Rifle and Parachute, and similar in geology to nearby Grand Mesa. Battlement Mesa consists largely of basalt capped layers of sedimentary rock that includes the Green River and isolated remnants of the Uinta Formations. The Tertiary Wasatch Formation covers most of the area proposed for this development, and consists of siltstone, sandstone, and shale. Additionally, alluvial and colluvial deposits cover the surrounding areas and are the result of uplift and subsequent erosion of the highlands that include Battlement and Grand Mesas. Table 8 lists the formations that outcrop along or near the proposed development area.

The Mesaverde Group is the target zone of the proposed drilling program. Sediments of the Mesaverde Group are composed of marine sandstones and transitional to non-marine beds of coal, shale, and sandstone that were deposited marginal to the great Cretaceous seaway (Warner 1964) that occupied much of the Western Interior region during that time. Due to the rise and fall of sea level, an oscillating shoreline left behind a complex of transgressive and regressive sedimentary sequences of nearshore and offshore sediments.

Table 8. Geologic Formations within the Project Vicinity

<i>Map Symbol</i>	<i>Formation Name</i>	<i>Age</i>	<i>Characteristics</i>	<i>Location</i>
Qa	Quaternary alluvium deposits	Holocene	Chiefly silt, sand, and gravel	Flood plains, fans, and low terraces
Qc	Quaternary colluvial deposits	Holocene	Earthflow, mudflow, landslide, and talus deposits	Stream valleys
Qp	Quaternary pediment deposits	Holocene	Sand and gravel veneering pediment surfaces formed during several cycles of erosion	Mesa sides and tops
Tu	Uinta Formation	Eocene	Siltstone, sandstone and marlstone	Top of Mamm Peak
Tbb	Basalt flows	Miocene and Pliocene	Dense black resistant alkali basalt in lava-flow layers and volcanic conglomerates	White River Plateau and Grand Mesa
Tgp	Parachute Creek Member of Green River Fm	Eocene	Gray and yellow-brown marlstone and tuff and Mahogany oil shale bed	Lower cliffs of Battlement Mesa
Tgg	Garden Gulch Member of Green River Fm	Eocene	Dark –brown and gray flaky shale and brown sandstone and limestone	Battlement Mesa cliffs
Tgd	Douglas Creek Member of Green River Fm	Eocene	Gray and brown sandstone, siltstone, and limestone and green and gray shale	Battlement Mesa cliffs
Two	Wasatch Formation	Eocene, Paleocene	Red, gray, and brown sandstone and siltstone and red, green, and gray shale	Base of Battlement Mesa and predominant surface exposures both north and south of the Colorado River

Source: Tweto et al. 1978, Ellis and Freeman 1984, Shroba and Scott 1997

The mountain-building processes that concurrently took place during the late Cretaceous produced uplift and subsidence structures in central and eastern Utah, western Colorado, and most of Wyoming (USGS 2009). As the highland areas were exposed to erosion and the basin deepened, a greater amount of sediment was available for deposition along the ancient shoreline. The subsequent facies changes that occurred as a result of these two processes are believed to be the trapping mechanism that defines the extensive gas accumulation of the Williams Fork Formation. The source rocks are interbedded and thermally mature gas-prone shales, mudstones, siltstones, and coals. The reservoir rocks are the fine- to medium-grained Williams Fork sandstones, varying in thickness from less than 10 feet to more than 50 feet (Spencer 1988), creating an interbedded relationship between source and reservoir. The trapping mechanism of the tight gas is both stratigraphic and diagenetic.

Environmental Consequences

Proposed Action

Natural gas production is derived from three reservoir intervals, which include the Wasatch Formation, the Williams Fork Formation, and Iles Formation. The latter two make up the Upper Cretaceous

Mesaverde Group. If the proposed wells are proven feasible, initial production rates would be expected to be highest during the first few years of production, then decline during the remainder of the economic lives of the wells. Substantial reserves have been known to be trapped within the tight sands of these reservoirs since the late 1950s, but only within the last decade, and particularly within the last few years, has the integrated application of new technologies turned the tight gas sands of the Mesaverde Group into a profitable play (Kuuskraa 1997). Natural fracture detection, advanced log analysis, more rigorous well completions and recompletions, and denser spacing have increased the amount of recoverable gas within these reservoirs.

Casing programs have been designed to specifically prevent hydrocarbon migration from gas-producing strata penetrated by the wellbore during drilling, initial production and after completion of the well. Identification of potential fresh-water-bearing zones, aquifers, gas-producing zones, and over- and under-pressured zones 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. If one of these identified zones is encountered during drilling, cement volumes will be adjusted to isolate that zone. This is designed to prevent accidental contamination or leakage of hydrocarbons or fracturing fluids into other productive zones within the wellbore.

No Action Alternative

Under the No Action alternative, the 15 Federal wells and associated facilities would not be approved. As a result, no new impacts to the geology and mineral resources on Federal mineral estate would occur.

Noise

Affected Environment

The Proposed Action would lie within an immediate rural setting, but located in proximity (¼ mile) to the community of Battlement Mesa. There are two existing well pads operated by EnCana drilled in past three years on public land. Noise levels in the area are presently created by traffic serving the existing nearby well pads along with the associated noises typical of a residential community and nearby CR300. The proposed PJ19 pad and associated road and pipeline would be located approximately 1,450 feet (0.27 mile) from the nearest residence.

Environmental Consequences

Proposed Action

The project would result in increased levels of noise during the construction, drilling, and completion phases. The noise would be most noticeable along the roads used to haul equipment and at the pad locations. Drilling activities are subject to noise abatement procedures as defined in the Colorado Oil and Gas Conservation Commission Rules and Regulations (Aesthetic & Noise Control Regulations), generally a limit of 80 decibels dBA during the day and 75 dBA during the night, measured at a distance of 350 feet. Operations involving pipeline or gas facility installation or maintenance, the use of a drilling rig, completion rig, workover rig, or stimulation is subject to the maximum permissible noise levels for industrial zones.

Short-term (7- to 14-day) increases in noise levels would characterize road and well pad construction. Based on the Inverse Square Law of Noise Propagation (Harris 1991) and a typical noise level at construction sites of 67 dBA at 500 feet (Table 9), construction noise would range from approximately 54 to 63 dBA at 1,000 feet, approximating those of an active commercial area (EPA 1974).

Table 9. Noise Levels at Typical Construction Sites and along Access Roads			
<i>Equipment</i>	<i>Noise Level (dBA)</i>		
	<i>50 feet</i>	<i>500 feet</i>	<i>1,000 feet</i>
Air Compressor, Concrete Pump	82	62	56
Backhoe	85	65	59
Bulldozer	89	69	63
Crane	88	68	62
Front End Loader	83	83	57
Heavy Truck	88	68	62
Motor Grader	85	65	59
Road Scraper	87	67	61
Tractor, Vibrator/Roller	80	60	54
Sources: BLM (1999a), La Plata County (2002)			

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 dBA at 500 feet, actions associated with drilling and completion would generate approximately 62 dBA at 1,000 feet. This level of noise approximates that associated with light industrial activities (EPA 1974). These increased noise levels would be in addition to levels of noise that are already above background levels due to current oil and gas developments in the area. As stated above, the nearest residence is 0.5 mile away.

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 9, approximately 68 dBA 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.

Noise impacts would decrease during the production phase. These levels would be less than during the construction phase but greater than background levels. During maintenance and workovers, noise levels would increase above those associated with routine well production. Traffic noise would impact residences located along roads that provide primary access into the area. While exposure to these noise levels is unlikely to be harmful, it is likely to be annoying to residents, particularly during periods of heavier traffic for occasional non-routine maintenance operations (e.g., workovers) or during certain atmospheric conditions. Fortunately, production-related truck traffic does not normally occur during nighttime hours, when traffic noise is most noticeable due to cooler, denser air and fewer other ambient sounds.

No Action Alternative

Under the No Action alternative, the project components included in the Proposed Action would not be approved and constructed. Therefore, no noise impacts would accompany this alternative.

Paleontology

Affected Environment

The predominant surface formation within the proposed development is the Tertiary Wasatch Formation (Two). Surface exposures of the area directly underlying the proposed well pad are Quaternary colluvial deposits. Colluvium is defined as unconsolidated earthflow, mudflow, landslide, or talus deposits. Colluvial deposits are considered Potential Fossil Yield Classification (PFYC) Class 2, defined as having a low probability of fossil occurrence. These units are unlikely to contain vertebrate or scientifically significant invertebrate fossils. The thickness of these debris sediments cannot be predicted with certainty, but in general, alluvium, colluvium, and other unconsolidated sediments are much less likely to contain well-preserved plant and animal remains than intact bedrock.

The Wasatch Formation, also known as the DeBeque Formation within this part of the Piceance Basin, is ranked under the PFYC system as a Class 4/5 formation and mapped extensively within the proposed development area. The probability of finding fossils within the Wasatch Formation is rated *high* and *very high* in Class 4 and Class 5 units, respectively. Class 4 units produce significant fossils (vertebrates or scientifically significant invertebrate or plant fossils) but are variable in terms of fossil occurrence and predictability. Class 5 units produce significant fossils both consistently and predictably. Although the Wasatch Formation is ranked high under the PFYC system, 4 and 5 out of 5 classes, lack of bedrock exposure lowers the risk of human-caused adverse impacts and natural degradation within the proposed new well pad area. Most likely, additional Wasatch Formation sediments are draped by landslide and other colluvial debris, and may be encountered during excavation of the proposed pads and access road.

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

Environmental Consequences

Proposed Action

No fossil localities have been identified within the proposed development, but the Wasatch Formation is the underlying stratigraphic unit. Construction activities have the potential to adversely affect important fossils, with the greatest potential for impacts associated during excavation in support of well pad and accompanying facilities (especially pipeline) construction. An examination of the BLM paleontology database indicates the closest documented fossil discovery sites are located over 4,000 feet southeast of the proposed PJ19 well pad in the SE $\frac{1}{4}$ SE $\frac{1}{4}$, Section 30, T7S, R95W, on Wasatch Formation surface exposures. Other sites are identified farther southeast in the NE $\frac{1}{4}$ NW $\frac{1}{4}$, Section 29 T7S, R95W, but more than 5,000 and 6,800 feet farther away. Due to the low probability of fossil occurrence in the surrounding colluvium and landslide debris, fossil resources are not expected to be impacted by the Proposed Action. In the unlikely event that paleontological resources are encountered during the construction phase, the standard paleontological condition of approval would be attached to the APDs. (Appendix A).

No Action Alternative

Under the No Action alternative, the PJ19 well pad and associated facilities would not be constructed. No new impacts to paleontological resources would occur.

Socio-Economics

Affected Environment

The project area is located within Garfield County, Colorado. The population of Garfield County has grown by approximately 2.7 percent per year from 2000 to 2005, resulting in an increase from 44,000 to 51,000 residents (DOLA 2007). Population growth in Garfield County is expected to more than double over the next 20 years from over 50,000 in 2005 to 116,000 in 2025 (DOLA 2007).

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.

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

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

The growth of the oil and gas industry in the past 10 years has been increasingly important to local economies (BLM 2006). Gas production in Garfield County has increased tremendously during the past eight years from 70 billion cubic feet (BCF) in 2000 to more than 376 BCF in 2008 (COGCC 2009). In addition, Garfield County is experiencing the fastest oil and gas development in Colorado with 3,000 drilling permits currently approved (COGCC 2009). While the number of workers employed in the mining and extraction industry in Garfield County has been shown to be only 1.7%, this number is considered misleading because some oil and gas employment has been incorporated as part of the construction sector statistics instead (BLM 2006). For example, in the year 2005, an estimated 4000 persons were directly employed by gas development companies and their subcontractors in Garfield County (Garfield County 2007).

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

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

Property tax revenue from oil and gas development has also become the largest source of public revenue in Garfield County (BLM 2006). In the year 2007, oil and gas assessed valuation in Garfield County amounted to approximately \$1.9 billion, or about 65% of total assessed value. Total tax revenues from property taxes and special district levies were \$130 million. Tax dollar distributions in 2007 were Schools 37%, County 30%, Special Districts 13%, Fire Districts 10%, Colleges 8%, and Towns 2%.

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

Environmental Consequences

Proposed Action

The Proposed Action would positively impact the local economies of Garfield County through the 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 increase in tax and royalty revenues. Some minor economic loss to private landowners or guides 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 minor negative social impacts including (1) a negligible decrease in the recreational character of the area (see Recreation); (2) reduced scenic quality (see Visual Resources); (3) increased dust levels, especially during construction (see Air Quality); and (4) increased traffic (see Transportation).

No Action Alternative

The No Action alternative would result in no additional impacts to socio-economics of the general area.

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 two soil complexes. The majority of the pad with exception of the southeast corner would be located on the Potts-Ildefonso complex. This deep, well-drained soil occurs on mesas, alluvial fans, and sides of valleys at elevations from 5,000 to 6,500 feet and slopes of 12 to 25 percent. This soil is derived

from sandstone, shale, or basalt, with small amounts of aeolian material. Surface runoff is medium, and erosion hazard is moderate. Primary uses for these soils are limited grazing and wildlife habitat.

The southeastern corner of the proposed pad and the access road would be located on the Ildefonso stony loam unit. This deep, well-drained, hilly soil also occurs on mesas, sides of valleys, and alluvial fans at elevations from 5,000 to 6,500 feet and on slopes of 25 to 45%. This soil is derived primarily from basalt and may contain a small amount of aeolian material at the top of the unit. Surface runoff for this soil is medium and erosion hazard is severe. Primary uses for this soil include grazing and wildlife habitat.

Environmental Consequences

Proposed Action

The Proposed Action would result in approximately 5.6 acres of short-term vegetation loss and soil disturbance, with a long-term loss of approximately 1.6 acres. Being located in the reclaimed 1987 Battlement Mesa wildfire, the area generally contains adequate vegetation buffers that would minimize the potential for sediment transport. However, construction activities would cause slight to moderate increases in local soil loss, loss of soil productivity, and sediment available for transport to surface waters. Potential for such soil loss and transport would increase as a function of slope, feature (pad, road, or pipeline route) to be constructed, and proximity to drainages.

Most of the area to be disturbed consists of soils with moderate risk of erosion or slope instability. However, the short 220-foot-long road spur would cross soil with severe erosion hazard. Since the project area is also situated within 1 mile of the Colorado River, particular care would be taken at these locations during construction and reclamation to ensure that proper BMPs, including the COAs listed in Appendix A, are utilized to prevent erosion and slope instability due to construction activities.

No Action Alternative

The No Action alternative would have no bearing on Standard 1 because no development activities would occur.

Analysis on Public Land Health Standard 1 for Upland Soils

The Proposed Action with associated mitigation would not likely prevent Standard 1 from being achieved.

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

Affected Environment

A large portion of the project area was burned in the 1987 Battlement Mesa fire, which converted the original pinyon-juniper (*Pinus edulis-Juniperus osteosperma*) woodland into a grassland community. A smaller portion of the project area left untouched by the fire contains a climax community of pinyon-juniper woodland interspersed with Wyoming sagebrush (*Artemisia tridentata* ssp. *wyomingensis*). Understory species in this community include needle-and-thread grass (*Hesperostipa comata*), bluebunch wheatgrass (*Pseudoroegneria spicata*), bottlebrush squirreltail (*Elymus elymoides*), Indian ricegrass (*Achnatherum hymenoides*), galleta grass (*Pleuraphis jamesii*), rayless tansy-aster (*Machaeranthera grindelioides*), and the subshrub broom snakeweed (*Gutierrezia sarothrae*),

The grassland community is very weedy with cheatgrass (an annual non-native grass) and field bindweed (a perennial non-native forb) as the dominant species. Rubber rabbitbrush (*Chrysothamnus nauseosus*) and snakeweed form the shrub layer. The same native perennial grasses listed above for the pinyon-juniper community are scattered throughout the grassland. Scarlet globemallow (*Sphaeralcea coccinea*) is the dominant native forb.

Environmental Consequences

Proposed Action

Direct effects to vegetation under the Proposed Action would include short- and long-term losses of vegetation and long-term modification of community structure and composition. The total short-term surface disturbance resulting from proposed development activities on private land would be 5.6 acres, of which 1.6 acres of disturbance would remain for the life of the project.

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

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

No Action Alternative

Under the No Action alternative, no construction or development activities would take place; therefore, vegetation would not be affected.

Analysis on Public Land Health Standard 3 for Plant and Animal Communities (partial, see also **Wildlife, Aquatic and Wildlife, Terrestrial**)

The poor condition of vegetation communities was the most widespread problem noted on this landscape. Sites not achieving the standard are in sagebrush and shadscale communities and pinyon-juniper woodlands. On the sagebrush sites, species, lifeform, and age class diversity is lacking. Few perennial grasses or forbs are present. Cheatgrass is frequently dominant on the sites. Several sagebrush stands have healthy vigorous sagebrush with good recruitment of sage seedlings, but sagebrush on most sites is moderately to heavily hedged and lacking in vigor and reproduction. A number of the sagebrush sites are being invaded by young juniper and pinyon pine trees. These sites varied in terms of the degree of encroachment, but eventually these sites will become dominated by pinyon-juniper unless something is done to set back succession and regenerate the sagebrush.

Most of the pinyon-juniper woodlands consist of mature Utah juniper with lesser amounts of pinyon pine. Most of these woodland sites have very few understory species present. Perennial grasses and forbs are generally minimal or absent, and where shrubs are present, often they are decadent or in poor vigor. Age

class diversity is poor with most plants in the mature to overmature stage with little recruitment and establishment of younger age classes. Cheatgrass is abundant and occasionally dominant under the tree canopy (BLM 2000).

The Proposed Action would likely contribute, albeit in a minor way, to the further deterioration of vegetation communities and would move the area further from achieving conformance with the standard.

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 because no development activities would take place.

Visual Resources

Affected Environment

Landscape character of the project area is best described as the north-facing lower aspect of the slopes of High Mesa south of the community of Battlement Mesa featuring various ephemeral draws that feed into an unnamed drainage just south of CR300. The dominant vegetation type varies between forested juniper woodlands and the open grass-shrubland that resulted from the 1987 Battlement Mesa wildfire ravaging much of the juniper woodlands. The pad, lying within the fringe of both vegetation types, would set along an existing oil and gas road with two operating well pads nearby on public land. CR300 and the southern extent of the Battlement Mesa community also lie ¼ mile north of the proposed pad directly in the foreground view. An overhead power transmission line runs parallel to CR300 and skirts the northern edge of the proposed PJ19 footprint. An existing private road traverses from east to west across the slopes of High Mesa near the proposed PJ19 pad that readily draws the casual observer's attention. The proximity of the proposed pad to the community and CR300 would present unique challenges in mitigating the impacts to the viewshed. The pad site would be middleground visible from short sections of I-70 west of Parachute, primarily to eastbound traffic.

For the PJ19 pad, visual concerns may be addressed in a split estate situation (private surface with Federal minerals), although the lease (COC019572) fails to identify any special stipulations. In this situation, the operator is asked to voluntarily comply with the visual resource objectives. The Federal lease falls within Class II Visual Resource Management (VRM) Classification (BLM 1984) that states:

VRM Class II areas are managed to retain the existing character of the landscape. The level of change to the characteristic landscape resulting from Federal or Federally approved actions should be low. Management activities may be seen, but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture in the predominant natural features of the characteristic landscape.

Environmental Consequences

Proposed Action

The construction of the proposed project would create contrast within the immediate landscape by removing the existing vegetation, exposing bare ground, and creating a series of distinct lines and colors within the landscape. Such visual changes would be most evident after pad construction and throughout the period that the pad lays "open" during the well drilling and completion work. Once wells are put into production and the pad is reshaped and vegetation is reestablished, the overall visual contrast and texture of the site would be expected to blend with the surroundings.

Given the proximity to the community and CR300 traffic, the BLM and EnCana will develop a pad construction and reclamation plan that maximizes the opportunities to mitigate the visual impacts of the project and attempt to satisfy the Class II objectives. The primary focus of the plan would involve over-excavation of the site during pad construction to keep it low in the viewshed, creating berms on the pad edge during the well drilling phase to shield noise, light, and views while also generating excess materials so landforms can be created at time of pad reclamation that blend with the surrounding area. The success of the site revegetation during the pad reclamation work would be critical in achieving the VRM Class II objective. Based on the pad review after construction is completed, the use of a colorant product (e.g., Profile®) on the “open” pad cut and fill slopes would also be a visual measured being considered for use during the drilling and completion phase (Appendix A).

Total short-term disturbance related to the Proposed Action would amount to 5.6 acres, with long-term disturbance after site reclamation and successful revegetation amounting to 1.6 acres

No Action Alternative

Impacts to the VRM Class II viewshed would not occur, because no new surface disturbance would result from the No Action alternative.

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

Affected Environment

No perennial streams are present in the project vicinity. Therefore, fish populations are also not present. Similarly, no macroinvertebrates with larvae that have a protracted aquatic stage (nymphs) are present. However, runoff would drain into the Colorado River, which supports Federally listed and BLM sensitive fish species, as well as a variety of other native and non-native fishes and aquatic macroinvertebrates important as prey to these species, particularly the introduced sportfishes.

Environmental Consequences

Proposed Action

Since no streams are present in the immediate vicinity of the project, the Proposed Action would not have direct impacts on aquatic wildlife. However, potential effects on fish and aquatic invertebrates in the Colorado River, which is approximately 1 mile north of the project area, could result from transport of sediments. Since many aquatic invertebrates and native fishes are detritus feeders during some stages of development, removal of vegetation could decrease available sources of food for these species. Sediment also reduces aquatic insect productivity which could also impact food resources for fish species.

However, the small amount of sediment that would ultimately reach the Colorado River should have minimal impact on fisheries, because sediment levels are projected to be well within the background levels for the Colorado River. Minor increases in sediment produced from the action would be undetectable. However, as similar natural gas development activity continues within the Colorado River, increases in sediment may have a greater impact on sediment intolerant aquatic species. Mitigation measures would minimize impacts associated with sedimentation.

No Action Alternative

The No Action alternative constitutes denial of the 15 Federal APDs described in the Proposed Action and any of the associated upgrades to the pad, road, and pipeline. No new surface disturbance on private

land would occur under the No Action alternative, thus eliminating impacts from this development to aquatic wildlife species.

Analysis on Public Land Health Standard 3 for Plant and Animal Communities (partial, see also **Vegetation and Wildlife, Terrestrial and Aquatic**)

The health of aquatic species (fish and aquatic invertebrates) is affected by physical habitat quality (flow regime, type of substrate, and adjacent vegetation) and water quality. According to the 2000 Battlement Mesa Land Health Assessment, existing water quality in Pete and Bill Creek, Dry Creek and Monument Gulch does not exceed the standards established for the classified uses. Soils in the area appear stable and functioning with no significant problems regarding indicators of soil health. Much of the terrestrial vegetation in the Battlement Mesa area is functioning at risk. Riparian vegetation, however, is achieving the standard. With implementation of mitigation measures discussed in the sections on Water Quality, Soils, Vegetation, and Terrestrial Wildlife, the condition of aquatic wildlife in the project vicinity would not be expected to show a downward trend.

The No Action alternative would have no bearing on the ability of the area to meet Standard 3, because the proposed development would not occur.

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

Affected Environment

A large portion of the project area was burned in the 1987 Battlement Mesa fire which converted the original pinyon-juniper woodland into a grassland community. A smaller portion of the project area was left untouched by the fire and contains a climax community of pinyon-juniper woodland interspersed with sagebrush. Given these vegetation types, the area provides cover, forage, breeding, and nesting habitat for a variety of big game and small game species as well as nongame mammals, birds, and reptiles.

Large Mammals

The project area contains winter range and severe winter range for mule deer (*Odocoileus hemionus*) and a smaller amount of winter range for Rocky Mountain elk (*Cervus elaphus nelsoni*) as mapped by the CDOW (2009). The mule deer is a recreationally important species that are common throughout suitable habitats in the region. Although most of the area is mapped as mule deer winter range, the project area also receives use by deer during the summer. Rocky Mountain elk are also recreationally important, and the project area contains a fair amount of suitable habitat for this species.

Large carnivores potentially present in the project vicinity include the mountain lion (*Puma concolor*) and black bear (*Ursus americanus*). Mountain lions move seasonally to generally follow migrations of their preferred prey, mule deer. Black bears are less common in the project area due to the scarcity of sufficient forest cover and suitable foods (including acorns and berries). Two medium-sized carnivores, the coyote (*Canis latrans*) and bobcat (*Lynx rufus*), are also present throughout the region in open habitats and broken or wooded terrain, respectively, where they hunt for small mammals, reptiles, and ground-dwelling birds. Smaller carnivores in habitats similar to those near the project site include the ringtail (*Bassariscus astutus*) and spotted skunk (*Spilogale gracilis*).

Resident Raptors and Other Birds

Raptors potentially nesting in the large pinyon or juniper trees on nearby slopes include two small resident hawks—Cooper's hawk (*Accipiter cooperii*) and sharp-shinned hawk (*A. striatus*)—which build

sticknests in the tree canopies. Two larger resident raptors common throughout the region—the red-tailed hawk (*Buteo jamaicensis*) and great horned owl (*Bubo virginiana*)—also nest in trees as well as rocky ledges. Although these species are potentially present in the area, no nests or individuals were observed during site surveys.

Other resident or short-distance migratory species in the project vicinity include the northern flicker (*Colaptes auratus*), common raven (*Corvus corax*), black-billed magpie (*Pica hudsonia*), American robin (*Turdus migratorius*), western meadowlark (*Sturnella neglecta*), blue-gray gnatcatcher (*Poliopitila caerulea*), and house finch (*Carpodacus mexicanus*). See the sections on Migratory Birds and Special-Status Species for discussions of other birds in the area.

Reptiles and Amphibians

The project area is within the elevational range of most reptile species known to occur in Garfield County. Species most likely to occur include the short-horned lizard, (*Phrynosoma hernandesi*), western fence lizard (*Sceloporus undulatus*), tree lizard (*Urosaurus ornatus*), and gopher snake (bullsnake) (*Pituophis catenifer*).

The area is also within the known range of the Great Basin spadefoot, Woodhouse's toad (*Bufo woodhousii*), western chorus frog (*Pseudacris triseriata*), and northern leopard frog. The Great Basin spadefoot and northern leopard frog are addressed in the section on special-status species. The Woodhouse's toad occurs primarily along ephemeral washes or seasonal ponds. The northern chorus frog occurs primarily in cattail and bulrush wetlands and along the vegetated margins of seasonal or perennial ponds and slow-flowing streams.

Environmental Consequences

Proposed Action

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 could result from the 5.6 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 (deer and elk) or the spring/summer breeding season (raptors, songbirds, amphibians). 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. Disturbance during the winter can displace wildlife, depleting much-needed energy reserves and may lead to decreased over winter survival.

Additional, indirect habitat loss may occur if increased human activity (e.g., traffic, noise) associated with infrastructure causes intolerant species to be displaced or alter their habitat use patterns. The extent of indirect habitat loss varies by species, the type and duration of the disturbance, and the amount of screening provided by vegetation and topography. In general, disturbance-related impacts are temporary, with patterns of distribution and habitat use returning to pre-disturbance conditions rather quickly when the disturbance stops.

To protect big game winter habitat use, a 60-day timing limitation shall be applied to activities associated with Federal lease COC019572. During the January 1 to March 1 period, construction, drilling, and completion activities are prohibited. Operation and maintenance activities are permissible.

No Action Alternative

The No Action alternative constitutes denial of the 15 Federal APDs described in the Proposed Action and any of the associated upgrades to the pad, road, and pipeline. No new surface disturbance on private land would occur under the No Action alternative, thus eliminating impacts from this development to aquatic wildlife species.

SUMMARY OF CUMULATIVE IMPACTS

Until relatively recently, modifications of the region have been characteristic of agricultural and ranching lands, with localized industrial impacts associated with the railroad and I-70 corridors. More recently, 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. Cumulative 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 1999 FSEIS was characterized as significant, and while new technologies and regulatory requirements have reduced the impacts of some land uses, it is nonetheless clear that past, present, and reasonably foreseeable future actions has had and would continue to have adverse affects on various elements of the human environment. The anticipated impact levels for existing and future actions range from negligible to locally major, and primarily negative, for specific resources. The primary reasons for this assessment are twofold: (1) the rate of development, particularly oil and gas development, has until recently been increasing in the area, resulting in an accelerated accumulation of individually nominal effects; and (2) residential and commercial expansion, as well as most of the oil and gas development, has occurred private holdings lands 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. Although the contribution would be very minor, the Proposed Action would contribute incrementally to the collective impact to air quality, vegetation, migratory birds, terrestrial wildlife, and other resources.

PERSONS AND AGENCIES CONSULTED

EnCana Oil & Gas (USA) Inc.: Scott Parker, Bryan Whitely, Jason Oates, Miracle Pfister, Deanne Spector, Bob Anderson

Colorado Oil and Gas Conservation Commission: Dave Kubezko

Garfield County Oil and Gas Liaison: Nikki Reckles

Wasatch Surveying: Buck Hinkson

INTERDISCIPLINARY REVIEW

BLM participants in preparation of this EA—including review of surveys by EnCana’s consultants, evaluation of impacts associated with implementation of the Proposed Action, and identification of COAs to be attached and enforced by BLM—are listed in Table 10.

Table 10. BLM Interdisciplinary Team Authors and Reviewers		
<i>Name</i>	<i>Title</i>	<i>Areas of Participation</i>
Jim Byers	Natural Resource Specialist	Project Lead, Access and Transportation, Air Quality, Noise, Socio-Economics, Soils, Surface Water Quality, Visual Resources, Waters of U.S.
Allen Crockett	Supervisory Nat. Res. Spec./Phys. Sci.	NEPA Review
Beth Brenneman	Ecologist	Invasive Non-native Species, Special Status Species (Plants), Vegetation
Sylvia Ringer	Wildlife Biologist	Migratory Birds, Special Status Species (Animals), Wildlife - Aquatic and Terrestrial
John Brogan	Archaeologist	Cultural Resources, Native American Religious Concerns
Karen Conrath	Geologist	Geology and Minerals, Groundwater, Paleontology,
Will Howell	Petroleum Engineer	Downhole COAs

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The Environmental Assessment (EA) 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 (EIS) is not necessary to further analyze the environmental effects of the Proposed Action.

DECISION RECORD

DECISION: It is my decision to approve the Proposed Action as described and analyzed in this EA, contingent upon approval by BLM of an Application for Permit to Drill (APD) for one or more of the 15 Federal oil and gas wells planned for the pad. This decision will provide for the orderly, economical, and environmentally sound exploration and development of oil and gas resources on valid Federal oil and gas leases.

RATIONALE: The bases for this decision are as follows:

1. Approval of the Proposed Action is validating the rights granted with the Federal oil and gas leases to develop the leasehold to provide commercial commodities of oil and gas.
2. The environmental impacts would be avoided, minimized, or offset with the mitigation measures incorporated into the Proposed Action or attached and enforced by BLM as Conditions of Approval (COAs).

This Decision does not authorize the initiation of surface-disturbing activities on BLM lands or of drilling activities associated with any Federal oil and gas well. Initiation of surface-disturbing activities and drilling of Federal oil and gas wells may commence upon approval by BLM of one or more APDs submitted by EnCana in conjunction with the project.

MITIGATION MEASURES: Mitigation measures presented in Appendix A will be incorporated as COAs into the APDs for each Federal well drilled on the PJ19 pad and any related road or pipeline construction or other surface-disturbing activity authorized pursuant to this Decision.

NAME OF PREPARER: Jim Byers

SIGNATURE OF AUTHORIZED OFFICIAL:



Allen B. Crockett, Ph.D., J.D.
Supervisory Natural Resource Specialist

DATE: July 23, 2010

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APPENDIX A
Surface-Use and Downhole Conditions of Approval
EnCana PJ19 Pad

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SURFACE-USE CONDITIONS OF APPROVAL

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

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

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

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

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

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

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

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

Final seedbed preparation shall consist of scarifying (raking or harrowing) the spread topsoil prior to seeding. If more than one season has elapsed between final seedbed preparation and seeding,

and if the area is to be broadcast-seeded or hydroseeded, this step shall be repeated no more than 1 day prior to seeding to break up any crust that has formed.

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

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

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

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

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

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

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

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

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

- h. Erosion Control. Cut-and-fill slopes shall be protected against erosion with the use of water bars, lateral furrows, or other measures approved by the BLM. Cut-and-fill slopes along drainages or in areas with high erosion potential shall also be protected from erosion using hydromulch designed specifically for erosion control or biodegradable blankets/matting, bales, or wattles of weed-free straw or weed-free native grass hay. A well-anchored fabric silt fence shall also be placed at the toe of cut-and-fill slopes along drainages or to protect other sensitive areas from deposition of soils eroded off the slopes. Additional BMPs shall be employed as necessary to reduce soil erosion and offsite transport of sediments.

- i. Site Protection. The pad shall be fenced to BLM standards to exclude livestock grazing for the first two growing seasons or until seeded species are firmly established, whichever comes later. The seeded species will be considered firmly established when at least 50 percent of the new plants are producing seed. The BLM will approve the type of fencing.
 - j. Monitoring. The operator shall conduct annual monitoring surveys of all sites categorized as “operator reclamation in progress” and shall submit an annual monitoring report of these sites to the BLM by **December 31** of each year. The monitoring program shall use the four Reclamation Categories defined in Appendix I of the 1998 DSEIS to assess progress toward reclamation objectives. The annual report shall document whether attainment of reclamation objectives appears likely. If one or more objectives appear unlikely to be achieved, the report shall identify appropriate corrective actions. Upon review and approval of the report by the BLM, the operator shall be responsible for implementing the corrective actions or other measures specified by the BLM.
8. Weed Control. The operator shall regularly monitor and promptly control noxious weeds or other undesirable plant species as set forth in the Glenwood Springs Field Office *Noxious and Invasive Weed Management Plan for Oil and Gas Operators*, dated March 2007. A Pesticide Use Proposal (PUP) must be approved by the BLM prior to the use of herbicides. Annual weed monitoring reports shall be submitted to BLM by **December 1**.
 9. Big Game Winter Range Timing Limitation. To protect big game winter habitat use, a 60-day timing limitation shall be applied to activities associated with Federal lease COC019572. During the **January 1 to March 1** period, construction, drilling, and completion activities are prohibited. Operation and maintenance activities are permissible.
 10. Bald and Golden Eagles. It shall be the responsibility of the operator to comply with the Bald and Golden Eagle Protection Act (Eagle Act) with respect to “take” of either eagle species. Under the Eagle Act, “take” includes to pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest and disturb. “Disturb” means to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, (1) injury to an eagle; (2) a decrease in its productivity by substantially interfering with normal breeding, feeding, or sheltering behavior; or (3) nest abandonment by substantially interfering with normal breeding, feeding, or sheltering behavior. Avoidance of eagle nest sites, particularly during the nesting season, is the primary and preferred method to avoid a take. Any oil or gas construction, drilling, or completion activities planned within 0.5 mile of a bald or golden eagle nest, or other associated activities greater than 0.5 miles from a nest that may disturb eagles, should be coordinated with the BLM project lead and BLM wildlife biologist and the USFWS representative in the BLM Field Office (970-876-9051).
 11. Raptor Nesting. Raptor nest surveys for EnCana’s PJ19 pad conducted on April 14, 2010 did not result in location of raptor nest structures within 0.25 mile of a well pad or 0.125 mile of an access road, pipeline, or other surface facility associated with this project. Therefore, a Raptor Nesting Timing Limitation COA is not attached to this EA. To ensure compliance with the Migratory Bird Treaty Act, the operator should schedule construction or drilling activities to begin outside the raptor nesting season (February 1 to August 15) if practicable. If initiation of construction, drilling, or completion activities during these dates cannot be avoided, the operator is responsible for complying with the Migratory Bird Treaty Act, which prohibits the “take” of birds or active nests (those containing eggs or young), including nest failure caused by noise and human activity.
 12. Migratory Birds. It shall be the responsibility of the operator to comply with the Migratory Bird Treaty Act (MBTA) with respect to “take” of migratory bird species. Under the MBTA, “take”

means to pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. The operator shall prevent use by migratory birds of any pit containing fluids associated with oil or gas operations, including but not limited to reserve pits, produced water pits, frac-water pits, cuttings trenches (if covered by water/fluid), and evaporation pits. Fluids in these pits may pose a risk to migratory birds (e.g., waterfowl, shorebirds, wading birds, songbirds, and raptors) as a result of ingestion, absorption through the skin, or interference with buoyancy and temperature regulation. Regardless of the method used, it shall be in place within 24 hours following the placement of fluids into a pit. Because of high toxicity to birds, oil slicks and oil sheens should immediately be skimmed off the surface of any pit that is not netted. The most effective way to eliminate risk to migratory birds is prompt drainage, closure, and reclamation of pits, which is strongly encouraged. All mortality or injury to species protected by the MBTA shall be reported immediately to the BLM project lead and to the USFWS representative in the BLM Field Office at 970-876-9051 and visit <http://www.fws.gov/mountain-prairie/contaminants/oilpits.htm>.

13. Birds of Conservation Concern. Pursuant to BLM Instruction Memorandum 2008-050, all surface-disturbing activities are prohibited from **May 15 to July 15** to reduce impacts to Birds of Conservation Concern (BCC). An exception to this COA will be granted if nesting surveys conducted no more than one week prior to surface-disturbing activities indicate that no BCC species are nesting or otherwise present within 10 meters of the area to be disturbed. Nesting surveys shall include an audial survey for diagnostic vocalizations in conjunction with a visual survey for adults and nests. Surveys shall be conducted by a qualified breeding bird surveyor between sunrise and 10:00 AM under favorable conditions for detecting and identifying a BCC species. This provision does not apply to ongoing construction, drilling, or completion activities that are initiated prior to May 15 and continue into the 60-day period at the same location.
14. Range Management. Range improvements (fences, gates, reservoirs, pipelines, etc) shall be avoided during development of natural gas resources to the maximum extent possible. If range improvements are damaged during exploration and development, the operator will be responsible for repairing or replacing the damaged range improvements. If a new or improved access road bisects an existing livestock fence, steel frame gate(s) or a cattleguard with associated bypass gate shall be installed across the roadway to control grazing livestock.
15. Paleontological Resources. All persons associated with operations under this authorization shall be informed that any objects or sites of paleontological or scientific value, such as vertebrate or scientifically important invertebrate fossils, shall not be damaged, destroyed, removed, moved, or disturbed. If in connection with operations under this authorization any of the above resources are encountered the operator shall immediately suspend all activities in the immediate vicinity of the discovery that might further disturb such materials and notify the BLM of the findings. The discovery must be protected until notified to proceed by the BLM.

Where feasible, the operator shall suspend ground-disturbing activities at the discovery site and immediately notify the BLM of any finds. The BLM will, as soon as feasible, have a BLM-permitted paleontologist check out the find and record and collect it if warranted. If ground-disturbing activities cannot be immediately suspended, the operator shall work around or set the discovery aside in a safe place to be accessed by the BLM-permitted paleontologist.
16. Cultural Education/Discovery. All persons in the area who are associated with this project shall be informed that if anyone is found disturbing historic, archaeological, or scientific resources, including collecting artifacts, the person or persons will be subject to prosecution.

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

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

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

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

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

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

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

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

Production facilities shall be placed as indicated on the plats attached to the APD, unless an alternative placement is approved by the BLM, to avoid or minimize visibility from travel corridors, residential areas, and other sensitive observation points—unless directed otherwise by the BLM due to other resource concerns—and shall be placed to maximize reshaping of cut-and-fill slopes and interim reclamation of the pad.

Prior to beginning pad construction and again after construction and prior to interim reclamation earthwork, BLM and EnCana personnel shall review the site and develop a pad reclamation plan that maximizes the opportunities to mitigate the visual impacts of the project and attempt to satisfy the Class II objectives. The primary focus of the plan would involve over-excavation of the site during pad construction to keep it low in the viewshed, creating berms on the pad edge during the well drilling phase to shield noise, light and views while also generating excess materials so landforms can be created at time of pad reclamation that blend with the surrounding area. Based on the pad review after construction is completed, the use of Profile's colorant product on the "open" pad cut and fill slopes will also be a visual mitigation consideration during the well drilling and completion phase.

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

Above-ground facilities shall be painted **Shadow Gray** to minimize contrast with adjacent vegetation or rock outcrops.

18. Windrowing of Topsoil. Topsoil shall be windrowed around the pad perimeter to create a berm that limits and redirects stormwater runoff and extends the viability of the topsoil per BLM Topsoil Best Management Practices (BLM 2009 PowerPoint presentation available upon request from Glenwood Springs Field Office). Topsoil shall also be windrowed, segregated, and stored along pipelines and roads for later spreading across the disturbed corridor during final reclamation. Topsoil berms shall be promptly seeded to maintain soil microbial activity, reduce erosion, and minimize weed establishment.
19. Soils. Cuts and fills shall be minimized when working on erosive soils and slopes in excess of 30 percent. Cut-and-fill slopes shall be stabilized through revegetation practices with an approved seed mix shortly following construction activities to minimize the potential for slope failures and excessive erosion. Fill slopes adjacent to drainages shall be protected with well-anchored silt fences, straw wattles, or other acceptable BMPs designed to minimize the potential for sediment transport. On slopes greater than 50 percent, BLM personnel may request a professional geotechnical analysis prior to construction.
20. Interim Reclamation Priority. The operator shall plan its development of the wells on the PJ19 pad in a manner that optimizes the drilling and well completion time to a single period of months (working around the timing limitation COAs addressed herein) and would allow the interim reclamation of the pad to occur at the earliest practicable timeframe. These measures would ensure a "get in and get out approach" to this pad development since it lies in close proximity to the Battlement Mesa community.
21. Noise and Light Mitigation during the Drilling/Completion Work. Sheet 3 of Wasatch Survey Plats for the PJ19 pad indicates the use of earthen berms or hay-bale sound barrier shall be constructed between PT1 and PT2. Additionally, such earthen berms, stacked hay bales, and/or metal sound walls shall be constructed adjacent to the *entire* upper edge of the fillslope to provide noise and nighttime lighting relief in the west, north and east directions.

DOWNHOLE CONDITIONS OF APPROVAL
Applications for Permit to Drill

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

Surface Location: NWSE, Section 19, Township 7 South, Range 95 West, 6th P.M.

<u>Well Name</u>	<u>Well No.</u>	<u>Bottomhole Location</u>	<u>Lease</u>
Daybreak Fed	19-2 (PJ19)	NWNE, Sec 19, T7S, R95W	COC 19572
Daybreak Fed	19-2D (PJ19)	NWNE, Sec 19, T7S, R95W	COC 19572
Daybreak Fed	19-3BB (PJ19)	NENW, Sec 19, T7S, R95W	COC 19572
Daybreak Fed	19-6 (PJ19)	SENW, Sec 19, T7S, R95W	COC 19572
Daybreak Fed	19-6BB (PJ19)	SENW, Sec 19, T7S, R95W	COC 19572
Daybreak Fed	19-6C (PJ19)	SENW, Sec 19, T7S, R95W	COC 19572
Daybreak Fed	19-6D (PJ19)	SENW, Sec 19, T7S, R95W	COC 19572
Daybreak Fed	19-7 (PJ19)	SWNE, Sec 19, T7S, R95W	COC 19572
Daybreak Fed	19-7BB (PJ19)	SWNE, Sec 19, T7S, R95W	COC 19572
Daybreak Fed	19-7C (PJ19)	SWNE, Sec 19, T7S, R95W	COC 19572
Daybreak Fed	19-8 (PJ19)	SENE, Sec 19, T7S, R95W	COC 19572
Daybreak Fed	19-8BB (PJ19)	SENE, Sec 19, T7S, R95W	COC 19572
Daybreak Fed	19-8C (PJ19)	SENE, Sec 19, T7S, R95W	COC 19572
Daybreak Fed	19-8D (PJ19)	SENE, Sec 19, T7S, R95W	COC 19572

1. Twenty-four hours *prior* to (a) spudding, (b) conducting BOPE tests, (c) running casing strings, and (d) within twenty-four hours *after* spudding, the CRVFO shall be notified. One of the following CRVFO inspectors shall be notified by phone: Steve Ficklin at 970-876-9036 (office) or 970-319-2509 (cell); David Giboo at 970-876-9038 (office) or 970-319-2211 (cell); Todd Sieber at 970-876-9019 (office) or 970-319-7887 (cell); or Alan White at 970-876-9037 (office) or 970-366-2565 (cell).
2. A CRVFO petroleum engineer shall be contacted for a verbal approval prior to commencing remedial work, plugging operations on newly drilled boreholes, changes within the drilling plan, sidetracks, changes or variances to the BOPE, deviating from conditions of approval, and conducting other operations not specified within the APD. Contact Will Howell at 970-876-9049 (office) or 970-319-5837(c) for verbal approvals. A secondary contact for verbal approvals is Dane Geyer at 970-876-9048 (office) or 970-589-6887 (cell).
3. If a well control issue arises during drilling or completions operations (e.g. kick, blowout, or water flow, casing failure occurs, or an increase in bradenhead pressure), Will Howell 970-876-9049 (office) or 970-319-5837(cell) or Dane Geyer at 970-876-9048 (office) or 970-589-6887 (cell) shall be notified within 24 hours from the time of the event. IADC, Driller's Logs, and Pason Logs (mud logs) will be forwarded to: CRVFO - Will Howell/Dane Geyer, 2300 River Frontage Road, Silt, Colorado 81652 within 24 hours of a well control event.
4. The BOPE shall be tested and conform to Onshore Order #2 for a **3M** system.
5. A casinghead rated to 3,000 psi or greater shall be utilized.
6. An electrical/mechanical mud monitoring equipment shall be function tested prior to drilling out the surface casing shoe. As a minimum, this equipment shall include a trip tank, pit volume totalizer, stroke counter, and flow sensor.
7. Prior to drilling out the surface casing shoe, gas detecting equipment shall be installed in the mud return system, and the rate of penetration/mud shall be monitored for hydrocarbon gas/pore pressure changes.

8. A gas buster shall be functional and all flare lines effectively anchored in place, prior to drilling out the surface casing shoe. The discharge of the flare lines shall be a minimum of 100 feet from the well head and targeted at bends. The panic line shall be a separate line (not open inside the buffer tank) and effectively anchored. All lines shall be downwind of the prevailing wind direction and directed into a flare pit, which cannot be the reserve pit. The flare system shall use an automatic ignition. Where noncombustible gas is likely or expected to be vented, the system shall be provided supplemental fuel for ignition and maintain a continuous flare.
9. 1051-1200feet of Surface Casing will be required on these wells to protect potential water source/aquifers and maintain well control.
10. After the surface casing is cemented, a Pressure Integrity Test/FIT will be performed on the first well drilled in accordance with OOGO No. 2; Sec. III, B.1. i. in order to make sure the surface casing is set in a competent formation. Submit the results from the test via email (william_howell@blm.gov) on the first well drilled on the pad and record results in the IADC log.
11. Prior to commencing fracturing operations, the production casing shall be tested to the maximum anticipated surface fracture pressure (5000 psi) and held for 15 minutes. If leak-off is found, Will Howell shall be notified within 24 hours of the failed test, but prior to proceeding with fracturing operations. The test shall be charted and set to a time increment as to take up no less than a quarter of the chart per test. The chart shall be submitted with the well completion report.
12. As a minimum, cement shall be brought to 200 feet above the Mesaverde. After WOC for the production casing, a CBL/Temperature Log shall be run (from TD to 200 feet above the TOC) and an electronic copy submitted within 36 hours to CRVFO - Will Howell/Dane Geyer, 2300 River Frontage Road, Silt, Colorado 81652. If the TOC is lower than required or the cement sheath of poor quality, a CRVFO petroleum engineer shall be notified for further instruction within 48 hours from running the CBL and prior to commencing fracturing operations.

A greater volume of cement may be required to meet the 200-foot cement coverage requirement for the Williams Fork Formation/Mesaverde Group. Williams shall evaluate the top of cement on the first cement job on the pad. If cement is below the 200-foot cement coverage requirement, the cement volume shall be adjusted to compensate for low cement coverage.

A Production casing centralizer program will maintain a 67% standoff. The centralizer program will have 1 centralizer every other joint through the vertical section and 1centralizer per joint through the tangent (build/drop) sections of the well.
13. On the first well drilled on this pad, a triple combo open hole log shall be run from the base of the surface borehole to surface, and from TD to bottom of surface casing shoe. This log shall be in accordance with 19 CFR 3162.4(b), which states that the operator shall submit a complete set of electrical/mechanical logs in .pdf/.las format with standard Form 3160-4, Well Completion or Recompletion Report and LOG. Contact the CRVFO geologist at 970-876-9053 for clarification.
14. Submit the (a) mud/drilling log (e.g. Pason disc), (b) driller's event log/operations summary report, (c) production test volumes, (d) directional survey, and (e) Pressure Integrity Test results with the well completion report. Contact Will Howell for clarification.