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

ENVIRONMENTAL ASSESSMENT

NUMBER: BLM-CO-140-2008-130EA

CASEFILE NUMBER: Federal Lease COC 24099

PROJECT NAME: Proposal to Drill Two Federal Wells on Existing Fee Pad GM 214-33, Drill Two Federal Wells on Existing Fee Pad 32-32, and Dispose of Drill Cuttings on Five Existing Fee Pads.

LOCATION: Sections 28, 29, 32, and 33, Township 6 South, Range 96 West, Sixth Principal Meridian, Garfield County, Colorado (see Figure 1).

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

Table 1. Surface and Bottomhole Locations of Proposed Federal Wells

Well Pad	*Proposed Wells*	*Surface Locations*	*Bottomhole Locations*
GM 214-33	GM 312-33	NWNW Sec. 33 T6S R96W 1110 ft. FNL 222 ft. FWL	SWNW Sec. 33 T6S R96W 1701 ft.FNL 192 ft. FWL
	GM 412-33	NWNW Sec. 33 T6S R96W 1149 ft. FNL 245 ft. FWL	SWNW Sec. 33 T6S R96W 2378 ft. FNL 159 ft. FWL
GR 32-32	GM 342-32	SWNE Sec. 32 T6S R96W 1502 ft. FNL 1706 ft. FEL	SENE Sec. 32 T6S R96W 2393 ft. FNL 1175 ft. FEL
	GM 42-32	SWNE Sec. 32 T6S R96W 1497 ft. FNL 1700 ft. FEL	SENW Sec. 32 T6S R96W 1516 ft. FNL 416 ft. FEL
Well Pad/Cuttings Pit	***Surface Location***		
GR 14-28	SWSW Sec. 28 T6SR96W		
GM 204-29	SESE Sec. 29 T6SR96W		
MV 41-32	NENE Sec. 32 T6SR96W		
GM 31-32	NWNE Sec. 32 T6SR96W		
GM 22-32	SENW Sec. 32 T6SR96W		

APPLICANT: Williams Production Company RMT ("Williams")

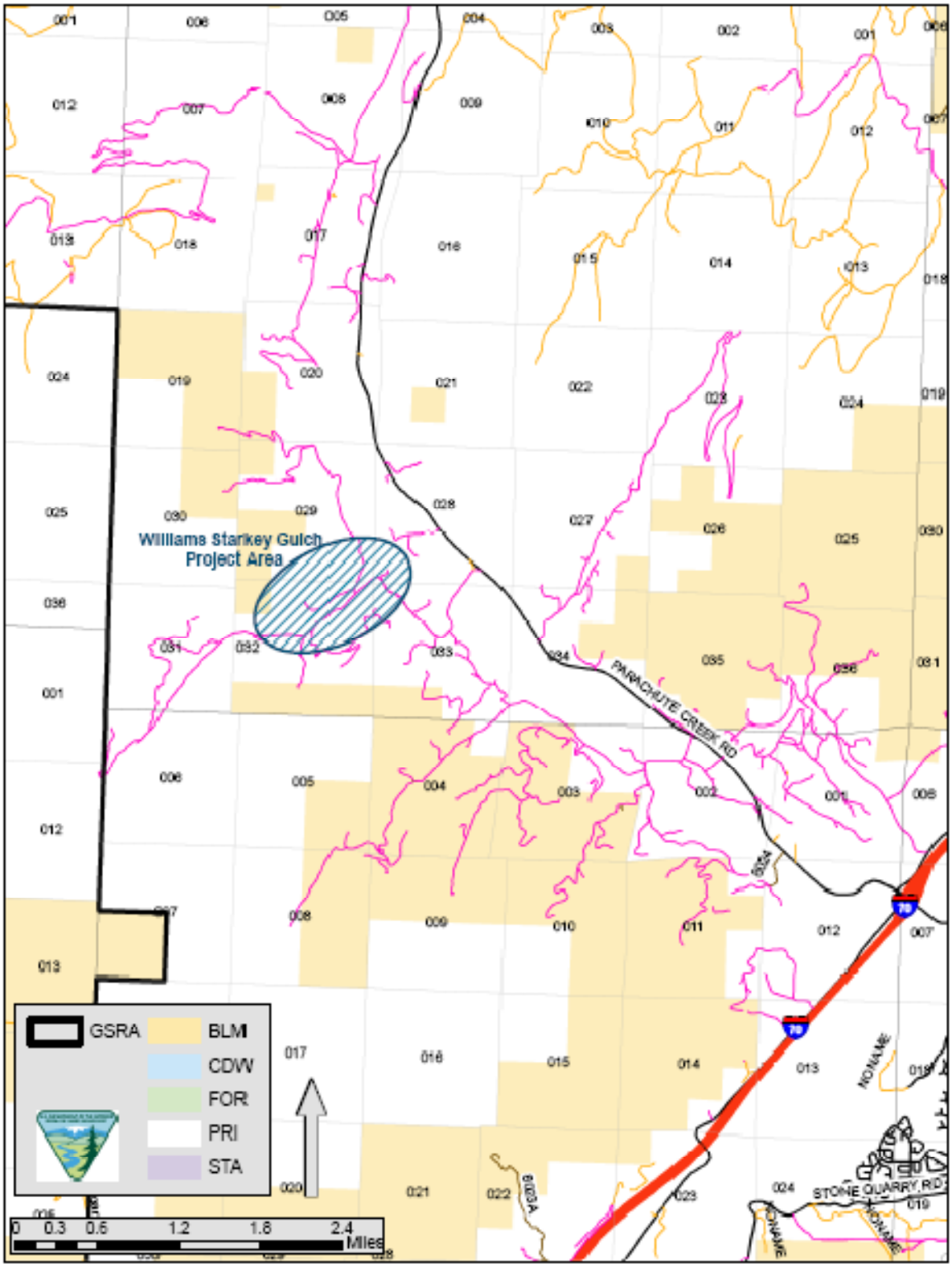

Figure 1. Starkey Gulch Project Location.

DESCRIPTION OF THE PROPOSED ACTION AND NO ACTION ALTERNATIVE

Proposed Action

The proposed action is to drill and develop two Federal oil and gas wells from existing well pad GR 32-32, drill and develop two Federal oil and gas wells from existing well pad GM 214-33, and develop five pads for the purpose of cuttings disposal (Figure 2). All well pads are located on private surface. The wells would be directionally drilled from the proposed locations into Federal Lease COC24099. In addition, there are two fee wells (GM 421-33 and GM 512-33) proposed for drilling from the GM 214-33 pad and one fee well (GM 332-32) proposed for drilling from the GR 32-32 pad.

The reconstructed GM 214-33 pad would be approximately 200 feet x 290 feet (1.33 acres), with a total disturbance of approximately 2.31 acres, which would be reduced to approximately 0.83 acres after interim reclamation. The reconstructed GR 32-32 pad would be 200 feet x 270 feet at the widest portion of the pad and approximately 140 feet x 270 feet at the narrowest portion of the pad. The pad will cover approximately 1.11 acres, with a total disturbance of approximately 1.5 acres, which would be reduced to approximately 0.83 acres after interim reclamation.

The five cuttings pits are proposed to be located on existing pads GR 14-28, GM 204-29, MV 41-32, GM 31-32, and GM 22-32 in the Starkey Gulch area. The well pads are located on private surface and the pits would be placed within the original limits of disturbance. The GR 14-28 pad would have a total disturbance of approximately 1.97 acres. The GM 204-29 pad would have approximately 0.83 acres of disturbance, pad MV 41-32 would have approximately 0.50 acres of disturbance, pad GM 31-32 would have approximately 0.69 acres of disturbance, and pad GM 22-32 would have approximately 0.31 acres of disturbance.

The proposed project area is located 6 miles northwest of Parachute, Colorado in Starkey Gulch. The area is presently accessed using Garfield County Road 215/Parachute Creek Road. Access to the well and cuttings pads from Parachute Creek Road is via existing private roads established for natural gas development. A rerouted road would access the northwest corner of the GM 214-33 pad, with disturbance to be approximately 0.04 acres. These existing roads would be maintained to an appropriate standard no higher than necessary to accommodate their intended functions, as described in the *Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development* (BLM and USFS, 2006b) and BLM Handbook H-9113-1 *Roads Manual* or as determined by the private land owner.

The proposed action would include drilling and completion operations, production of natural gas, use of pipelines, and intermediate and final reclamation measures. Production equipment (tanks, separators, wellheads, metering, remote monitoring equipment, combustion unit, produced water pump, etc.) would be installed on the drilling pads.

The proposed action would be implemented consistent with Federal oil and gas leases COC24099, Federal regulations (43 CFR 3100), and the operational measures included in the Applications for Permit to Drill (APDs) or attached to the APDs as Conditions of Approval (COAs). The COAs to be applied to this project are presented in Appendices A and B.

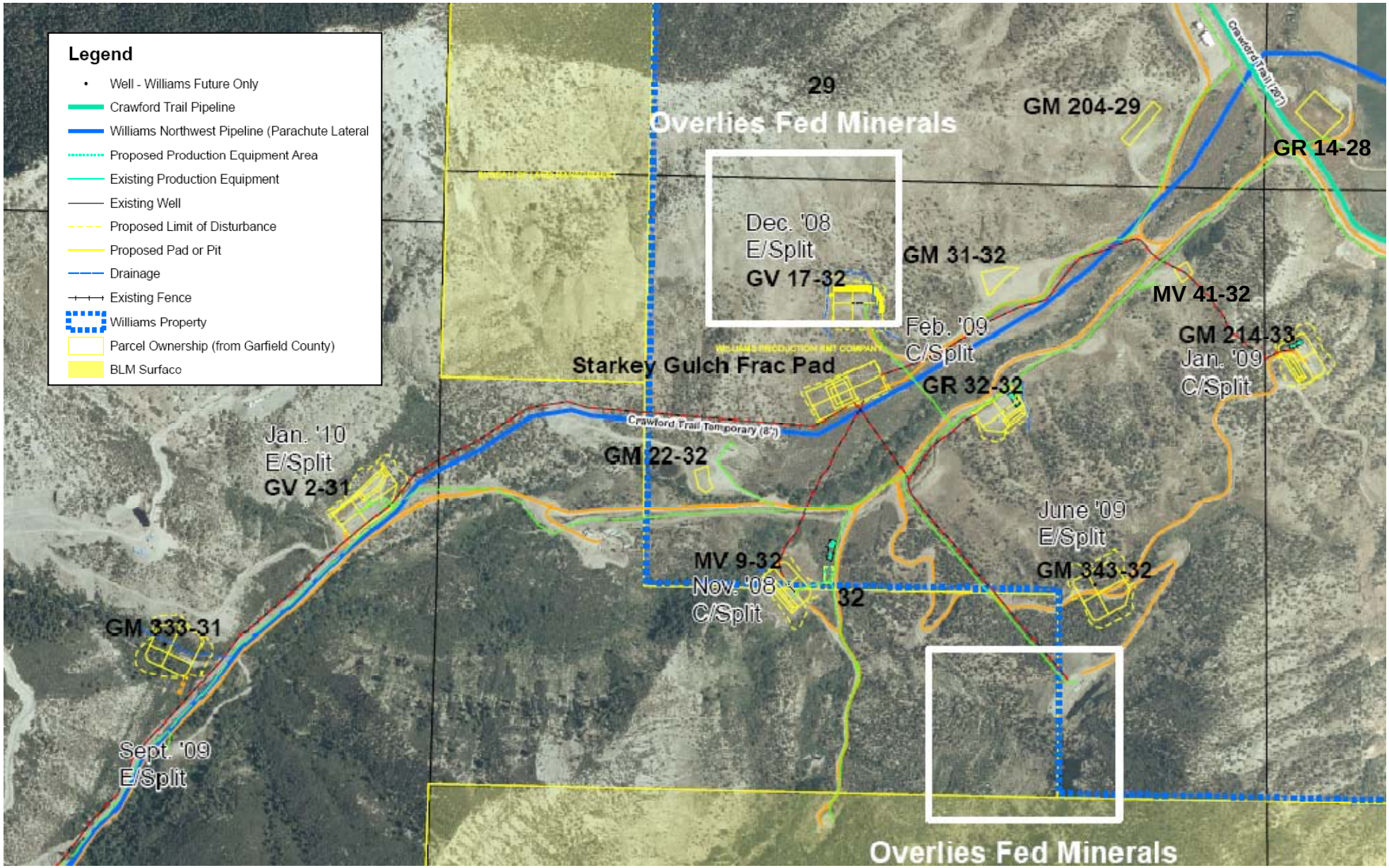

Figure 2. Williams Starkey Gulch Well Pads and Cuttings Locations

No Action Alternative

The proposed action involves Federal subsurface minerals that are leased. These Federal leases grant the lessee the right to explore and develop the lease. Although BLM cannot deny the right to drill and develop the leasehold, individual APDs can be denied to prevent unnecessary and undue degradation. The no action alternative constitutes denial of the APDs associated with the proposed action.

However, three fee wells are also included in the proposed action, two to be drilled from the 214-33 pad and one from the 32-32 pad. Under the no action alternative, these three fee wells would still be drilled, and thus the expansion of these two pads would still occur. The GR 14-28 cuttings pit would also be required. As a result, the no action alternative consists of a decrease in redisturbed area of approximately 2.33 acres since the four smallest of the five cuttings pits would not be required. The total areal disturbance in the no action alternative thus constitutes an approximate 28% decrease compared to the proposed action. Since four of the seven proposed wells would not be drilled in the no action alternative, the drilling, completion, and production phases would involve an approximate 57% decrease in activity and vehicle traffic compared to the proposed action.

PURPOSE AND NEED FOR THE ACTION

The purpose of the action is to develop oil and gas resources on Federal Lease COC24099 consistent with existing Federal lease rights. The action is needed to increase the development of oil and gas resources for commercial marketing to the public.

SUMMARY OF LEASE STIPULATIONS

Federal Lease 24099 has no specific stipulations. However, the BLM can enforce Conditions of Approval (COAs) on individual APDs to protect important resource values.

PLAN CONFORMANCE REVIEW

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

Name of Plan: Glenwood Springs Resource Management Plan (BLM 1984).

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

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

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

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

STANDARDS FOR PUBLIC LAND HEALTH

In January 1997, Colorado BLM approved the Standards for Public Land Health. The five standards cover upland soils, riparian systems, plant and animal communities, threatened and endangered species, and water quality. Standards describe conditions needed to sustain public land health and relate to all uses of the public lands. The environmental analysis must address whether the proposed action or alternatives being analyzed would result in impacts that would maintain, improve, or deteriorate land health conditions relative to these resources.

These analyses are conducted in relation to baseline conditions described in land health assessments (LHAs) completed by the BLM. The proposed action would be located in an area that is included in the Rifle West LHA (BLM 2005).

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. Some of the critical elements that require inclusion in this EA are not present; others may be present but would not be affected by the proposed action and alternative (Table 3). Only the mandatory critical elements that are present and affected are described in the following narrative.

Table 3. Critical Elements of the Human Environment

Critical Element	*Present*		*Affected*		*Critical Element*	*Present*		*Affected*	
	Yes	No	Yes	No		Yes	No	Yes	No
Air Quality	X		X		Prime or Unique Farmlands		X		X
ACECs		X		X	Special Status Species*	X		X	
Cultural Resources		X		X	Wastes, Hazardous or Solid	X		X	
Environmental Justice	X			X	Water Quality, Surface and Ground*	X		X	
Floodplains		X		X	Wetlands and Riparian Zones*		X		X
Invasive, Non-native Species	X		X		Wild and Scenic Rivers		X		X
Migratory Birds	X		X		Wilderness and Wilderness Study Areas		X		X
Native American Religious Concerns		X		X					

* Public Land Health Standard

In addition to the mandatory critical elements are other resources that would be affected by the proposed action and the no action alternative. These are presented under **Other Affected Resources.**

Critical Elements

Air Quality

Affected Environment

The project area lies within Garfield County which has been described as an attainment area under Colorado Ambient Air Quality Standards (CAAQS) and National Ambient Air Quality Standards (NAAQS). An attainment area is an area where ambient air pollution quantities are below (i.e., better than) NAAQS standards.

Environmental Consequences

Proposed Action

The Roan Plateau Resource Management Plan Amendment (RMPA) and Environmental Impact Statement (EIS) describe potential effects from oil and gas development (BLM 2006:4-26 to 4-37). Analysis was completed with regard to greenhouse gas emissions, a near-field and far-field analysis for "criteria pollutants" (particulate matter [PM_{10} 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, the implementation of oil and gas development under the Roan Plateau RMPA and EIS would have either no or negligible long-term adverse impacts on air quality. Since the proposed action is within the scope of the reasonable foreseeable development (RFD) scenario analyzed in that document, it is anticipated that the proposed action would be unlikely to have adverse effects on air quality.

Activities described in the proposed action would result in localized short-term increases in emissions from vehicles and drilling equipment and fugitive dust 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/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, Number 2).

Since the Roan Plateau RMPA/EIS was approved, ongoing scientific research has identified the potential impacts of anthropogenic "greenhouse gas" (GHG) emissions and their effects on global climatic conditions. These anthropogenic GHGs include carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and several trace gases, as identified by the Intergovernmental Panel on Climate Change (IPCC). Through complex interactions on a global scale, these GHG emissions 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 (2006) 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 greenhouse gas concentrations."

The assessment of GHG emissions and climate change is an ongoing scientific endeavor. Many existing climate prediction models are global in nature. Climate change science is rapidly advancing and is increasingly able to predict likely future conditions at regional levels. However, scientific uncertainty remains, and the lack of proven scientific tools designed to predict climate change on local scales limits the ability to project potential future impacts of climate change of individual projects.

Although the current project will likely contribute to future emissions of GHGs to the atmosphere, there currently is no scientific tool that allows the translation of specific quantities of emissions from a particular activity into a change in average annual global surface temperature or a change.

No Action Alternative

Under the no action alternative, the Federal components included in the proposed action would not be approved and constructed, but drilling of the three fee wells would still occur. This would involve an approximate 28% decrease in construction activity and 57% decrease in drilling, completion, and production activity and traffic. The resulting air quality impacts would thus lie somewhere between a 28% and a 57% decrease compared to those generated by the proposed action.

Cultural Resources

Affected Environment

Several recent Class III cultural resource inventories (GSFO# 1108-16 and 1107-33) were conducted for the Starkey Gulch area and included these pad locations. Additionally, five other cultural inventories (GSFO# 1107, 1285A, 1164, 1257 and 94105) took place in and around the current project area. No properties that are considered eligible for listing on the National Register of Historic Places were identified in this project area. Therefore, no formal consultation with the Colorado State Historic Preservation Officer (SHPO) was needed and a determination of "**No Historic Properties Affected**" was made in accordance with the National Historic Preservation Act (NRHP), as amended (16 USC 470f), National BLM/SHPO Programmatic Agreement (1997), and Colorado Protocol (1998).

Environmental Consequences

Proposed Action

There would be no direct impacts to cultural resources from the implementation of the proposed actions. However, indirect long-term cumulative impacts from increased activity and the presence of project personnel could result in a range of impacts to known and undiscovered cultural resources in the vicinity of the project 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 Williams and its contractors, including informing them of their responsibilities to protect and report any cultural resources encountered during drilling and development operations.

No Action Alternative

Under this alternative, the four federal wells would not be drilled, though the two private pads and short section of rerouted access road would still be constructed/reconstructed for the three proposed fee wells. Additionally, one cuttings pit would still be constructed. Therefore, many of the same direct impacts as described for the proposed action would occur without the mitigation measures, and cultural resources in the general area would remain vulnerable to damage from illegal activities. The standard Education/Discovery COA for cultural resource protection would not be attached to the permit, though the Colorado State Statute CRS 24-80-1301 for Historic, Prehistoric, and Archaeological Resources, and for Unmarked Human Graves would apply.

Invasive Non-native Species

Affected Environment

The existing pads are located within open juniper (*Juniperus osteosperma*) woodland interspersed with various saltbush species. Numerous non-native species are present on the pads such as kochia (*Kochia scoparia*), Russian thistle (*Salsola australis*), clasping pepperweed (*Lepidium perfoliatum*), perennial pepperweed (*L. latifolium*), and tumble mustard (*Sisymbrium altissimum*).

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 these species are present in the project area, the potential for invasion following construction activities is high. Mitigation measures designed to minimize the spread of these species would be attached to well APDs as conditions of approval (see Appendix A).

No Action Alternative

Under the no action alternative, federal wells would not be drilled, though the two private pads and short section of rerouted access road would still be constructed for the three proposed fee wells. Additionally, one cuttings pit on a private pad would still be constructed. Therefore, many of the same direct impacts as described for the proposed action would occur without the mitigation measures.

Migratory Birds

Affected Environment

The project area supports a diverse community of trees, shrubs, forbs, and grass species. The pinyon-juniper understory is vegetated with species such as galleta grass, Indian ricegrass, and bottlebrush squirreltail. A number of the side drainages and Starkey Gulch are densely vegetated with riparian species including narrowleaf cottonwood, box-elder, mountain maple, and willow. These diverse vegetation types provide cover, forage, and nesting habitat for a variety of migratory birds. A few species on the U. S. Fish and Wildlife Service (USFWS) 2002 list of Birds of Conservation Concern (BCC) may occur in the area. These include the pinyon jay (*Gymnorhinus cyanocephalus*), gray vireo, black-throated gray warbler (*Dendroica nigrescens*), Virginia's warbler (*Vermivora virginiae*) and Lewis's woodpecker (*Melanerpes lewis*). Other species that are not on the BCC list but associated primarily with this habitat

type include residents such as the juniper titmouse and Townsend's solitaire and migrants such as the blue-gray gnatcatcher.

Nesting habitat for the golden eagle (*Aquila chrysaetos*) and peregrine falcon (*Falco peregrinus*), both considered by the USFWS as a Bird of Conservation Concern (BCC), is found in the high cliffs that characterize the Parachute Creek drainage and Starkey Gulch. Nesting habitat for non-BCC species such as the Cooper's hawk (*Accipiter cooperii*) and red-tailed hawk (*Buteo jamaicensis*) is found in the mature narrowleaf cottonwood, box-elder, and Douglas-fir stands found along the many nearby drainages. Five species of owls, the western screech-owl (*Otus kennicottii*), northern pygmy-owl (*Glaucidium gnoma*) great horned owl (*Bubo virginianus*), northern saw-whet owl (*Aegolius acadicus*) and long-eared owl (*Asio otus*) may also use nearby cliffs, riparian, and forested habitat for nesting or foraging.

Raptor and BCC surveys were conducted within a 0.25-mile area of the pad and road locations in 2007 and 2008. Two Cooper's hawk nests found during 2007 were surveyed again in 2008 and both were found to be inactive. Both of these nests are greater than 0.25 mile from project activities. No other raptor nests, including those of BCC-listed species, were found during the surveys.

Environmental Consequences

Proposed Action

Because the pads already exist and would only be reconstructed with minimal new surface disturbance, the loss of potential habitat would be limited to approximately 2 acres. The greater effect would occur during construction and completion activities when habitat effectiveness would be reduced as a result of development activity. It is possible that during the well development phase, individual birds could be displaced to adjacent habitats due to noise and human activity. Effects of displacement could include increased risk of predation or reproduction failure if adjacent habitat is at carrying capacity or if disturbance leads to nest abandonment. Impacts would likely be temporary (<3 years) but some disturbance-related effects could occur during the production and maintenance phase of the project.

The development of reserve pits may attract waterfowl and other migratory birds for purposes of resting, foraging, or as a source of water. Contact with produced water and drilling and completion fluids has the potential to cause death and injury (e.g., acute or chronic toxicity, compromised insulation). Based on this potential, birds should be prevented from accessing the reserve pit. Mitigation measures designed to limit access to reserve pits are presented Appendix A.

No Action Alternative

Under the no action alternative, three fee wells would be developed and the expansion of two pads would still occur. Only one of the five cuttings pit would be required. As a result, less human activity and fewer acres of redisturbed ground should provide a proportional decrease in potential impacts to migratory birds.

Native American Religious Concerns

Affected Environment

The Ute Indian Tribes claim this area as part of their ancestral homeland. At present, no Native American concerns are known within the project area and none were identified during the cultural resource records search or inventories. The Ute Tribe of the Uintah and Ouray Bands, the primary Native American tribe in this area of the Glenwood Springs Field Office, 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.

Environmental Consequences

Proposed Action

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

A Standard Education/Discovery Condition of Approval (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 Williams and its contractors, including informing them of their responsibilities to protect and report any cultural resources encountered.

No Action Alternative

The impacts of the no action alternative would be reduced but not eliminated. Indirect impacts from increased access and personnel in the vicinity of the proposed project could result in impacts to unknown Native American resources ranging from illegal collection to vandalism.

The standard Education/Discovery COA for cultural resource protection would not be attached to the permit, though the Colorado State Statute CRS 24-80-1301 for Historic, Prehistoric, and Archaeological Resources, and for Unmarked Human Graves would apply.

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

Affected Environment

Federally Listed, Proposed, or Candidate Plant Species

According to the latest species list from the U. S. Fish and Wildlife Service (USFWS) (http://mountain-prairie.fws.gov/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: Uinta Basin hookless cactus (*Sclerocactus glaucus*), Parachute beardtongue (*Penstemon debilis*), Ute's ladies tresses (*Spiranthes diluvialis*), and DeBeque phacelia (*Phacelia submutica*).

The results of a June 2008 plant survey indicate the project area contains no federally listed, proposed, or candidate plant species or suitable habitat for these species.

BLM Sensitive Plant Species

BLM sensitive plant species with habitat and/or occurrence records in Garfield County include adobe thistle (*Cirsium perplexans),* DeBeque milkvetch (*Astragalus debequaeus),* Naturita milkvetch (*Astragalus naturitensis),* Roan Cliffs blazing star (*Mentzelia rhizomata*), Piceance bladderpod (*Lesquerella parviflora*), and Harrington's penstemon (*Penstemon harringtonii*).

The results of a June 2008 inventory indicate soils and habitat appear suitable for adobe thistle; however, no sensitive plants were observed during surveys in the project area. Adobe thistle is found in barren clay

outcrops derived from shales of the Mancos or Wasatch formations on open and disturbed sites in mixed shrubland and pinyon-juniper woodland, at elevations of 5,000 to 8,000 feet.

Federally Listed, Proposed, or Candidate Animal Species

According to the current species list available online from the U. S. Fish and Wildlife Service (http://mountain-prairie.fws.gov/endspp/CountyLists/COLORADO.pdf), the following Federally listed, proposed, or candidate plant and animal species may occur within or be impacted by actions occurring in Garfield and Mesa Counties: Canada lynx (*Lynx canadensis*), Mexican spotted owl (*Strix occidentalis*), yellow-billed cuckoo (*Coccyzus americanus*), razorback sucker (*Xyrauchen texanus*), Colorado pikeminnow (*Ptychocheilus lucius*), bonytail chub (*Gila elegans*), and humpback chub (*Gila cypha*). The bald eagle (*Haliaeetus leucocephalus*) was removed from the Federal list of threatened or endangered species in August 2007. The BLM now considers the bald eagle a sensitive species.

BLM Sensitive Animal Species

BLM sensitive animal species with habitat and/or occurrence records in the area include milk snake (*Lampropeltis triangulum taylori*), midget faded rattlesnake (*Crotalus viridis concolor*), and Great Basin spadefoot (*Spea intermontana*). In addition, four BLM sensitive fish species—the flannelmouth sucker (*Catostomus latipinnis*), bluehead sucker (*Catostomus discobolus*), roundtail chub (*Gila robusta*), and Colorado River cutthroat trout (*Oncorhynchus clarki pleuriticus*)—are known to inhabit the Colorado River.

Environmental Consequences

Proposed Action

Federally Listed, Proposed, or Candidate Plant Species

The project area contains no federally listed, proposed, or candidate plant species or suitable habitat for these species. Therefore, the proposed action would have "**No Effect**" on these species.

BLM Sensitive Plant Species

The project area contains no sensitive plants, but habitat appeared suitable for the adobe thistle. Impacts to the potential habitat could result from noxious weed invasion following soil disturbing activities proposed for the project area. Noxious weeds are aggressive and develop dense stands that tend to outcompete native plants. Mitigation measures to address this potential indirect impact are described in Appendix A.

Federally Listed, Proposed, or Candidate Animal Species

With the exception of listed fish species, habitat for federally listed, proposed, or candidate animal species does not occur within or adjacent to the project area. Therefore, the proposed action would have **"No Effect"** on these species.

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.

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.

As part of a Programmatic Biological Opinion (BO) issued in 1994, the USFWS determined that any depletion of flows in the Colorado River Basin represent a "**May Affect, Likely to Adversely Affect**" determination for individual projects. The Programmatic BO, which allows BLM to authorize projects with water depletions of less than 125 acre-feet per year, was written to remain in effect until a total depletion threshold of 2,900 acre-feet per year is reached. An amendment to that BO in 2000 revised the threshold to 3,000 acre-feet per year. The BLM and USFWS are currently nearing completion of a new BO to cover anticipated additional depletions beyond the currently specified threshold. In the meantime, depletions associated with the current project would be well below the 125 acre-feet threshold for individual projects and within the current BO.

BLM Sensitive Animal Species

Parachute Creek, located within a half mile of the proposed action, provides bald eagle winter foraging and roosting habitat. In the vicinity of the project area, a large amount of commercial development is in place to support the high number of oil and gas wells in the area. As such, the additional disturbance associated with the proposed action is not expected to increase impacts to the already heavily developed winter habitat. Therefore, no impacts to bald eagle are expected.

Direct impacts to the BLM sensitive reptile and amphibian species could include injury or mortality as a result of proposed developments and subsequent production and maintenance activities. These effects would be most likely during the active season for these species, which are April to October for the milk snake, March to October for the midget faded rattlesnake, and May through September for the Great Basin spadefoot. Indirect effects to the milk snake and midget faded rattlesnake could include a greater susceptibility to predation if the roads or pads are used to aid in temperature regulation. Overall, however, there is a low likelihood that these species would be measurably affected.

Well pad construction would disturb soil and remove vegetation, increasing the potential for erosion and increased sedimentation to the Colorado River. Although Colorado River cutthroat trout are especially sensitive to increased sediment loads that can potentially impair preferred spawning habitats, Parachute Creek and the Colorado River are not considered spawning habitat. Sediment may reduce aquatic insect productivity that could impact food resources for trout and other wildlife. However, given that high sediment loads occur naturally, any change in productivity would likely be undetectable.

The discussion of potential impacts described above for the endangered Colorado River fishes is also relevant to the nongame fishes listed as sensitive by the BLM. Because mitigation measures would be implemented (Appendix A), it is unlikely that the proposed action would cause unnatural sediment loads in nearby streams, including the Colorado River. Depletions in flow volumes would also not be of a magnitude that would affect the BLM sensitive fish species. Therefore, no discernible impacts to these species are expected.

No Action Alternative

Federally Listed, Proposed, or Candidate Plant Species

The no action alternative would not cause impacts to any federally listed, proposed, or candidate plants because these species do not occur in the area to be affected.

BLM Sensitive Plant Species

Under the no action alternative, the federal wells would not be drilled, and impacts to sensitive plants would be reduced but not eliminated. Indirect impacts from increased access and personnel while drilling the fee wells in the vicinity of the proposed project could result in impacts to BLM sensitive plant species.

BLM Sensitive Animal Species and Federally Listed, Proposed, or Candidate Animal Species

Under the no action alternative, three fee wells would be developed and the expansion of two pads would still occur. Only one of the five cuttings pit would be required. As a result, less human activity and fewer acres of redisturbed ground would provide a proportional decrease in potential impacts.

Analysis on the Public Land Health Standard for Special Status Species: According to a recent land health assessment, habitat conditions within this area appear suitable for special status animal species known or likely to occur (BLM 2005). However, large portions of the landscape are being fragmented due to extensive natural gas development. Continued habitat fragmentation is of concern as 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. Although the contribution of the proposed action is in itself small, it may further trend the area away from meeting Standard 4 for special status wildlife.

No potential habitat for federally listed plant species is present in the project area; however, habitat appears suitable for the BLM sensitive plant, adobe thistle. Ground-disturbing activities connected to the proposed action will likely contribute to degradation of the sensitive plant habitat, resulting in trending the area away from meeting Standard 4 for special status plants.

Wastes, Hazardous or Solid

Affected Environment

BLM Instruction Memoranda numbers WO-93-344 and CO-97-023 require that all National Environmental Policy Act documents list and describe any hazardous and/or extremely hazardous materials that would be produced, used, stored, transported, or disposed of as a result of a proposed project. The Glenwood Springs Resource Area, Oil & Gas Leasing and 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 which would accompany any authorization resulting from this analysis. The most pertinent of the Federal laws dealing with hazardous materials contamination are as follows:

- The Oil Pollution Act (Public Law 101-380, August 18, 1990) prohibits discharge of pollutants into waters of the 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 (CERCLA) (Public Law 96-510 of 1980) provides for liability, compensation, cleanup, and emergency response for hazardous substances released into the environment. It also provides national, regional, and local contingency plans. Applicable emergency operations plans in place include the National Contingency Plan (40 CFR 300, required by section 105 of CERCLA), the Region VIII Regional Contingency Plan, the Colorado River Sub-Area Contingency Plan (these three are Environmental Protection Agency produced plans), the Mesa County Emergency Operations Plan (developed by the Mesa County Office of Emergency Management), and the BLM Grand Junction Field Office Hazardous Materials Contingency Plan.

- The Resource Conservation and Recovery Act (RCRA) (Public Law 94-580, October 21, 1976) regulates the use of hazardous substances and disposal of hazardous wastes. Note: While oil and gas lessees are exempt from RCRA, right-of-way holders are not. 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 road, pad, and pipeline and for refueling and maintaining equipment and vehicles. Potentially harmful substances used in construction and operations 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.

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 results in a release of any of these materials. A release could result in contamination of surface water or soil. Improper casing and cementing procedures could result in the contamination of groundwater resources. In the case of any release, emergency or otherwise, the responsible party would be liable for cleanup and any damages. Depending on the scope of the accident, any of the above referenced contingency plans would be activated to provide emergency response. At a minimum, the BLM Grand Junction Field Office contingency plan would apply.

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

No Action Alternative

Under the no action alternative, the Federal components included in the proposed action would not be approved and constructed, but drilling of the three fee wells would still occur. This would involve an approximate 57% decrease in drilling, completion, and production activity and traffic. Since the large majority of hazardous waste contamination risk occurs during the drilling, completion, and production phases, the risk of hazardous waste contamination in the no action alternative would be approximately 50% less than the risk generated by the proposed action.

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

Surface Water

Affected Environment

Proposed activities would be located within an unnamed, 19,804-acre sub-watershed within the larger (5^{th} code) Parachute Creek Watershed. Starkey Gulch drains the largest area within this sub-watershed. All proposed activity is in the Starkey Gulch drainage, and one area of disturbance (the cuttings pit on the GM 22-32 pad) will be within 60 feet of Starkey Gulch.

According to the *Stream Classifications and Water Quality Standards* (CDPHE, Water Quality Control Commission [WQCC] Regulation No. 37) (CDPHE 2007), Starkey Gulch and the other ephemeral drainages within this watershed are within segment 4a that includes all tributaries to the Colorado River from the confluence with the Roaring Fork River to a point immediately below the confluence with Parachute Creek. Following is a brief description of segment 4a.

- Segment 4a – This segment has been classified aquatic life cold 2, recreation 2, water supply, and agriculture. Aquatic life cold 2 indicates that this water course is not capable of sustaining a wide variety of cold or warm water biota due to habitat, flows, or uncorrectable water quality conditions. Recreation class 2 refers to waters that are not suitable or intended to become suitable for primary contact recreation. This segment is, however, suitable or intended to become suitable for potable water supplies and agricultural purposes that include irrigation and livestock use. At this time, there are no water quality data for these unnamed ephemeral drainages.

These drainages are not currently on the State of Colorado's *Stream Classifications and Water Quality Standards* (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). At this time, no water quality data are available for these drainages.

Environmental Consequences

Proposed Action

Potential impacts to surface water associated with the proposed action include increased erosion and sedimentation of streams and changes in channel morphology due to pad expansion, 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 30 to 45 days per well. 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, the access road would remain in place over the life of the well pad (i.e., 20 to 30 years) and would channel runoff during periods of precipitation. Sedimentation and stream channel impacts associated with the drilling pads, access roads, and pipeline installation would be reduced through the implementation of Best Management Practices (BMPs) and other preventive measures. As proposed, these measures would include limiting cut slope steepness, step-cutting, limiting road grade to 10%, crowning road surface, and installing culverts and drainage systems, as well as interim reclamation practices following the production phase of the proposed action.

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. The reserve pit used to contain drilling fluids would be lined to prevent infiltration into surrounding soils. A minimum of 2 feet of freeboard would be maintained in the reserve pit. Freeboard is measured from the highest level of drilling fluids and cuttings in the reserve pit to the lowest surface elevation of ground at the reserve pit perimeter. Once completion operations are complete, excess liquids would be allowed to evaporate and backfilling of the pit would be performed in a manner that would avoid incorporating the mud into surface soils.

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 constructed to transport these liquids would be pressure tested to detect leakage prior to use.

Refer to Appendix A for standard COAs that would mitigate impacts to Surface Water. Through the use of COAs and BMPs associated with construction activities, prompt interim reclamation, and the implementation of the preventative measures associated with the treatment of fluids, impacts to surface waters would be minimized and should be minor.

No Action Alternative

This alternative would continue to have potential impacts on surface water if Colorado Oil and Gas Conservation Commission (COGCC) issued APDs for the three fee wells planned on the two existing pads. During the construction phase, the potential for impacts in this alternative would be approximately 30% less than those of the proposed action since pad expansion and construction of the largest cuttings pit would still occur, as well as possible pipeline installation. During the drilling, completion, and production phase, the potential impacts would be approximately 60% less than the proposed action since the four Federal wells would not be drilled.

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

The proposed action would not include any intentional deposition of fill into Starkey Gulch or its larger tributaries due to construction activities, although the southern edge of the cuttings pit on the GM 22-32 pad will be within 60 feet of Starkey Gulch. The GM 32-32 pad has already filled and diverted a small, unnamed, ephemeral tributary to the ephemeral Starkey Gulch, and the proposed action would not involve any additional fill or re-diversion of this drainage. There is a small potential for stormwater runoff to enter Starkey Gulch or its tributaries due to construction activity, but proper implementation of BMPs, as discussed elsewhere in the sections on Water Quality and Soils, should eliminate this risk.

No Action Alternative

This alternative would continue to pose a small potential risk to waters of the U.S. if COGCC issued APDs for the three fee wells planned on the proposed pads. The potential impact would be approximately 25% to 30% less than the impact of the proposed action since expansion of the existing drilling pads, construction of the largest cuttings pit, and possible pipeline installation would still occur.

Groundwater

Affected Environment

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

The project area is in the lower Piceance Basin aquifer system. The Piceance Basin contains both alluvial and bedrock aquifers. Unconsolidated alluvial aquifers are the most productive aquifers in the Piceance Basin. The groundwater exists in shallow, unconsolidated alluvium associated with the Colorado River (BLM 2006) and consists of unconsolidated boulders, cobbles, gravel, sand, silt, and clay. The thickness of the alluvium is variable, but tends to be thinner in the upper reaches and thicker in the lower reaches. Generally, alluvial well depths are less than 200 feet and typically water levels range from 50 to 100 feet. The quality of alluvial groundwater in the Colorado River Basin can vary widely, and is affected by return flow quality, mineral weathering and dissolution, cation-anion exchange with alluvial minerals, and organic compound loading from fertilizer and pesticide leaching.

The most important bedrock aquifers are known as the upper and lower Piceance Basin aquifer systems. These consolidated bedrock aquifers occur within and above the large oil shale reserves. The upper and lower aquifers are separated by the Mahogany Zone of the Parachute Creek Member of the Tertiary Green River Formation. The Mahogany Zone is a poorly permeable oil shale, which effectively serves as an aquitard. Both bedrock aquifers overlie the older Cretaceous Mesaverde Group, the target zone of the subject wells. South of the Colorado River, these upper Tertiary-age aquifers have largely been eroded off, exposing the lower Green River and Wasatch Formations. The surface formation of the GR 32-32 well pad is both the Lower part of the Green River Formation (Tgl) and the Wasatch Formation (Two). According to the COGCC website, the dividing line between the two formations splits the GR 32-32 pad in two. The Wasatch Formation underlies the north end of the pad, and the Green River Formation outcrops on the south portion of the pad. The surface formation of the GM 214-33 well pad is the Wasatch Formation.

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

According to the CDWR, no fresh-water wells are located within a 0.5- mile radius of either of the well pads. Five fresh water wells have been identified within a 1-mile radius of the GR 32-32 well pad, with the closest approximately 3,700 feet northeast of the proposed activities in Section 28. Located approximately 680 feet northeast of that location is a second well, the only other fresh water well located within Section 28. The closer well is a monitoring well with no quantitative data listed, the second well is a stock use well with a well depth of 120 feet, a water level of 25 feet, and yielding 10 gallons per minute (gpm). One water well is identified within Section 29: a domestic well 60 feet deep with a water level of 20 feet, and also yielding 10 gpm. The last two wells identified within the 1-mile radius zone are two very shallow municipal wells registered to Union Oil Company of California. Located approximately 4,800 feet to the east in Section 33, these wells show depths of 89 feet and 90 feet, and water levels of 44 feet and 14 feet, respectively. The 89-foot-deep well shows a water yield of 50 gpm, while the other well shows an augmented water yield of 325 gpm.

No other fresh-water wells have been identified in any other adjacent sections with the exception of those already mentioned, including Section 32 where the GR 32-32 well pad is located. For the GM 214-33 well pad, the closest fresh-water wells are approximately 2,800 feet north, and 2,700 feet east of the proposed activities. Eleven fresh water wells are located within a 1-mile radius of the proposed well sites, with the majority of them found within the east half of Section 33, and further east into Section 34. All of the Section 33 wells are either abandoned or monitoring wells, with the exception of the two municipal wells previously mentioned. The remaining wells were checked for well and water depths, with the deepest of these wells coming in at 120 feet, and water levels averaging between 14 feet and 51 feet. Water yield averaged 10 gpm. No other fresh-water wells were identified within adjacent Sections 27, 3, 4, or 5.

Environmental Consequences

Proposed Action

Potential impacts to groundwater resources from the proposed action would include contamination of the groundwater with produced water, drilling mud, and petroleum constituents. Hydraulic fracturing (fracing) would be incorporated to complete the wells, which would include produced and freshwater mixed with proppants, or propping agents, to stimulate the formation to create fractures that would allow gas to travel more freely from the rock pores where the gas is trapped. Hydrofracturing would be conducted at 5,000 feet or more below ground surface, and would be unlikely to cause impacts to groundwater resources near the surface, such as springs or shallow alluvium. However, isolation of any water bearing zones during installation of the production casing would minimize the effects, as well as cementing the production casing to 200 feet above the top of the Mesaverde Group. It is highly unlikely that any deep groundwater resources would be affected, as the thick impermeable layers of rock at the top of the Williams Fork Formation would prevent water or hydrocarbons from migrating to potable water zones.

No Action Alternative

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

Analysis on the Public Land Health Standard for Water Quality

The proposed action and the no action alternative would be unlikely to prevent Standard 5 from being achieved.

Wetlands and Riparian Zones (includes an analysis of Public Land Health Standard 2)

Affected Environment

No wetlands or areas of riparian vegetation are present within the project area that could potentially be impacted by the proposed action.

Environmental Consequences

Proposed Action

No wetlands or riparian vegetation are present within the project area.

No Action Alternative

The no action alternative would not impact wetlands or riparian zones.

Analysis of the Public Land Health Standard for Riparian Systems

The proposed action and the no action alternative would not likely prevent Standard 2 from being achieved.

Other Affected Resources

In addition to the critical elements, the resources presented in Table 4 (next page) were considered for impact analysis relative to the proposed action and no action alternative. Resources that would be affected by the proposed action and no action alternative are discussed below.

Access and Transportation

Affected Environment

The proposed project area is located 6 miles northwest of Parachute, Colorado in Starkey Gulch. The area is presently accessed from I-70/Parachute/Battlement Mesa exit, using Garfield County Road 215/Parachute Creek Road. A series of private roads established for natural gas production lead to the pad and cuttings locations from Parachute Creek Road. Increased truck traffic would primarily occur along Parachute Creek Road and the private natural gas roads throughout Starkey Gulch.

Environmental Consequences

Proposed Action

The proposed action would result in a substantial increase in truck traffic. The largest increase would be during rig-up, drilling, and completion activities. Data indicate that approximately 1,160 truck trips over a 30-day period would be required to support the drilling and completion of each well (Table 5). Once the wells are producing, traffic would decrease to occasional visits for monitoring or maintenance

activities, and hauling produced water and condensate. Each well may have to be recompleted once per year, requiring three to five truck trips per day for approximately one week.

Table 4. Other Resources Considered in the Analysis			
Resource	***NA or Not Present***	***Present and Not Affected***	***Present and Affected***
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

Table 5. Traffic Associated with Drilling and Completion Activities		
Vehicle Class	***Number of trips per well***	***Percentage of total***
16-wheel tractor trailers	88	7.6%
10-wheel trucks	216	18.6%
6-wheel trucks	452	39.0%
Pickup trucks	404	34.8%
Total	1,160	100.0%
Source: BLM 2006. Note: Trips by different vehicle types are not necessarily distributed evenly during the drilling process. Drilling and completion period is approximately 30 days per well.		

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

No Action Alternative

This alternative would continue to have potential impacts on access and transportation if COGCC issued APDs for the three fee wells planned on the two existing pads. During the construction phase, the potential for impacts in this alternative would be approximately 30% less than those of the proposed action since pad expansion and construction of the largest cuttings pit would still occur, as well as possible pipeline installation. During the drilling, completion, and production phase, the potential impacts would be approximately 60% less than the proposed action since the four Federal wells would not be drilled.

Geology and Minerals

Affected Environment

The project area is located within the southern Piceance Basin, a broad elongate structural basin located at the eastern edge of the Colorado Plateau. The basin is highly asymmetrical and deepest along its eastern side near the White River Uplift, where more than 20,000 feet of sedimentary rocks are present. It is bounded on the north by the Uinta Mountain uplift, on the east by the Grand Hogback Monocline, which lies along the west flank of the White River Uplift, on the southeast by the Gunnison and Uncompahgre Uplifts, and separated from the Uinta Basin to the northwest by the Douglas Creek Arch. Surface exposures in the Piceance Basin are primarily sedimentary rocks of the Green River and Wasatch Formations.

The target zone is the Mesaverde Group, which lies unconformably below the Wasatch Formation. The Mesaverde can be over 7,000 feet in thickness within the Piceance Basin, but within this area is estimated to be approximately 5,000 feet thick. The Mesaverde Group is often called the Mesaverde "Formation" and includes informal subdivisions based on gas productivity characteristics including the barren Ohio Creek, the stacked lenticular, fluvial sandstones, sandy shales, carbonaceous shales and coals of the Williams Fork Formation, and the underlying marine sandstones and shales of the Iles Formation.

The proposed drilling project would target sandstone layers within the Williams Fork (including the Cameo Coal and un-named sandstones) between 3,461 and 6,716 feet TVD. The Williams Fork Formation sandstones are considered "tight" because of their low permeability reservoir characteristics. Individual sandstones are stacked and concentrated into 400-500 foot thick potentially productive sequences, and distributed throughout a vertical interval of about 3,000 feet. Studies of the Rulison Gas Field show that these Williams Fork sandstones have limited horizontal extent, based on the lack of pressure communication between existing wells spaced less than 1,000 feet apart (Vargas 2006).

Environmental Consequences

Proposed Action

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

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

The specific casing depths will vary depending on well location and drilling conditions. To accommodate protection and isolation of usable water zones, 8 5/8-inch surface casing will be set at anticipated depths of 1,100 to 1,200 feet MD, well below the average depth to known aquifers. Cement will be circulated to surface to assure an adequate seal between the pipe and the rock formations. The 4½-inch production casing will be set at total depth of the well and cement volumes will be sufficient to fill the annulus between the rock formations and the exterior of the casing to 200 feet above the top of the Mesaverde. If a water bearing, gas productive, lost circulation or pressured zone is encountered, cement volumes will be adjusted to isolate that zone or zones. This configuration is designed to prevent accidental contamination or leakage of hydrocarbons or fracturing fluids from reaching usable water or other productive zones within the wellbore.

No Action Alternative

Under the no action alternative, ground disturbance associated with drilling and production of the fee wells would still occur. New impacts to the geology and mineral resources would decrease, but would not be eliminated.

Noise

Affected Environment

The proposed action would lie within a rural setting characterized by fairly recent natural gas development activities. Noise levels in the area are presently created by traffic serving existing wells and by ongoing drilling and completion activities. There are no residences within Starkey Gulch. The nearest residence to any activities in the proposed action is located approximately 1,400 feet north of the GR 14-28 pad, in an area already heavily impacted by drilling activities, with at least six existing drilling pads in closer proximity to the residence than is the GR 14-28 pad.

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 location. Drilling activities are subject to noise abatement procedures as defined in the COGCC Rules and Regulations (Aesthetic & Noise Control Regulations), generally a limit of 80 decibels db(A) during the day and 75 db(A) 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 an average construction site

noise level of 65 dB(A) at 500 feet (Table 6), construction noise would equal approximately 59 dB(A) at 1,000 feet. At 1,000 feet, noise levels would approximate those of an active commercial area (EPA 1974).

Table 6. Noise Levels Associated with Typical Construction Equipment

Equipment	*Noise Level (dB(A)*		
	50 feet	*500 feet*	*1,000 feet*
Tractor	80	60	54
Bulldozer	89	69	63
Backhoe	85	65	59
Crane	88	68	62
Air Compressor	82	62	56
Dump Truck	88	68	62
Average (rounded)	**85**	**65**	**59**
Source: BLM 1999b			

Noise impacts from drilling and completion activities would last approximately 45 to 60 days at each well. Noise would occur continuously, 24 hours per day, during the drilling and completion period. Based on a measured noise level of 68 dB(A) at 500 feet, actions associated with drilling and completion would generate approximately 62 dB(A) 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.

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 7, approximately 68 dB(A) of noise (at 500 feet) would be created by each fuel and water truck that travels these roads. Less noise would be created by smaller trucks and passenger vehicles such as pickup trucks and sport utility vehicles. Although the duration of increased noise from this source would be short, it would occur repeatedly during the drilling and completion phases.

Noise impacts would decrease during the production phase. These levels would be less than during the construction phase, but greater than background noise levels. During maintenance and workovers, noise levels would increase above those associated with routine well production. As noted above, the nearest residence is located approximately 1,400 feet north of the GR 14-28 pad, on which a cuttings pit would be constructed in the proposed action. Since nearly all traffic into Starkey Gulch would enter from the south, the additional noise impact on this residence due to the proposed action would be minimal. Additionally, there are no private residences along the county and local roads to the south that are not occupied by Williams' employees.

Traffic noise levels would impact residences located along the Parachute Creek Road, which provides primary access into the area. While exposure to these noise levels is not likely to be harmful, it is likely to be annoying to residents in and around the town of Parachute who live near the Parachute Creek Road. However, the proposed action would generate only a very minor increase in overall traffic along this road.

No Action Alternative

This alternative would continue to have noise impacts if COGCC issued APDs for the three fee wells planned on the two pads. The expected noise impacts during expansion of the drilling pads, construction of the large drilling pit, and possible installation of pipelines would be approximately 25% to 30% less than those impacts generated by the proposed action. During the drilling and completion phase the noise levels would be equal to those of the proposed action, though they would last about 40% as long as in the proposed action since the four Federal wells would not be drilled. Noise impacts generated by maintenance truck traffic during the production phase would also be reduced by about 60% in this alternative relative to the proposed action.

Table 7. Noise Levels Associated with Oil and Gas Production and Development

Equipment Type	*Noise Level at 50 feet (dBA)*	*Noise Level at 500 feet (dBA)*	*Noise Level at 1000 feet (dBA)*	*Noise Level at 2000 feet (dBA)*
Crane	88	68	62	56
Backhoe	85	65	59	53
Pan Loader	87	67	61	55
Bulldozer	89	69	63	57
Fuel and Lubrication Truck	88	68	62	56
Water Truck	88	68	62	56
Motor Grader	85	65	59	53
Vibrator/Roller	80	60	54	48
Mechanic Truck	88	68	62	56
Flat Bed Truck	88	68	62	56
Dump Truck	88	68	62	56
Flat Bed Trailer	88	68	62	56
Tractor	80	60	54	48
Concrete Truck	86	66	60	54
Concrete Pump	82	62	56	50
Front End Loader	83	63	57	51
Road Scraper	87	67	61	55
Air Compressor	82	62	56	50
Average Construction Site	85	65	59	53
Source: La Plata County (2002)				

Paleontology

Affected Environment

There a two surface formations present within the study area. The GR 32-32 well pad is underlain by both Lower Green River and Wasatch Formation sediments. Surface exposures present on the GM 214-33 well pad is strictly Wasatch Formation (including the Ft. Union equivalent at its base) and Ohio Creek Formation. As mapped by the COGCC, the dividing line between surface exposures of the two

formations is right through the center of the GR 32-32 well pad separating it into Green River sediments to the south, and Wasatch Formation sediments to the north.

The Wasatch Formation is a BLM Class 5 formation, defined as a highly fossiliferous geologic unit that consistently and predictably produces vertebrate fossils or scientifically significant invertebrate or plant fossils, and that are at risk of human-caused adverse impacts or natural degradation. The Wasatch Formation is divided into the early Eocene Shire, and the Paleocene age Molina and Atwell Gulch Members. All members of the Wasatch Formation contain vertebrate fossils in varying abundances (Murphy and Daitch 2007). Rocks of the Wasatch Formation are lithologically very similar to one another throughout the Piceance Creek Basin as heterogeneous continental fluvial deposits with interfingering channel sandstone beds and overbank deposits consisting of variegated claystone, mudstone, and siltstone beds (Franczyk et al. 1990).

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

Environmental Consequences

Proposed Action

Construction activities have the potential to adversely affect scientifically important fossils. The greatest potential for impacts is associated with excavation of surficial materials and shallow bedrock. In general, alluvium and colluvium are much less likely to contain well preserved plant and animal remains than intact native sediments.

No identified fossil localities are located within a 1 -mile radius of the GR 32-32 well pad, nor the entire Section 32. An examination of the BLM paleontology database indicates three fossil localities are found within a 1-mile radius of the GM 214-33 well pad. Located approximately 4,000’ to the northeast in Section 28, the three sites are located within 1,000’ of one another, with two of the sites separated by only 500’. There are also sites identified within Section 27, but those three sites are well over 1½ miles distant. No other fossil resources have been discovered within any other adjacent sections with the exception of Section 4, but those sites too are well over a mile away, southeast of the proposed activities. The potential for fossil discovery is unlikely since both well pads are existing and surrounding surface areas have been previously disturbed. Surface inspection during on-site visits did not yield any evidence to require further investigation. In the event that paleontological resources are encountered, a standard paleontological COA would be attached to the APDs (Appendix A, Number 13).

No Action Alternative

Under the no action alternative, drilling and production activities would still occur for the fee wells. Ground-disturbing activities would be reduced, but not eliminated. The potential to impact paleontological resources is unlikely. In the event that paleontological resources are encountered, a standard paleontological COA would be attached to the APDs (Appendix A, Number 13).

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.

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

Federal mineral royalties are levied on oil and gas production from Federal mineral leases. For oil and gas production in Garfield County in 2003, total Federal royalties collected amounted to $125,683,586. Half of those royalties of $62,841,784 was paid to the State of Colorado. The State's share of the revenue was then distributed to a variety of state and local agencies. Counties where oil and gas were produced received 8 percent of total revenues, local towns in those counties received 5 percent, and local school districts received 5 percent. In 2003, the Garfield County share of Federal mineral lease royalties was $1,332,000.

Environmental Consequences

Proposed Action

The proposed action would result in a minor positive impact on the economy of Garfield County through increases in tax and royalty revenues. Additional job opportunities might also be created and supporting trades and services would benefit to a minor extent.

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

No Action Alternative

Under this alternative, minor positive economic impacts and nominal negative social impacts associated with the proposed action would not occur.

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 three separate soil complexes. Pads 14-28, 22-32, 31-32, and 204-29 are all located on Nihill

channery loam, 6 to 25 percent slopes. This soil complex is found on alluvial fans and sides of valleys at elevations ranging from 5,000 to 6,500 feet, and is used mainly for limited grazing and wildlife habitat. The parent material for this soil complex consists of sandstone and shale. Although this soil is well-drained, it has slow surface runoff and the erosion hazard is classified as severe.

Pads 32-32 and 41-32 are located on Torriorthents-Camborthids-Rock outcrop complex, steep slopes. This broadly-defined soil complex is found on foothills and mountainsides at a wide range of elevations; it is used for grazing, wildlife habitat, and recreation. The parent material for this soil complex consists of sandstone and shale, with occasional concentrations of basalt and limestone. This clayey to loamy soil has moderate to severe erosion hazard.

Pad 214-33 is located on Villa Grove-Zoltay loams, 15 to 30 percent slopes. This soil complex is found on alluvial fans and mountainsides at elevations from 7,500 to 7,600 feet; it is used mainly for grazing and wildlife habitat, with irrigated pasture in more level areas. The parent material for this soil complex is primarily basalt, with minor amounts of sandstone and shale. This loam to clay loam is well-drained, surface runoff is slow, and erosion hazard is slight. On the other hand, Garfield County has identified the area including the GM 214-33 pad as an area of major slope hazard.

Environmental Consequences

Proposed Action

The area is fairly arid; on north-facing slopes it generally contains adequate vegetation buffers that would minimize the potential for sediment transport. However, on south-facing slopes vegetation is sparse and may often be inadequate to provide a buffer for sediment transport. The impact of construction activities on soil loss is thus a function of slope direction as well as slope angle and soil type. Overall, construction activities have the potential to cause a slight to moderate increase in soil loss, loss of soil productivity, and sediment available for transport to surface waters downstream in Parachute Creek and the Colorado River.

Six of the seven pads involved in the proposed action are situated on soils with severe erosion hazard, the exception being the GM 214-33 pad. The GM 204-29 pad is partially situated on a slope steeper than 30% as well as a soil with severe erosion hazard. None of the proposed surface disturbance would occur on Federal land, and the GM 204-29 pad is not proposed to be used for drilling into Federal minerals, so fragile soil stipulations are not triggered for this project. However, since some slopes on the expanded pads will be steepened beyond a 30% slope prior to interim reclamation, particular care should be taken to ensure that proper BMPs are utilized to prevent erosion and slope instability due to construction activities.

No Action Alternative

If COGCC issued APDs for the three fee wells planned on the two drilling pads, the resulting drilling and completion activity would still require pad expansion, construction of the largest cuttings pit, and possible pipeline installation; thus, this alternative would have approximately 25% to 30% lower potential for impacts to slope stability and soil loss than would the proposed action since the smaller cuttings pits would not be constructed.

Analysis of the Public Land Health Standard for Upland Soils

The proposed action and the no action alternative would not likely prevent Standard 1 from being achieved, assuming all appropriate BMPs are put in place, as discussed above.

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

Affected Environment

The existing pads are located within open juniper woodland interspersed with shadscale (*Atriplex confertifolia*), four-wing saltbush (*Atriplex canescens*), and rubber rabbitbrush (*Chrysothamnus nauseosus*). Portions of the pads were previously reclaimed and seeded with native species like wheatgrasses and four-wing saltbush, and non-native species such as Russian wildrye (*Psathyrostachys juncea*), smooth brome (*Bromus inermis*), and alfalfa (*Medicago sativa*).

Environmental Consequences

Proposed Action

Total short-term surface disturbance for the proposed development would be approximately 7.5 acres of private land. With implementation of reclamation practices identified in Appendix A, establishment of desirable herbaceous vegetation on the unused portions of the pad, pipeline, and road could be restored within 2 to 3 years. The establishment of mature shrubs could take from 5 to 25 years, and the establishment of trees would take even longer. Interim reclamation would result in about a 75-percent reduction in surface disturbance of the pad that would remain over the long-term life of the project. Assuming the pads are reclaimed to the extent possible, total long-term surface disturbance associated with the proposed action would be approximately 6 acres of private land.

No Action Alternative

Under the no action alternative, drilling of the fee wells and development of several cuttings pits would still occur. This would involve an approximate 28% decrease in construction activity and 57% decrease in drilling, completion, and production activity and traffic. The resulting impacts to vegetation would be reduced compared to those generated by the proposed action, but not eliminated.

Analysis on the Public Land Health Standard for Plant and Animal Communities (partial, see also **Wildlife, Aquatic and Wildlife, Terrestrial**): The Rifle West LHA determined that this portion of the landscape was not meeting Standard 3 (BLM 2005). Problems noted were the widespread invasion of cheatgrass with a corresponding loss of other functional groups such as perennial native grasses and forbs. Also, sagebrush communities were dominated by old, decadent sagebrush with poor recruitment. The surface disturbance associated with the proposed action has the potential to encourage expansion and dominance of the site by cheatgrass and other weeds. Provisions to revegetate the disturbed areas with native vegetation and to control noxious weeds are presented in Appendix A. If the area is successfully revegetated and weeds are controlled, the proposed action would not have a negative impact on existing vegetative communities. The density, frequency and composition of native plant species could be maintained at present levels.

The no action alternative would result in a failure of the area to achieve Standard 4 because drilling of the fee wells and development of several cuttings pits would still occur.

Visual Resources

Affected Environment

The proposed well pads and cuttings pits locations are located in an area that received a *Visual Resource Management (VRM) Class IV* designation in the1984 Glenwood Springs Resource Management Plan.

The objective for this class is to provide for management activities that require major modifications of the existing character of the landscape. The level of change to the characteristic landscape may be high. These management activities may dominate the view and be the major focus of view attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements.

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

The extent of VRM classes, landscape character, and scenic quality on public and private lands in the high natural gas production area of Garfield County are discussed on pages 3-41 through 3-45 of the 1999 – Oil and Gas Leasing & Development Final Supplemental Environmental Impact Statement (FSEIS). The impacts of development are discussed on pages 4-49 through 4-54 of the FSEIS. The Proposed Action would not affect any of the key viewing areas or viewsheds described therein. In particular, the Proposed Action would not be seen from the key viewing areas along the 1-70 corridor.

Environmental Consequences

Proposed Action

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

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

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

No Action Alternative

Under the no action alternative, development would occur on private mineral estate and the BLM, therefore, would have no authority to manage visual resources and suggest possible mitigation. The private surface owner would still have discretion over the protection of the visual characteristics of the landscape.

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

Affected Environment

Starkey Gulch supports a perennial stream, mainly fed by numerous springs and seeps that occur in the upper portions of the project area. However, due to the porous nature of the streambed material, water disappears underground in some areas. As a result, the stream is not fish-bearing. Parachute Creek contains an abundance of aquatic wildlife and is located approximately 0.5 mile from the east side of the project area. No other aquatic systems are in the vicinity of the proposed project area.

Proposed Action

Environmental Consequences

Proposed Action

Although little habitat loss would occur as a result of the proposed action, each pad would be redisturbed to allow for additional drilling and/or cuttings pits. Thus, soils would be exposed to increased erosion potential and nearby drainages to sedimentation. Erosion and sedimentation has the potential to impact trout species by silting in important spawning substrates and limited pool habitat, and by covering gravels and cobbles needed by aquatic insect larvae important as a food supply for the introduced trouts and some native fishes. Sediment can reduce water quality and limit fish productivity. To minimize impacts to downstream fishes and aquatic insects, the mitigation measures presented in Appendix A are included as Conditions of Approval.

No Action Alternative

Environmental Consequences

Under the no action alternative, drilling and production activities would still occur for the fee wells and one cuttings pit would be redeveloped. Therefore, potential impacts to aquatic wildlife would be reduced but not eliminated.

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

Although the proposed action has the potential to increase sediment, the anticipated increase would not increase sediment loads above normal levels. Therefore, the proposed action should have minimal impact on aquatic wildlife and is not expected to affect Standard 3 land health indicators.

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

Affected Environment

The project area supports a diverse community of trees, shrubs, forbs, and grass species. The pinyon-juniper understory is vegetated with species such as galleta grass, Indian ricegrass and bottlebrush squirreltail. A number of the side drainages and Starkey Gulch are densely vegetated with riparian species including narrowleaf cottonwood, box-elders, mountain maple and willow. These vegetation types provide cover, forage, and nesting habitat for a variety of big game and small game, as well as non-game mammals, birds, and reptiles. The proposed action is located within winter range, winter concentration areas, and severe winter range for mule deer and is within 0.5 mile of elk winter range.

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

Additional, indirect habitat loss may occur if increased human activity (e.g., traffic, noise) associated with infrastructure cause mule deer and elk to be displaced or alter their habitat use patterns. Indirect habitat loss generally includes habitat within an eighth of a mile of a road or well pad (e.g., BLM 1999b). Although federal lease COC 24099 contains no specific stipulations, the BLM can enforce Conditions of Approval (COAs) on individual APDs to protect important resource values such as mule deer winter range. However, a winter timing limitation COA is not included due to the development of private minerals concurrent with federal mineral development. Therefore, impacts described above could be expected for deer and elk during the critical wintering season.

No Action Alternative

Under the no action alternative, drilling and production activities would still occur for the fee wells and one cuttings pit would be redeveloped. Therefore, potential impacts to terrestrial wildlife would be reduced but not eliminated.

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

The Rifle West land health assessment found that 38,373 acres of land within this watershed are not meeting Standard 3 for some wildlife species, most notably mule deer (BLM 2005). Of this acreage, 12,549 acres are located on BLM land. The primary problem is large-scale habitat fragmentation due to natural gas exploration and development that has resulted in increased road, well pad, and pipeline densities. This physical loss of habitat is exacerbated when combined with increasing human use.

Other factors contributing to the failure to achieve Standard 3 for wildlife include: the encroachment of juniper into sagebrush habitats, a lack of forb production, poor condition of sagebrush, and poor understory conditions. Some individual sagebrush stands are hedged and some stands are decadent with poor age class diversity and limited regeneration or recruitment.

The proposed action would result in direct and indirect losses of habitat and result in increased human use in the area. Given the level of activity in the greater area, the proposed action may further trend the watershed away from meeting Standard 3 for some terrestrial wildlife species.

SUMMARY OF CUMULATIVE IMPACTS

The *Glenwood Springs Oil and Gas Leasing and Development Final Supplemental EIS* (FSEIS) (BLM 1999) analyzed three alternatives for oil and gas development in the Glenwood Springs Resource Area.

The assessment included an analysis of impacts of past, present, and reasonable foreseeable future actions, including predicted future oil and gas development, on both public and private lands. Since the FSEIS presents the most current analysis of cumulative impacts in the project area, it is incorporated by reference.

Until relatively recently, modifications of the region have been characteristic of agricultural and ranching lands, with localized industrial impacts associated with the railroad and I-70 highway corridors. More recently, these changes are cumulative to the growth of residential and commercial uses, utility corridors, oil and gas developments, and other rural industrial uses. These increasing activity levels have accelerated the accumulation of impacts in the area. These impacts have included: (1) direct habitat losses; (2) habitat fragmentation and losses in habitat effectiveness; (3) elevated potential for runoff, erosion, and sedimentation; (4) expansion of noxious weeds and other invasive species; and (5) increased noise and traffic and reductions in the scenic quality of the area (BLM 1999: 4-1 to 4-68).

None of the cumulative impacts described in the FSEIS were characterized as significant, and new technologies and regulatory requirements have reduced the impacts of some land uses. Nonetheless, it is clear that past, present, and reasonably foreseeable future actions have had and would continue to have adverse affects on various elements of the human environment. The anticipated impact levels for existing and future actions range from negligible to locally major, and primarily negative, for specific resources. The primary reasons for this assessment are twofold: (1) the rate of development, particularly oil and gas development, is increasing in the area, resulting in an accelerated accumulation of individually nominal effects; and (2) the majority of residential and commercial expansion, as well as oil and gas development, have occurred, and are likely to continue to occur, on private holdings where mitigation measures designed to protect and conserve resources are not in effect.

It is clear that the proposed action would contribute to the collective adverse impact for some resources. Although the contribution would be very minor, the proposed action would contribute incrementally to the collective impact to air and water quality, vegetation, migratory birds, terrestrial wildlife, and other resources.

PERSONS AND AGENCIES CONSULTED

Williams Production Company RMT

INTERDISCIPLINARY REVIEW

Name	***Title***	***Responsibility***
Vanessa Bull	Natural Resource Specialist	Team Leader, Access and Transportation, Visual Resources, Solid and Hazardous Wastes, Socio-Economics
Beth Brenneman	Ecologist	Plants, Special Status Species (Plants), Invasive Non-native Species
Jeff Cook	Wildlife Biologist	Special Status Species (Wildlife and Fish), Migratory Birds, Aquatic and Terrestrial Wildlife
Karen Conrath	Geologist	Groundwater, Paleontology, Geology and Minerals
John Brogan	Archaeologist	Cultural Resources and Native American Concerns
Noel Ludwig	Hydrologist	Soil, Air, Surface Water, US Waters, Noise, Prime Farmland, Wetlands
Dane Geyer	Petroleum Engineer	Downhole COAs

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FONSI
CO140-2008-038 EA

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

DECISION RECORD

DECISION: It is my decision to approve.... This decision will provide for the orderly, economical, and environmentally sound exploration and development of oil and gas resources on valid oil and gas leases.

RATIONALE: The bases for this decision are as follows:

1. Approval of the proposed action is validating the rights granted with the Federal oil and gas leases to develop the leasehold to provide commercial commodities of oil and gas.

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

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

NAME OF PREPARER: Text

SIGNATURE OF AUTHORIZED OFFICIAL:

Supervisory Natural Resource Specialist

DATE SIGNED: Oct. 20, 2008

APPENDIX A

SURFACE USE CONDITIONS OF APPROVAL

STANDARD SURFACE USE CONDITIONS OF APPROVAL

STANDARD COAS APPLICABLE TO ALL ACTIVITIES WITHIN THE CO140-2008-130 ENVIRONMENTAL ASSESSMENT (REFER TO WELL FILE GM 312-33)

The following standard surface use COAs are in addition to all stipulations attached to the respective Federal leases and to any site-specific COAs for individual well pads.

1. Administrative Notification. The operator shall notify the BLM representative at least 48 hours prior to initiation of construction.

2. Road Construction and Maintenance. Roads shall be crowned, ditched, surfaced, drained with culverts and/or water dips, and constructed to BLM Gold Book standards. Initial gravel application shall be a minimum of 4 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 authorized officer.

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 authorized officer 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 in flowing streams shall utilize either a piped stream diversion or a coffer dam 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 18 inches. Contact Noel Ludwig, Glenwood Springs Energy Office Hydrologist, at 970-947-5215 or Noel_Ludwig@blm.gov. Crossings of drainages deemed to be jurisdictional waters of the U.S. pursuant to Section 404 of the Clean Water Act may require additional culvert design capacity. Due to the flashy nature of area drainages and anticipated culvert maintenance, the U.S. Army Corps of Engineers recommends designing drainage crossings for the 100-year event. Contact Sue Nall at 970-243-1199 x16 or susan.nall@usace.army.mil.

   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 preconstruction conditions.

5. Jurisdictional Waters of the U.S. The operator shall obtain appropriate permits from the U.S. Army Corps of Engineers prior to discharging fill material into waters of the U.S. in accordance with Section 404 of the Clean Water Act. Waters of the U.S. are defined in 33 CFR Section 328.3 and may include wetlands as well as perennial, intermittent, and ephemeral streams. Permanent impacts to waters of the U.S. may require mitigation. Contact Sue Nall, Regulatory Specialist,

Colorado/Gunnison Basin Regulatory Office, U.S. Army Corps of Engineers, at 970-243-1199 x16 or susan.nall@usace.army.mil.

6. Wetlands and Riparian Zones. The operator shall restore temporarily disturbed wetlands or riparian areas. The operator shall consult with the BLM Glenwood Springs Energy Office to determine appropriate mitigation, including verification of native plant species to be used in restoration. Contact Noel Ludwig, Glenwood Springs Energy Office Hydrologist, at 970-947-5215 or Noel_Ludwig@blm.gov.

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. Deadline for Temporary Seeding and Interim Reclamation. Topsoil storage piles, stormwater control features, and cut-and-fill slopes shall undergo temporary seeding to stabilize the material and minimize weed infestations within 30 days following completion of pad construction. Interim reclamation to reduce a well pad to the maximum size needed for production shall be completed within 6 months following completion of the last well planned for the pad.

      Both of these deadlines are subject to being extended upon approval of the authorized officer based on season, timing limitations, or other constraints on a case-by-case basis.

   b. Topsoil Stripping, Storage, and Replacement. Topsoil shall be stripped following removal of vegetation during construction of well pads, pipelines, roads, or other surface facilities. This shall include, at a minimum, the upper 6 inches of soil. Any additional topsoil present at a site, such as indicated by color or texture, shall also be stripped. The authorized officer may specify a stripping depth during the onsite visit. The stripped topsoil shall be stored separately from subsoil or other excavated material and replaced prior to final seedbed preparation.

   c. 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.

   d. 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

allows use of a seed mix containing sterile hybrid non-native species in addition to native perennial 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 supplied to the BLM Glenwood Springs Energy Office Ecologist (Beth Brenneman, 970-947-5232 or beth_brenneman@blm.gov) at least 14 days before the date of proposed seeding for acceptance. Seed that does not meet the above criteria shall not be applied to public lands.

e. 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. Hydroseeding and hydromulching may be used in temporary seeding or in areas where drill-seeding or broadcast-seeding/raking are impracticable. Hydroseeding and hydromulching must be conducted in two separate applications to ensure adequate contact of seeds with the soil.

If interim revegetation is unsuccessful, the operator shall implement subsequent reseedings until interim reclamation standards are met. Requirements for reseeding of unsuccessful temporary seeding will be considered on a case-by-case basis.

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

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

g. Erosion Control. Cut-and-fill slopes shall be protected against erosion with the use of water bars, lateral furrows, or other measures approved by the authorized officer. Biodegradable straw matting, bales, or wattles of weed-free straw or weed-free native grass hay, or well-anchored fabric silt fence shall be used on cut-and-fill slopes and along drainages to protect against soil erosion. Additional BMPs shall be employed as necessary to reduce erosion and offsite transport of sediment.

h. 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 authorized officer will approve the type of fencing.

i. Monitoring. The operator shall conduct annual monitoring surveys of reclaimed areas and shall submit an annual monitoring report to the authorized officer by **December 31** of each year. The

monitoring program shall use the four Reclamation Categories defined in Appendix I of the 1998 DSEIS to assess progress toward reclamation objectives. The annual report shall document whether attainment of reclamation objectives appears likely. If one or more objectives appear unlikely to be achieved, the report shall identify appropriate corrective actions. Upon review and approval of the report by the BLM, the operator shall be responsible for implementing the corrective actions or other measures specified by the authorized officer.

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 Energy Office *Noxious and Invasive Weed Management Plan for Oil and Gas Operators*, dated March 2007. A Pesticide Use Proposal (PUP) must be approved by the BLM prior to the use of herbicides. Annual weed monitoring reports shall be submitted by **December 31**. Contact Beth Brenneman, Glenwood Springs Energy Office Ecologist, at 970-947-5232 or beth_brenneman@blm.gov.

9. Big Game Winter Range. To reduce impacts to wintering big game, remote sensing should be used for production monitoring, and unavoidable monitoring or maintenance activities should be conducted between 9 a.m. and 3 p.m., to the extent practicable. These recommendations apply to the period from December 1 to April 30. Contact Jeff Cook, Glenwood Springs Energy Office Wildlife Biologist, at 970-947-5231 or jeffrey_cook@blm.gov.

10. Raptor Nesting. Raptor nest surveys conducted in 2007 and 2008 did not result in location of raptor nest structures within 0.25 mile of a well pad or 0.125 mile of an access road, pipeline, or other surface facility. Therefore, a Raptor Nesting Timing Limitation COA is not attached to this APD. Although BLM considers surveys conducted for a NEPA Environmental Assessment to be valid for 5 years, new nests may be built and occupied between the initial surveys and project implementation. To ensure compliance with the Migratory Bird Treaty Act, the operator should schedule construction or drilling activities to begin outside the raptor nesting season (February 1 to August 15) if practicable. If initiation of construction or drilling during these dates cannot be avoided, the operator is responsible for complying with the Migratory Bird Treaty Act, which prohibits the "take" of birds or active nests (those containing eggs or young), including nest failure caused by noise and human activity. Contact Jeff Cook, Glenwood Springs Energy Office Wildlife Biologist, at 970-947-5231 or jeffrey_cook@blm.gov).

11. 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. Several established methods to prevent bird access are known to be effective, such as netting or bird-balls. However, the USFWS has determined that the use of flagging is ineffective in deterring birds from using ponds or pits and provides no assurance of compliance with the MBTA. Regardless of the method used, it should be employed as soon as practicable after the pit has begun receiving liquids. At a minimum, the method 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 U.S. Fish and Wildlife Service. For further assistance, contact Creed Clayton, USFWS

Biologist assigned to the Glenwood Springs Energy Office, at 970-947-5219 or creed_clayton@fws.gov, and visit http://www.fws.gov/mountain-prairie/contaminants/oilpits.htm.

12. Birds of Conservation Concern: Pursuant to BLM Instruction Memorandum 2008-050, all surface-disturbing activities are prohibited from May 1 to June 30 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. Contact Jeff Cook, Glenwood Springs Energy Office Wildlife Biologist, at 970-947-5231 or jeffrey_cook@blm.gov).

13. 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.

14. *Ips* Beetle. To avoid mortality of pinyon pines due to infestations of the *Ips* beetle, any pinyon trees damaged during road, pad, or pipeline construction shall be chipped after being severed from the stump or grubbed from the ground, buried in the toe of fill slopes (if feasible), or cut and removed from the site within 24 hours to a location approved by the Colorado State Forest Service.

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 authorized officer of the findings. The discovery must be protected until notified to proceed by the BLM authorized officer.

    Where feasible, the operator shall suspend ground-disturbing activities at the discovery site and immediately notify the BLM authorized officer of any finds. The BLM authorized officer will, as soon as feasible, have a BLM-permitted paleontologist 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 authorized officer shall be notified by telephone, with written confirmation, immediately upon the discovery of human remains, funerary items, sacred objects, or objects of cultural patrimony. Further, pursuant to 43 CFR 10.4 (c) and (d), activities shall stop in the vicinity of the discovery, and the discovery shall be protected for 30 days or until notified by the BLM authorized officer 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 authorized officer 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 authorized officer. Approval to proceed will be based upon evaluation of the resource. Evaluation shall be by a qualified professional selected by the BLM authorized officer 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 authorized officer 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 authorized officer 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 authorized officer 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 authorized officer will provide technical and procedural guidelines for relocation and/or to conduct mitigation. Upon verification from the BLM authorized officer 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).

Native American Religious Concerns. The Native American Graves Protection and Repatriation Act (NAGPRA), requires that if inadvertent discovery of Native American Remains or Objects occurs, activity must cease in the area of discovery, a reasonable effort made to protect the item(s) discovered, and immediate notice made to the BLM 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)).

18. Visual Resources. Production facilities shall be placed to avoid or minimize visibility from travel corridors, residential areas, and other sensitive observation points—unless directed otherwise by the authorized officer due to other resource concerns—and shall be placed to maximize reshaping of cut-and-fill slopes and interim reclamation of the pad.

To the extent practicable, existing vegetation shall be preserved when clearing and grading for pads, roads, and pipelines. The authorized officer 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.

SITE SPECIFIC CONDITIONS OF APPROVAL

GM 214-33

Flare Pit: The flare pit proposed on the original plat was determined to be too close to the road. The new location of the flare pit is to be along the east side of the pad. Changes to the location must be approved by the authorized officer.

Reserve Pit: The use of the reserve pit for cuttings has been eliminated. Cuttings will be disposed of at an offsite cuttings trench. Any changes related to cuttings disposal must be approved by the authorized officer.

GR 32-32

Limits of Disturbance: The plats for the GR 32-32 show disturbance to be occurring beyond the original disturbance. During the onsite for the GR 32-32, it was determined that the pad could be arranged to stay within the limits of original disturbance. Any construction outside the original disturbance boundary must first have approval from the authorized officer.

The existing stormwater diversion ditch along the eastern edge of the GR 32-32 pad shall be lined with rock to prevent further gullying.

Cuttings Pits

All cuttings pits locations are to remain in previously disturbed areas. The cuttings pit on the GM 22-32 location will be moved slightly east/northeast in such a fashion as to avoid any incursion on the existing drainage and wetland area that runs along the south edge of the pad.

The GM 204-29 pad is experiencing excessive erosion along its southern edge. This area needs to be reseeded and have additional BMPs put in place.

Spoil material removed from the cuttings pit on the MV 41-21 pad will be relocated relative to the stockpile area depicted on the engineering plat; it is to be shifted approximately 40 feet to the southwest to avoid destruction of the pinyon pines along the northeast edge of the pad.

APPENDIX B

DOWNHOLE CONDITIONS OF APPROVAL

DOWNHOLE CONDITIONS OF APPROVAL
Applications for Permit to Drill

Company/Operator: Williams Production RMT Company

Surface Location: SWNE, Section 32, Township 6 South, Range 96 West, 6th P.M.

Well Name	Well No.	Bottomhole Location	Lease
GM	42-32	SENE Sec. 32, T. 6S, R. 96W.	COC 24099
GM	342-32	SENE Sec. 32, T. 6S, R. 96W.	COC 24099

Surface Location: NWNW, Section 33, Township 6 South, Range 96 West, 6th P.M.

Well Name	Well No.	Bottomhole Location	Lease
GM	312-33	SWNW Sec. 33, T. 6S, R. 96W.	COC 24099
GM	412-33	SWNW Sec. 33, T. 6S, R. 96W.	COC 24099

1. The downhole COAs identified in the Williams Production RMT Company Master APD (Approved April 27, 2006) for the Grand Valley Prospect Area A shall apply.
2. In accordance with 43 CFR 3162.4(b), the operator shall submit a complete set of electrical/mechanical logs in .LAS format with standard Form 3160-4, Well Completion or Recompletion Report and LOG. Please contact Karen Conrath at 970-947-5235 or karen_conrath@blm.gov for clarification.
3. Twenty-four hours *prior* to (a) spudding, (b) conducting BOPE tests, (c) running casing strings, and (d) within twenty-four hours *after* spudding, the GSEO shall be notified. One of the following GSEO's inspectors shall be notified by phone: Steve Ficklin at 970-947-5212, Julie King shall at 970-947-5239, and Todd Sieber at 970-947-5220.
4. A GSEO 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, changes or variances to the BOPE, deviating from conditions of approval, and conducting other operations not specified within the APD. Please contact Dane Geyer at 970-947-5229 (office) or 970-589-6887 (cell) for verbal approvals. As a secondary contact, Bob Hartman may be contacted at 970-244-3041 (office) or 970-250-7002 (cell).
5. If a well control issue arises (e.g. kick, blowout, or water flow) Dane Geyer shall be notified within 24 hours from the time of the event.
6. A gas buster shall be functional and all flare lines effectively anchored in place, prior to drilling out the next shoe. The discharge of the flare lines shall be a minimum of 100' 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. Where noncombustible gas is likely or expected to be vented, the system shall be provided supplemental fuel for ignition and maintain a continuous flare.
7. 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) Formation Integrity Test results with the well completion report. Please contact Dane Geyer for clarification.

EPA'S LIST OF NONEXEMPT EXPLORATION AND PRODUCTION WASTES

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

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