

**United States Department of the Interior
Bureau of Land Management**

**Environmental Assessment
for the
Cow Ridge P08 798 Well Pad
COC-65131**

Grand Junction Field Office
2815 H Road
Grand Junction, Colorado 81506

DOI-BLM-CO-130-2011-0056-EA



February 2012

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CHAPTER 1 - INTRODUCTION

1.1 IDENTIFYING INFORMATION

BACKGROUND: This Environmental Assessment (EA) has been prepared by the Bureau of Land Management (BLM) to analyze the construction of a proposed natural gas well pad, access road, and associated facilities in order to drill two natural gas wells. Encana Oil & Gas (USA), Inc. (Encana) submitted two Applications for Permit to Drill (APD) for the wells, a single well pad and an access road on August 26, 2011. The APD was considered complete on November 21, 2011. The proposed well pad and access road are entirely on Federal surface. Figure 1 shows the general project location, specific location of the well pad, and the location of the potential future pipeline. Currently, there is no pipeline to move gas from these wells to a gathering system. If the wells are productive, Encana would add additional production facilities and eventually an 8-inch surface pipeline (Figure 1), approximately eight miles in length, to connect to well pad KM B07 799 and, ultimately, to the existing temporary Kimball Mountain pipeline (COC-74679).

CASEFILE/PROJECT NUMBER: Lease COC-65131

PROJECT NAME: Cow Ridge P08 798 Well Pad and Associated Wells (CR04D-9 P08 798 and DH7A-4 P08 798)

PLANNING UNIT: Grand Junction Field Office (GJFO)

1.2 PROJECT LOCATION AND LEGAL DESCRIPTION

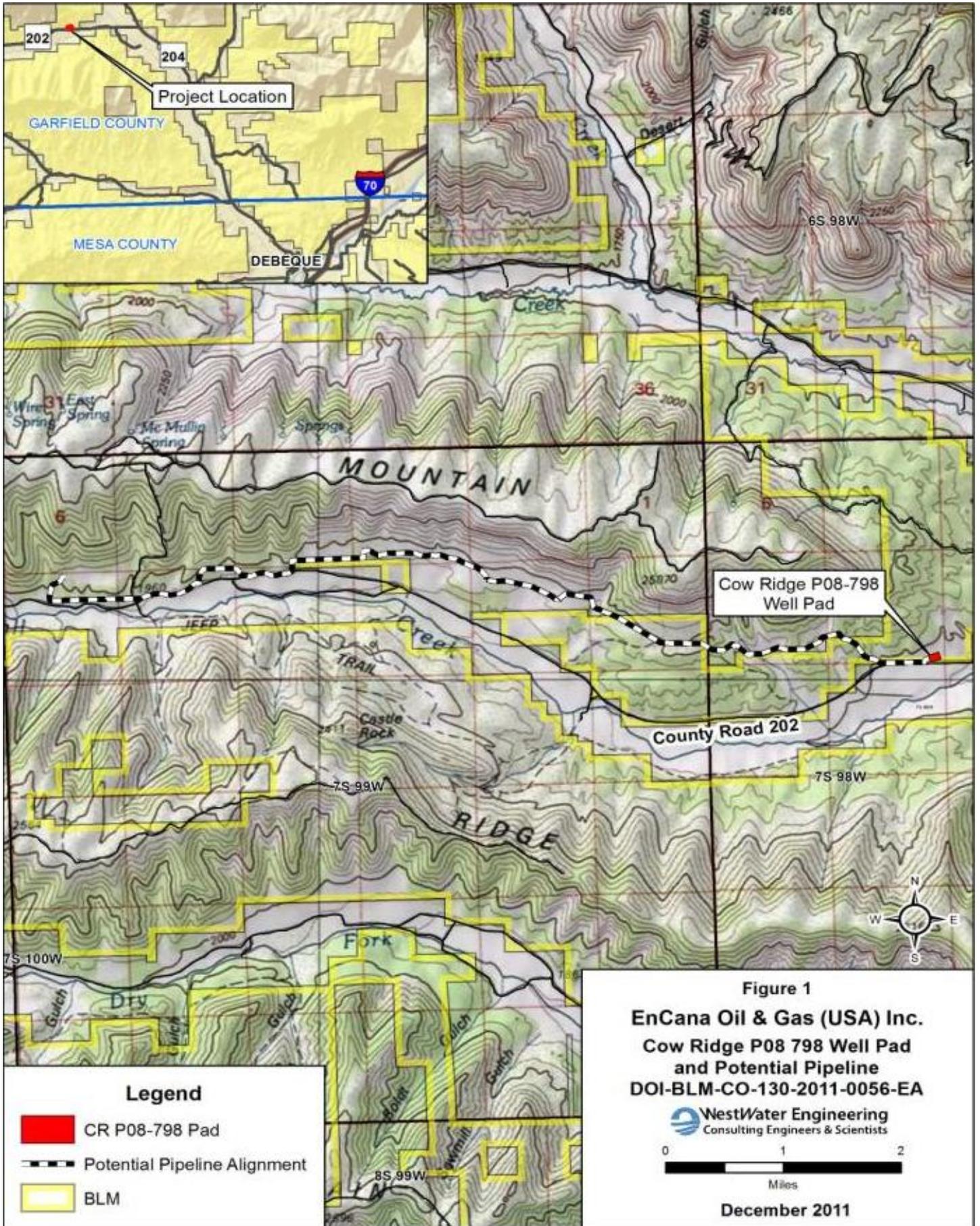
LEGAL DESCRIPTION:

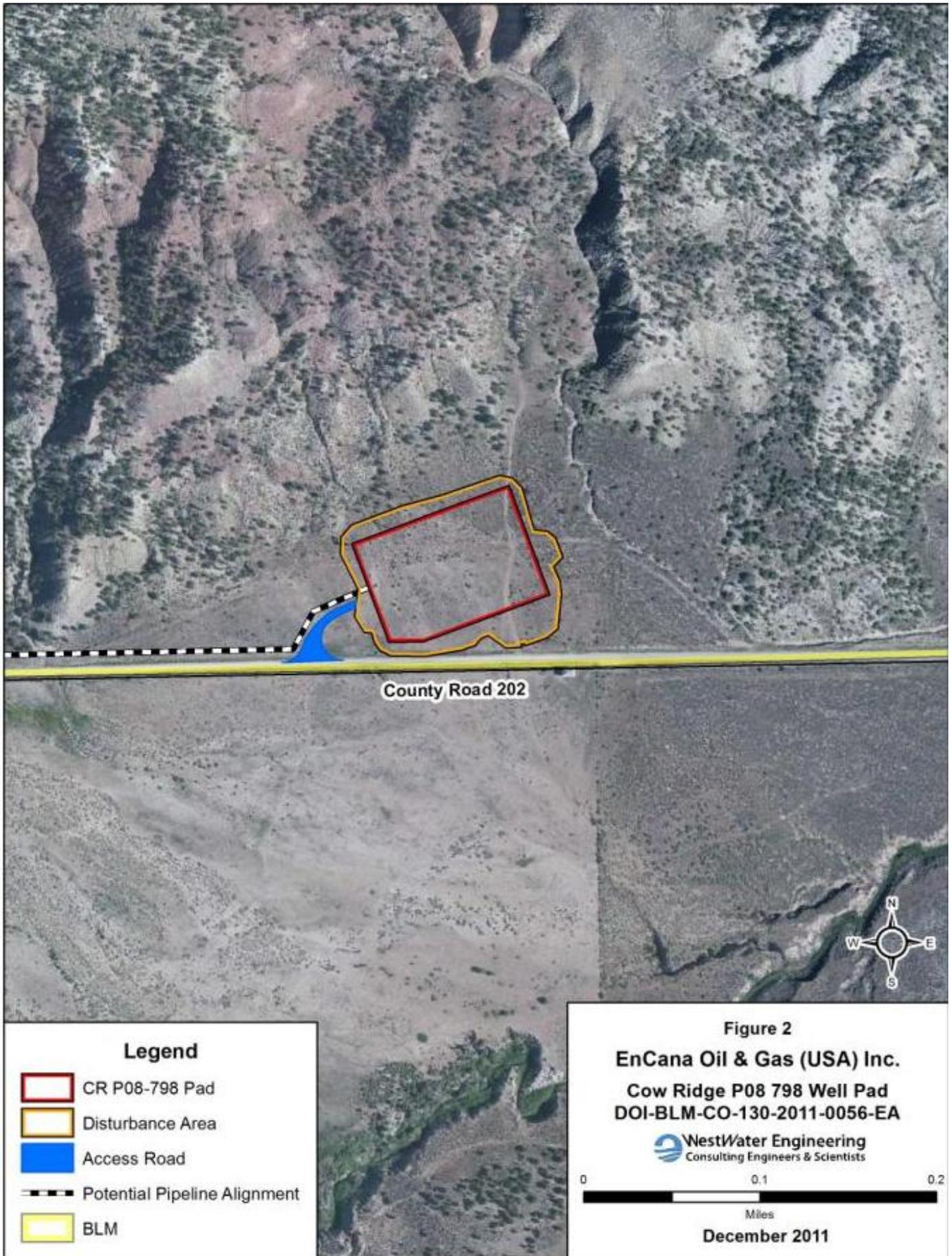
Well Pad: Section 8, Township 7 South, Range 98 West, 6th P.M.

Future Pipeline: Sections 7 & 8, Township 7 South, Range 98 West; and Sections 7, 8, 9, 10, 11, & 12, Township 7 South, Range 99 West, 6th P.M.

The proposal well pad and wells are located northwest of the town of DeBeque, Colorado, in Garfield County. Figure 1 is a map of the proposal and project area. The project area can be reached by proceeding in a northerly, then northwesterly direction on County Road 204 from DeBeque, Colorado, approximately 11.2 miles to the junction of County Road 204 and County Road 202 to the west. Turn left and proceed in a westerly direction approximately 2.4 miles to the proposed P08 798 well pad, and short access road. Figure 2 shows the proposed well pad and access road.

Although not part of this application, Encana is reviewing a potential pipeline from this pad that would terminate approximately 8 miles to the west at the existing Encana KM B07 799 well. Ultimately, this pipeline would connect to the Kimball Mountain temporary pipeline (COC-74679). The approximate location of this potential pipeline is shown in Figure 1.





1.3 PURPOSE AND NEED

The purpose of the action is to provide a permit to EnCana for drilling two natural gas wells to access mineral lease rights held by the company. The need is for BLM to respond to EnCana's application per BLM's responsibility under the Mineral Leasing Act (MLA), the Mining and Minerals Policy Act of 1970, the Federal Land Policy and Management Act of 1976, the National Materials and Minerals Policy, Research and Development Act of 1980, and the Federal Onshore Oil and Gas Leasing Reform Act of 1987 .

Should the Proposed Action be approved, it would include mitigation measures identified during the analysis to alleviate resource impacts in accordance with the objectives and decisions of the Grand Junction Resource Area Resource Management Plan (RMP) (BLM 1987), as well as other applicable policies, regulations, and laws that define BLM's multiple use mandate.

1.4 PLAN CONFORMANCE REVIEW

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: GRAND JUNCTION Resource Management Plan

Date Approved: JANUARY, 1987

Decision Number/Page: Page 2-7, and Page 2-29

Decision Language: Page 2-7: "To make Federal oil and gas resources available for leasing, except where prohibited by law or where administrative action is justified in the national interest and to make public lands available for economically and environmentally sound exploration and development projects. To avoid health and safety hazards, to protect sensitive resource values from unacceptable impacts and to minimize impacts to lessees from sensitive resource protection and hazard avoidance."

Page 2-29: "To respond in a timely manner, to requests for utility authorizations on public land while considering environmental, social, economic, and interagency concerns." "Designate 606,456 acres (Map 18) as sensitive to public utility development (Table 20). Design utility routes and projects in these zones so as to protect resources of concern from undue damage." "Encourage use of existing corridors or upgrading of existing facilities in sensitive and suitable zones."

The future pipeline falls within an area that is considered sensitive in the 1987 Resource Management Plan. Therefore, future pipeline design should take advantage of existing pipeline right-of-ways (ROWs), such as COC-59056 a 6-inch gas pipeline (BLM 2011b), located in the area of the future pipeline location. The future pipeline as currently being considered may not be in compliance with the Grand Junction RMP.

The Grand Junction RMP and Record of Decision (ROD) describe management decisions based on geographic pieces of land called emphasis areas (BLM 1987; page 2-39). The proposed well pad lies within emphasis area CO-1, with an emphasis on oil and gas development. The Grand

Junction RMP and ROD further states that “Within each emphasis area, the management of a particular resource will be emphasized over all other resources”. That is not to say that one resource will be excluded. Other resource uses will be allowed so long as they are compatible with management of the emphasized resource. Future proposals will be evaluated in the context of the management philosophy of the emphasis area to determine whether the proposal is compatible.

The proposed well pad would be located on a former oil shale withdrawal imposed in Executive Order 5327, enacted in 1930. The withdrawal was revoked in a land use plan amendment in 2001 (BLM 2001).

The lease stipulations attached to lease COC65131 are shown in Table 1.4-1.

**Table 1.4-1 Lease Stipulations and Lease Notices, Federal Lease COC65131 (2001)
CSU: Controlled Surface Use**

Description of Lands	Stipulations
ALL LANDS within lease	<p>CSU: Deer and Elk Winter Range Stipulation:</p> <p>In order to protect important seasonal wildlife habitat, lease activities such as exploration, drilling, and other development will be allowed only during the period from May 01 to December 01 and on the following portions of this lease: ALL LANDS</p> <p>This limitation does not apply to maintenance and operation of producing wells.</p> <p>This stipulation may be waived or reduced in scope if circumstances change, or if the lessee can demonstrate that operations can be conducted without causing unacceptable impact on the concerns(s) identified.</p>

Only sections included in the proposed action (surface and downhole) are specifically identified in the lease table. Refer to lease COC65131 for all applicable locations and stipulations.

In January 1997, the Colorado State Office of the BLM approved the Standards for Public Land Health and amended all RMPs in the State. Standards describe the conditions needed to sustain public land health and apply to all uses of public lands.

Standard 1: Upland soils exhibit infiltration and permeability rates that are appropriate to soil type, climate, land form, and geologic processes.

Standard 2: Riparian systems associated with both running and standing water function properly and have the ability to recover from major disturbance such as fire, severe grazing, or 100-year floods.

Standard 3: Healthy, productive plant and animal communities of native and other desirable species are maintained at viable population levels commensurate with the species and habitat’s potential.

Standard 4: Special status, threatened and endangered species (federal and state), and other plants and animals officially designated by the BLM, and their habitats are maintained or enhanced by sustaining healthy, native plant and animal communities.

Standard 5: The water quality of all water bodies, including ground water where applicable, located on or influenced by BLM lands will achieve or exceed the Water Quality Standards established by the State of Colorado.

A Land Health Assessment (LHA) has not been completed in the project area. Consequently, a formal description of the existing condition and trend is not available. However, a description of the five standards and a subjective finding on the land health and how the Proposed Action would be expected to impact the condition and trend will be presented in the analysis. These findings are located in Chapter 3 of this document.

1.5 PUBLIC PARTICIPATION

1.5.1 Scoping

National Environmental Policy Act (NEPA) regulations (40 CFR §1500-1508) require that the BLM use a scoping process to identify potential significant issues in preparation for impact analysis. The principal goals of scoping are to allow public participation to identify issues, concerns, and potential impacts that require detailed analysis.

Persons/Public/Agencies Consulted: Scoping, by posting this project application in the BLM GJFO, on the GJFO NEPA log and website on June 30, 2011, was the primary mechanism used by the BLM to initially identify issues. Interested parties such as potentially affected landowners permit holders, local governments and related agencies are notified of well proposals via U.S. Postal Service. Colorado Parks and Wildlife (CPW) and High Lonesome Ranch attended the on-site visit on April 21, 2011. Additionally, the proposed project was discussed at the BLM's NEPA review meeting held December 5, 2011.

Other procedures are followed by operators during the Application for Permit to Drill process. This process includes posting and notices in conjunction with the Colorado Oil and Gas Conservation Commission (COGCC).

1.5.2 Resource Not Analyzed

The BLM NEPA Handbook states “You must prepare NEPA analyses using an interdisciplinary approach, and the disciplines of the preparers must be appropriate to the scope of the analysis and to the issues identified in the scoping process (40 CFR 1502.6). . . . The Council on Environmental Quality (CEQ) regulations require NEPA documents to be “concise, clear, and to the point” (40 CFR 1500.2(b), 1502.4). Analyses must “focus on significant environmental issues and alternatives” and be useful to the decision-maker and the public (40 CFR 1500.1). Discussions of impacts are to be proportionate to their significance (40 CFR 1502.2(b)). Similarly, the description of the affected environment is to be no longer than is necessary to understand the effects of the alternatives (40 CFR 1502.15). “Most important, NEPA documents must concentrate on the issues that are truly significant to the action in question, rather than amassing needless detail” (40 CFR 1500.1).

The following resources were evaluated and determined that they were not present or not impacted by the Proposed Action:

- Tribal and Native American Religious Concerns - Cultural inventories were conducted and no concerns were identified. The Ute have a generalized concept of spiritual significance that is not easily transferred to Western models or definitions. As such the BLM recognizes that they have identified sites that are of concern because of their association with Ute occupation of the area as part of their traditional lands. No sites of concern were located during the field inventory. There is no known evidence that suggests that the project area holds special significance for Native Americans for traditional or religious purposes and the project would not alter or limit any access if there were traditional uses that are not known to the agency. Accordingly, no Native American Indian consultation was conducted for the proposed undertaking.
- Environmental Justice - The proposed activities are in a rural area and an existing workforce would conduct the work on the project. Minority and low-income populations are dispersed throughout the region and would not suffer disproportionately high and adverse effects.
- Farmlands, Prime and Unique – None occur in the project area or any that would be affected by offsite impacts.
- Wilderness and Wilderness Characteristics – None occur in the project area or any that would be affected by offsite impacts.
- Wild horses and burros – No wild horses or burros occur within the project area or in areas where the proposed well pad or drilling operations could impact them.
- Special Designations (Areas of Critical Environmental Concerns (ACECs,) SMAs, etc.) – There are no specially designated areas that could be impacted by the proposed well pad or drilling operations.
- Wild and Scenic Rivers – There are no stream segments near the proposed well pad that have been found suitable for designation as wild or scenic (BLM 2009a).
- Forestry – There will be no Pinyon Pine/Juniper forest habitat impacted within the proposed well pad.

1.6 DECISION TO BE MADE

Based on the analysis contained in this EA, BLM will decide whether to approve the proposed Cow Ridge P08 798 well pad project, and proposed wells (CR CR04D-9 P08 798, and CR DH7A-4 P08 798). Analysis of the potential surface pipeline that would connect P08 798 to KM B07 799 will not be completed at this time. If an application is received for a pipeline ROW, a separate environmental analysis will be completed.

For the Cow Ridge well pad and proposed wells, this EA will analyze the environmental impacts and determine whether activities would either; 1) result in a Finding of No Significant Impact (FONSI) to the human environment or 2) that the Proposed Action warrants the development of an Environmental Impact Statement. The BLM may choose to: a) accept the project as proposed, b) accept the project with modifications/mitigation, c) accept an alternative to the Proposed Action, or d) not authorize the project at this time. The finding associated with this EA may not constitute the final approval for the Proposed Action.

Should the Proposed Action be approved, it would include mitigation measures identified during the analysis to alleviate resource impacts in accordance with the objectives and decisions of the Grand Junction Resource Area RMP (BLM 1987), as well as other applicable policies, regulations, and laws that define BLM's multiple use mandate.

CHAPTER 2 - PROPOSED ACTION AND ALTERNATIVES

2.1 INTRODUCTION

The purpose of this chapter is to provide information on the Proposed Action and Alternatives. Alternatives considered but not analyzed in detail are also discussed.

During the on-site visit the issues of excessive noise levels and round-the-clock light for the drilling operators was brought up by High Lonesome Ranch representative, Scott Stewart. These concerns were for the neighboring residents, Mr. and Mrs. McClennon who were unable to attend the onsite but were represented by Mr. Stewart. The original proposed location required crossing a large ephemeral drainage that was of concern. This location was withdrawn from the proposal and is discussed in Section 2.3.

2.2 ALTERNATIVES ANALYZED IN DETAIL

2.2.1 Proposed Action

The Proposed Action is the construction of a well pad (P08 798), two natural gas wells, and access road located on BLM managed lands. The project would be located in Section 8, Township 7 South, Range 98 West, 6th P.M. The well pad and access road would encompass roughly 6.4 acres of initial disturbance, which would be reduced to 1.7 acres for the long term (after interim reclamation) (Table 2.2.1-1). Encana intends to perform a continuous flow test through combustion for up to 60 days. After that time period the well(s) would be shut in. Should the wells associated with these APDs prove successful, Encana projects one additional well may be located on this pad. Encana is reviewing plans for the construction of an 8 inch, 8 mile long, surface pipeline to move natural gas from the site to a mid-stream pipeline and ultimately to consumers. An application for this pipeline would be submitted if these wells prove successful. Figure 1 shows the proposed well pad and access road (a pipeline route has not been determined at this time). The Surface Use Plan of Operations (SUPO), submitted by Encana, is attached as Appendix B.

Table 2.2.1-1: Summary of Disturbance Acres

	Disturbance Acres
Well Pad	6.177
Access Road	0.2
Pipeline	N/A
Total	6.377

The two proposed wells would be drilled to vertical depths of approximately 8,373 and 9,898 feet below ground level. An additional horizontal well would be planned if these wells are successful. Encana estimates pad construction to take approximately 2 weeks. Drilling of the

first well is expected to take approximately 3 weeks, and drilling of the second well is expected to require approximately 4 weeks. Weather would play a part in the length of time needed to complete both wells. Encana has no time estimate for drilling of the potential 3rd well.

Access

The site is accessed from DeBeque by proceeding north on Mesa County Road 45 to the Garfield County line. From that point the road becomes Garfield County Road 204 (CR 204) to the intersection of County Road 202 (CR202). The proposed access to the well pad is located approximately 2.4 miles west on CR202 from the 204/202 intersection. From Garfield County Road 202, the 291 foot access road to the pad site would need to be constructed to provide for all weather access suitable for safe use by the anticipated truck traffic. The access road would require approximately 50 feet of construction width and 18 to 22 feet travel width. The road construction and improvement would be done in accordance with BLM Manual Section 9113 standards. Encana would install three 18 inch culverts on the proposed access road, to manage stormwater, as indicated in the plats.

Ancillary Facilities

Self-contained travel-type trailers may be used on site during drilling operations. The trailers would be certified Colorado Department of Housing units. These units would be used by essential personnel and would abide by Federal, State, and local regulations that directly pertain to Temporary Employee Housing. Potable water would be provided by water haulers certified by the Colorado Department of Public Health and Environment (CDPHE). Septic would be held in Garfield County approved engineered ISDS Vault and Haul systems. Waste materials generated by and from these units would be contained in wildlife proof containers and would be hauled weekly, or as needed. For more information on ancillary facilities to be located at the pad site see Appendix B.

Water Supply

Water for the project would be delivered to the well pad via truck hauling. The water source may be from 1) recycled flow back water, frac water from completion, operations, production water gathered from producing wells, or some combination thereof resulting from ongoing operations in the Piceance Basin that may be treated for reuse, and/or 2) fresh water from available water rights in the Piceance Basin. During free water conditions fresh water would be pulled from West Fork on Encana's North Parachute Ranch and trucked to the well site. The estimated water use for construction, drilling, dust suppression and completion is estimated at 615,000 bbls (79.3 acre-feet) of produced, recycled or fresh water.

Waste Disposal

Disposal of any liquid and solid waste generated during the term of the project would be done at an approved facility and in an environmentally sound and approved manner. Additional details are included on page 4 of the SUPO (Appendix B)

No pits are planned for the site; a closed loop system would be used and cuttings would be contained in a steel cuttings bin, where they would be solidified with sawdust and moved to a cuttings pile. Cuttings would be managed per COGCC rules, and tested before ultimately used for pad reclamation and contouring prior to application of the topsoil layer. In the event that pits are utilized, they would be constructed, operated, and maintained in accordance with applicable BLM/COGCC rules and regulations. Produced fluids during natural gas production operations

would be confined to flow back tanks on location. Produced fluids may be recycled and reused during drilling/fracing operations on other well areas or locations or disposed of via truck haul to Encana-owned disposal sites. The closest Encana-owned disposal site is the Logan Wash Federal Disposal Well 1 located in 6 PM, 8S, 97W, Section 6, SE1/4, NE1/4. The commercial disposal facility, Danish Flats in Cisco, Utah, may also be used for disposal of produced waste water (Appendix B).

Stormwater Management

Design features are standard operating procedures, Best Management Practices (BMPs) are other measures used to reduce or avoid adverse impacts. The SUPO is included as Appendix B and can be referred to for specific design features that would be used. For details on how the stormwater features of the well pad and access road are handled during preconstruction, construction, interim, and final reclamation refer to the Roan Creek Area Stormwater Management Plan COR-039310 (Encana 2009). This plan is available upon request at the operator's field office.

Interim/Final Reclamation

Prior to commencement of any reclamation projects the BLM would be contacted. Immediately upon well completion, the well location and surrounding area(s) would be cleared of all debris, materials, trash, and junk not required for production. Upon completion of the initial well on the pad, Encana would evaluate the economics of the wells; there is a possibility of three different scenarios:

- 1) Assuming the first well proves to be economical, Encana may return to drill the remaining wells that are planned for this location; interim reclamation would be applied within 6 months of the completion of the last well.
- 2) If the area is not economic enough to warrant drilling the remaining wells within reasonable timeframe (1 year) then interim reclamation would be applied within the year.
- 3) If the well is not economically viable, the well may be plugged-final reclamation standards would be applied to the pad and access road.

During interim reclamation, the proposed pad would be reclaimed except for a working area, which is usually 100 feet off wellheads and 10 to 15 feet around production equipment. The proposed unreclaimed surface would be approximately 1.7 acres.

If the well is a producer, Encana would upgrade and maintain access roads as necessary to prevent soil erosion and accommodate year round traffic. Areas unnecessary to operations would be reshaped. Topsoil would be redistributed and disked. All areas outside of the work area would be reseeded according to BLM approved seed mix.

Encana would implement the best available weed control techniques at the appropriate times based on the life history of the weed species. Only adjuvants and herbicides approved by the BLM shall be applied to BLM lands. A pesticide record would be filled out each time pesticides are applied to public lands. The operator would maintain these records for three years. Herbicide use would follow application rates, restrictions, and warnings as listed on the label. In situations where noxious weeds have escaped from the project into adjacent sites, the infested

areas shall be treated to prevent further expansion into un-infested areas and re-infestation of the treated area.

During final reclamation all storm water management BMP's would be removed. The site would be revegetated, seeded and recontoured. Perimeter straw wattles would remain in place until vegetation establishment meets minimum requirements.

2.2.2 No Action Alternative

NEPA requires that a No Action Alternative be considered in an EA, regardless of the purpose and need or proposal feasibility. In cases such as this, where the subsurface is encumbered with Federal oil and gas leases the lessee has a right to explore and develop the leases; however, BLM has the authority to deny individual APDs. Under the No Action Alternative, the proposed APDs, that would approve drilling into the federal mineral estate, would be denied by the BLM.

2.2.3 Other Alternatives

No significant issues were identified in scoping that would lead to the development of additional alternatives. Consequently, no other viable alternatives have been identified for analysis.

2.3 ALTERNATIVES CONSIDERED BUT NOT ANALYZED IN DETAIL

Alternative 1: Encana previously submitted an APD in this lease on November 8, 2004, for the Roan Creek Federal 9-2C-798 well. The APD was not completed, expired and was returned July 13, 2006. While this location might have been suitable in 2004, the land ownership has since changed and Encana was unable to obtain private land access at this date, therefore, this alternative was not considered (Mitchell 2011).

Alternative 2: The original APD submissions were for the well pad named M09 798. The onsite inspection was performed to examine proposed well pad M09 798, which was proposed adjacent and east of the proposed action. This location, Alternative 2, would have been split by a deep well-developed ephemeral drainage. As a result of that onsite visit and BLM's subsequent review of that proposal that location was determined to be unsuitable because of potential problems with pad construction causing further instability of the gully and, subsequently, with the integrity of the pad itself. Internal scoping for this location helped to develop the proposed action.

CHAPTER 3 - AFFECTED ENVIRONMENT AND EFFECTS

3.1 INTRODUCTION

This section provides a description of the human and natural environmental resources that could be affected by the Proposed Action (Table 3.1-1) and presents comparative analyses of the direct, indirect and cumulative effects on the affected environment stemming from the implementation of the actions under the Proposed Action and other alternatives analyzed.

This EA draws upon information compiled in the Grand Junction Resource Area RMP/ROD (BLM 1987) and the Grand Junction Resource Area Draft Resource Management Plan (DRMP)/Draft Environmental Impact Statement (DEIS) (BLM 1985a).

Table 3.1-1: Potentially Impacted Resources

Resources	Not Present On Location	No Impact	Potentially Impacted	Mitigation necessary	Comments included in text	BLM Evaluator Initial & Date
PHYSICAL RESOURCES						
Air and Climate	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	ND 12/16/11
Geological	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	DSG 7/7/11
Mineral Resources	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	DSG 1/4/12
Soils	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	ND 12/16/11
Water (surface & subsurface, floodplains)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	ND 12/16/11
BIOLOGICAL RESOURCES						
Invasive, Non-native Species	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	MT 1/4/12
Sensitive Species	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	JFT 1/4/12
Threatened or Endangered Species	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	JFT 1/4/12
Vegetation, Forestry	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	JAM 1/4/12
Wetlands/Riparian Zones	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	CARS 8/11/11
Wildlife	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	JFT 1/4/12
HERITAGE RESOURCES AND HUMAN ENV.						
Cultural or Historical	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	AIL 12/15/2011
Paleontological	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	DSG 1/4/12
Tribal & American Indian Religious Concerns	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	AIL 12/15/2011
Visual Resources	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	CPP 1/11/12
Social	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	CLV 1/5/12
Economic	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	CLV 1/5/12
Environmental Justice	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	CLV 7/7/11
Transportation and Access	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	CPP 1/11/12
Wastes, Hazardous or Solid	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	AEK 1/11/12
LAND RESOURCES						
Prime or Unique Farmlands	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	CLV 7/7/11
Recreation	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	CPP 1/11/12
Special Designations (ACEC, SMAs etc.)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	CPP 7/22/11
Wild and Scenic Rivers	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	CPP 7/22/11
Wilderness and Wild Lands	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	CPP 7/22/11
Range Management	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	JAM 1/4/12
Wild Horse and Burros	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	CLV 12/6/11
Land Tenure, ROW, Other Uses	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	CLV 1/5/12

3.1.1 Elements Not Affected

The following elements, identified as not being present or not affected will not be brought forward for additional analysis: Tribal and Native American Religious Concerns, Cultural and Historic Resources, Environmental Justice, Prime and Unique Farmlands, Wilderness and Wilderness Characteristics, Wetlands/Riparian Zones, Geologic Resources, Special Designations (ACECs, SMAs etc.), Wild and Scenic Rivers, and Wild Horses and Burros.

3.1.2 Past, Present, Reasonably Foreseeable Actions

NEPA requires federal agencies to consider the cumulative effects of proposals under their review. Cumulative effects are defined in the Council on Environmental Quality (CEQ) regulations 40 CFR §1508.7 as "...the impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable actions regardless of what agency...or person undertakes such other actions." The CEQ states that the "cumulative effects analyses should be conducted on the scale of human communities, landscapes, watersheds, or airsheds" using the concept of "project impact zone" or more simply put, the area that might be affected by the Proposed Action. The area that may be affected by this project includes portions of the Roan Creek and Kimball Creek drainages. To assess past, present and reasonably foreseeable actions that may occur within the affected area a review of GJFO NEPA log and field office Geographic Information System (GIS) data was completed. The following list includes all past, present and reasonably foreseeable actions known to the BLM, which may occur within the affected area:

Past Actions: Oil and gas exploration and development, and livestock grazing activities have been prevalent uses in the past on private and public lands in these watersheds. Hunting is also a recurring recreational activity in the fall. Private lands have been used for irrigated agriculture, homestead, commercial outfitting/guiding, energy development, hospitality and livestock grazing.

Present Actions: Development of oil and gas facilities is continuing throughout the Roan Creek and Kimball Creek watersheds. Other activities such as livestock grazing, agriculture, homestead, commercial outfitting/guiding, energy development, hospitality and recreation continue to be important activities. Recently, the ownership and emphasis of private land has begun to shift away from typical family farm ownership objectives to more diverse management objectives that include activities such as guiding and outfitting for hunters.

A nearby occupied residence is located 0.6 miles east of the proposed wells. The location would be visible from the residence as there are no landforms that obstruct this view.

Reasonable Foreseeable Actions: Oil and gas development, livestock grazing, hunting, and other outdoor recreation activities are expected to continue on both public and private lands. Agricultural activities and other developments are likely to continue on private lands. Changes in private land ownership and development are likely to continue the shift away from conventional family based agriculture.

This list of past, present and reasonably foreseeable actions was considered when analyzing cumulative effects in Sections 3.2, 3.3, 3.4, and 3.5 below.

3.2 PHYSICAL RESOURCES

3.2.1 Air Quality and Climate

Current Conditions: Air quality in the project area is typical of undeveloped regions in the western United States. The project would be located in the Colorado Air Pollution Control Division's (CAPCD) Western Counties Monitoring Area (CAPCD 2008). No designated Class I airsheds are located within the vicinity of the project area. The closest Class I airsheds are the Black Ridge Canyons, Flat Tops and Maroon Bells Wilderness Areas and the wilderness portion of the Black Canyon National Park (CAPCD 2010). The Black Ridge Canyons area is approximately 35 miles southwest of the project area. The other areas are more than 60 miles to the east and southeast from the project area. The State of Colorado limits the incremental amount of sulfur dioxide (SO₂) allowed in Dinosaur and Colorado National Monuments (approximately 60 miles northwest and 35 miles southwest respectively).

The primary source of air pollution in the Western Counties Monitoring Area is fugitive dust from natural sources, unpaved roads, seasonal road sanding, motor vehicles, and wood burning stove emissions. Suspended particulate matter, with a diameter equal to or less than 10 micrometers (PM-10), is of the greatest concern from a human health standpoint. Seasonal wildfire throughout the western United States may also contribute to air pollutants and regional haze. The ambient pollutant levels are usually near or below measurable limits, except for high short term increases in inhalable particulate matter (PM-10) levels caused primarily by wind-blown dust. Considering the prevailing wind, Grand Junction and Clifton are the closest air quality monitoring stations that collect PM-10 levels. PM-10 levels at those locations are consistently below the 150 milligrams/cubic meter National Ambient Air Quality standard (CAPCD 2008). Occasional peak concentration of carbon monoxide (CO) and SO₂ may be found in the immediate vicinity of combustion equipment, but would not be of general concern in the project area. Locations vulnerable to decreasing air quality are primarily local population centers. Representative monitoring of air quality in the general area indicates that the existing air quality is well within Colorado and National Ambient Air Quality Standards (CAPCD 2008). Since the project area is not within a non-attainment or a maintenance area, the Clean Air Act conformity regulations do not apply.

The project area is approximately 5,640 feet in elevation. The climate of the area is semi-arid.

Based on weather records from Rifle, Colorado, (WRCC 2010) the average annual precipitation is approximately 11.6 inches, spread relatively evenly throughout the year. Average annual temperatures range from a maximum of 64.3 degrees Fahrenheit (F) to a minimum of 31 degrees F. Average monthly maximum occurs in July (90 degrees F) and average monthly minimum occurs in January (9.3 degrees F). Frost-free days generally occur between mid-May and mid-September. Winds are generally from the west.

No Action

Direct and Indirect Effects: Under the No Action Alternative, the Proposed APD would not be approved; consequently, there would be no air quality impacts from gas well drilling at this location.

Cumulative Effects: Impacts associated with fugitive dust, carbon monoxide, ozone (secondary pollutant), nitrogen dioxide, natural gas, and sulfur dioxide would continue in the area as a result of energy development, road construction and maintenance, and agricultural activities. Some of the above air pollutants would be products moved into the area from urban areas some distance from the proposed project location.

Venting/flaring of natural gas from fee and federal wells elsewhere in the Roan Creek watershed would still occur, leading to some increase in greenhouse gas emissions.

Proposed Action

Direct and Indirect Effects: During the 2-week construction period and the 7 weeks of drilling, the air quality criteria pollutant likely to be most affected by the activities is inhalable particulate matter, specifically fugitive dust (PM₁₀). As is the case with all drilling operations, slight increases in the following criteria pollutants: carbon monoxide, ozone (secondary pollutant), nitrogen dioxide, and sulfur dioxide may also occur during construction and drilling operations due to the combustion of fossil fuels. However, except right on the construction site, levels would be well below applicable air quality standards. The proposed drilling project would not result in any detectable change in air quality at the local level or at a regional scale.

Emissions of particulate matter would be reduced through control of dust during construction and drilling activities by way of the application of water, appropriate construction of the access road, surfacing to suit the expected truck traffic, and upgrading of the access road if the well is a producer. Dust abatement provisions are part of the SUPO (Appendix B). The operator must also comply with other Federal and state air quality regulations. Following successful re-vegetation, airborne particulate matter from this site should return to, or near, pre-construction levels. On a per well basis, natural gas could be vented during initial production testing not to exceed 30 days or the production of 50 MMcf of gas, whichever occurs first. Natural gas could be vented during purging and evaluation tests not to exceed a period of 24 hours (pursuant to Notice to Lessee 4A (USGS 1980). Because there is no pipeline at this location, some volume of natural gas would be vented or flared to the atmosphere. No noteworthy impacts to air quality, long term or short term, are expected as a result of implementing the Proposed Action. Drilling and production activities would be required to comply with the COGCC Aesthetic and Noise Control Regulations which, in part, regulate the emission of volatile organic compounds and dust (COGCC 2009).

The emissions of natural gas, a greenhouse gas, associated with this project would result in some incremental increase in greenhouse gas emissions. However, standardized protocols for measuring the impacts on global warming as a result of localized projects such as this one do not currently exist. This proposed drilling operation is not expected to result in any detectable effects on global warming or climate change.

Cumulative Effects: When added to the fugitive dust, carbon monoxide, nitrogen dioxide, natural gas, and sulfur dioxide being emitted in the area as a result of energy development and other human activities the effects of this drilling project, including greenhouse gas emissions are likely to be undetectable within the project area or in the Colorado's Western Counties Monitoring Area.

Protective/Mitigation Measures

None in addition to those included in the SUPO.

3.2.2 Mineral Resources

Current Conditions: Oil and gas exploration and development is a prevalent activity in the Piceance Basin. During 2010, COGCC issued over 2,000 well permits in Garfield County (Colorado Energy News 2011). The project area is between the Grand Valley and Castle fields and production is predominantly oil and natural gas. There are four existing well records including the Proposed Action in 6 PM T7S R98W (COGCC 2011). The status of three of the wells is pending information. Information from a 1993 well completed in Section 34 indicates encountering the Mesa Verde at 1,212 feet, the Cameo at 3,662 feet, the Rollins at 3,956 feet, the Cozzette at 4,138 feet, the Corcoran at 4,417 feet, the Mancos at 4,574 feet, the Frontier at 8,453 feet, the Dakota at 8,896 feet, Cedar Mountain at 9,078 feet and with total depth in the Morrison at 9,290 feet (COGCC 2011). This hole was plugged and abandoned. The proposed wells in Section 8 would likely encounter these formations at similar depths.

Economic minerals in the area include oil and natural gas, oil shale, sand and gravel and sodium bicarbonate (nahcolite) (CDRMS 2011). Colorado Division of Minerals and Geology in Garfield County has no recorded mines in T7S, R98W. However, oil shale projects exist to the east and northeast, coal to the west, sodium bicarbonate to the north and several sand & gravel operations along the Colorado River and Roan Creek.

No Action

Direct and Indirect Effects: There would be no impacts to mineral resources if this APD is not approved.

Cumulative Effects: Existing and future fee and federal wells would continue the extraction of natural gas in this area and within the Piceance Basin.

Proposed Action

Direct and Indirect Effects: Impacts to mineral resources are limited to the potential removal of natural gas, petroleum fluids, and water from the hydrocarbon production zones. If successful, the proposed well would add to the royalties from natural gas that is contributed to the federal government.

Cumulative Effects: Cumulative effects would be essentially the same as the No Action alternative with a slight increase in extraction.

Protective/Mitigation Measures: None.

3.2.3 Soils (includes a finding on Standard 1)

Current Conditions: The soils on the project area were surveyed and are described in the Douglas Plateau Area, Colorado, Parts of Garfield and Mesa Counties, Soil Surveys (USDA 2010). The soil map unit where the well pad would be located is Unit 54, Panitchen loam that occurs between 4,800 to 5,800 feet and receives 12 to 16 inches of annual precipitation. The Panitchen loam soils occur on flood plains and terraces with slopes from 1 to 6 percent, and are derived from a mixture of formations. As shown in **Table 3.2.3-1**, Panitchen loam is moderately resistant to wind erosion, has a high infiltration rate, and has a moderate erosion hazard.

Table 3.2.3-1: Three Soil Map Units in the Project Area

Soil Unit Name	Ecological Site	Salinity mmhos/cm)	Erosion Hazard off road/trail	Surface Runoff (Hydrologic Soil Group) ¹	Rutting Hazard	Wind Erosion ²	K _w Factor ³
Happle very channery sandy loam, 3 to 12 percent slopes	Convex Slopes	Non-saline 1.0	Slight	B	Severe	8	.010
Panitchen loam, 1 to 6 percent slopes	Foothill Swale	Very Slightly to Slightly 6.0	Slight	B	Severe	4	0.37
Biedsaw-Sunup gravelly loam, 10 to 40 percent slopes	Foothill Juniper	Slightly to Moderately	Moderate/ Severe	B	Severe	4	0.37

1 - Hydrologic Soil Group: **A** soils having a high infiltration rate even when thoroughly wetted (estimated range of water infiltration 1.00 – 8.30 inches/hour), **B** soils having a high infiltration rate even when thoroughly wetted (estimated range of water infiltration 1.00 – 8.30 inches/hour), **C** soils have a slow infiltration rate when thoroughly wetted (estimated range of water infiltration 0.17 – 0.50 inches/hour), **D** soils have a very slow infiltration rate when thoroughly wetted (estimated range of water infiltration 0.02 – 0.17 inches/hour)

2 - Wind Erodibility Group- soils assigned to group 1 are the most susceptible to wind erosion, and those assigned to group 8 are the least susceptible.

3 - Erosion factor Kw (whole soil) - Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Values of K range from 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water.

Upslope of the pad location on the steeper slopes the soil is Biedsaw-Sunup gravelly loam (soil map unit 7) with slopes of 10 to 40 percent. Downslope of the proposed well pad location, south of CR 202, the soil is Happle very channery sandy loam (soil management unit 44). This is a rolling loam range site with slopes ranging from 3 to 12 percent. Some of the chemical, physical and biological characteristics of the soil described above are listed in Table 3.2.3-1.

- *Current conditions of the Public Land Health Standard for upland soils:* LHAs have not been conducted in the vicinity of the proposed well pad and access road, however, field observations by WestWater Engineering (WWE) employees, indicate that the soils on this site are meeting land health standards.

No Action

Direct and Indirect Effects: Denial of the APD would not result in any impacts to soil resources on the site.

Cumulative Effects: Soils in the Roan Creek and Kimball Creek area would continue to be impacted by energy development, road construction and maintenance, agricultural activities, private land development, and natural wind and rainfall events.

-Finding on the Public Land Health Standard for soils: There would be no effects to land health standards for soils on public land from not implementing the Proposed Action.

Proposed Action

Direct and Indirect Effects: The construction would result in a disturbance of approximately 6.4 acres of soil, with the majority of it (6.3 acres) being Panitchen loam. This area would be bladed and leveled, which would remove vegetation, surface rock, physical and biological soils crusts, and plant litter. This results in the loss of protection for soils from the forces of wind, raindrop impact, and overland flow. During construction activities, vehicle traffic and other equipment use would result in some soil compaction, which would diminish water infiltration rates (increase runoff and erosion volumes) until natural soil bulking factors, such as frost heave and biological activity within the soil matrix, restore the soil surface to pre-construction conditions.

In accordance with the BMP measures in the Roan Creek Area Storm Water Management Plan (SWMP) COR-039310 (Encana 2009) and the SUPO for CR P08 798, erosion control measures such as, detention ponds, culverts, drainage diversions, seeding of unused areas, straw wattles, sediment traps, and other structural and non-structural erosion control measures would be utilized. All topsoil stripped from the pad location would be stockpiled, and mulched and seeded. Although the actions described in these plans would minimize erosion there would still be some minor short-term and long-term soil erosion. All roads would be constructed in compliance with BLM Handbook 9113 ((BLM 1985b). If the well is a producer, Encana would upgrade and maintain access roads to reduce erosion. Interim reclamation would reduce the pad size to 1.7 acres with seeding and surface stabilization techniques as described in the SUPO, which would result in reduced potential for soil erosion. After final reclamation, soil stability should be restored to pre-construction conditions.

Cumulative Effects: The cumulative effects of the Proposed Action would essentially be the same as those described under the No Action Alternative.

-Finding on the Public Land Health Standard for soils: At a watershed scale, there would be no effects to soils land health standards on public land as a consequence of the drilling activity.

Protective/Mitigation Measures: None beyond those in the SWMP and SUPO.

3.2.4 Water (surface and groundwater, floodplains) (includes a finding on Standard 5)

Current Conditions: The proposed well pad and access road are located approximately 0.2 miles north of Kimball Creek (T7S, R98W). It is within the Upper Colorado Region – Colorado Headwater-Plateau (Hydrologic Unit Code (HUC) 14010005) (CDWR 2011). Runoff from the project area would drain into Kimball Creek, into Roan Creek, and ultimately the Colorado River. Table 3.2.4-1 shows the stream classifications for surface waters in the project area.

In addition to the state’s water quality classifications and numeric standards, all surface waters of the State are subject to the Basic Standards (CDPHE 2010a), which in part reads: state surface waters shall be free from substances attributable to human-caused point or nonpoint source discharge in amounts, concentrations or combinations that:

1. Can settle to form bottom deposits detrimental to the beneficial uses (e.g., silt and mud).
2. Are harmful to the beneficial uses or toxic to humans, animals, plants, or aquatic life.
3. Produce a predominance of undesirable aquatic life.

Table 3.2.4-1: Watershed (Hydrologic Unit Code) and Stream Classifications

Watershed	Stream Segment and Description	Stream Classifications
14010006 Parachute-Roan	14b Roan Creek, including all wetlands and tributaries from its source to a point immediately below the confluence with Kimball Creek (segments 14a and 14b in state stream classifications)	Aquatic Life Cold ¹ Recreation P ² Agriculture ³ Water Supply ⁴
14010005 Roan-Colorado	14c Mainstem of Roan Creek including all tributaries and wetlands, from a point immediately below the confluence with Kimball Creek to the confluence with the Colorado River	Aquatic Life Warm ¹ Recreation P ² Agriculture ³ Water Supply ⁴

1- Waters are designated either warm or cold based on water temperature regime. Class 1 waters are capable of sustaining a wide variety of cold or warm water biota, while class 2 waters are not.

2- Recreation Class P - Potential Primary Contact Use. These surface waters have the potential to be used for primary contact recreation.

3- Waters suitable for irrigating crops usually grown in Colorado.

4- Waters that are suitable or intended to become suitable for potable water supplies.
(CDPHE 2010b)

Colorado’s Monitoring and Evaluation List (M and E List), (CDPHE 2010c) identifies water bodies where there is reason to suspect water quality problems, but there is also uncertainty regarding one or more factors, such as the representative nature of the data. The main stem of Roan Creek including all tributaries from Kimball Creek to the Colorado River is on the M and E List for potential water quality standard accidents of selenium. Segment 14b is identified as a water body whose classifications are appropriate for High Quality 2 designation (CW1 or WW1 and Rec 1), but had quality not suitable for a water supply classification or 85th percentile values of one or two parameters exceeding the criteria for Class 1 Aquatic Life, or may not meet the water quality criteria based on the best available information. Also, Segment 14b is identified as cold stream tier two (CS-II).

Stream flow and water quality data from the U.S. Geological Survey (USGS) was collected from October 1962 to September 1968 on Roan Creek approximately 3.5 miles upstream of the confluence with Kimball Creek. These data (Table 3.2.4-2) show Roan Creek experiences high flow from snowmelt, mostly during the months of May and June. In July, flow significantly drops and mostly remains at low base flow levels until the following snowmelt season. Short duration, high flow events can occasionally occur from summer precipitation events. A water-quality sampling effort conducted by Olsson and Associates during July 2010, (Olsson and Associates 2010) along Roan Creek in the general vicinity of Kimball Creek showed the water’s electrical conductance to consistently be in the range of 690-to-710 umhos/cm, which is typical of waters drained from similar sedimentary geology in the region.

**Table 3.2.4-2: Stream Flow - Roan Creek above Clear Creek near DeBeque, Colorado¹
(USGS Gage # 09094200)**

YEAR	Monthly mean in cfs (Calculation Period: 1962-10-01 -> 1968-09-30)											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1962										7.99	10	8.83
1963	7.71	10.5	9.26	10.5	11.2	9.73	6.62	6.86	5.15	3.25	2.5	2.71
1964	3.35	3.8	5.93	8.48	13.7	14.2	8.46	6.49	4.43	3.69	4.87	6.4
1965	6.54	4.71	5.95	12.3	188.3	77.7	26	18.8	14.6	10.7	9.48	11.4
1966	8.29	9.03	23.8	23.7	46.5	25.4	13.1	7.22	6.89	4.98	5.46	5.77
1967	6.02	7.59	11.4	13.9	22.3	22.1	19.5	12.7	7.6	4.86	5.62	5.5
1968	6.04	8.08	9.82	16.8	149.4	80.2	26	25.9	9.81			
Mean Monthly Flow (cfs)	6.3	7.3	11	14	72	38	17	13	8.08	5.9	6.3	6.8

¹ Data source: U.S. Geological Survey, National Water Information System, (USGS 2011a)

Table 3.2.4-3 summarizes the surface water quantity and quality of the drainages in the general vicinity of the Proposed Action. These data are from the BLM, GJFO water quality monitoring database, and are averages of approximately 30 samples on each site collected between the mid-1970s to present, and during the spring and summer season. In addition to both stream flow and water temperature progressively increasing towards the mouth of Roan Creek, the electrical conductivity, which roughly estimates the concentration of total dissolved solids, shows a significant increase, potentially from the contribution of Kimball Creek.

Table 3.2.4-3: Water Quantity and Quality of Surface Waters¹

Station	Flow cfs	Temperature C	Electrical Conductivity uS/cm	Dominant Ions
Upper Roan Creek (~2 mi upstream from the Proposed Action)	5.4	11.2	585	Sodium-sulfate
Roan Creek near DeBeque	33.07	20.2	2,024	Sodium-sulfate
Carr Creek	6.12	12.4	713	Sodium-bicarbonate
Clear Creek	9.74	13.8	721	Sodium-bicarbonate
Kimball Creek	5.13	16.5	2,150	Sodium-sulfate

¹ BLM 2010, Grand Junction Field Office water quality monitoring database

Groundwater Quality

Ground water aquifers are limited in the general area due to the semiarid climate and incised topography. The proposed gas well is located in an alluvial deposit along Kimball Creek, a moderately incised stream. The Kimball Creek Alluvial Aquifer is present in the area of the proposed well.

A review of the USGS Groundwater Atlas of Colorado (USGS 2011b) indicates the project area is part of the Colorado Plateau aquifers, which are contained in a thick sequence of poorly to well-consolidated conglomerate, sandstone, siltstone, and shale. Specifically, the Uinta-Animas aquifer is the uppermost water-yielding unit in the general area. The Mesaverde aquifer is present at depth in the upper Cretaceous formations.

The Colorado Division of Water Resources (CDWR) Aquamap shows 3 groundwater wells within a mile radius of the Proposed Action (Sections 4, 16 and 18). The depths of these wells suggest the presence of an alluvial aquifer at least 70 feet below surface (CDWR 2011a, b).

Water Rights

Several wells are developed in the alluvium along both Roan and Kimball Creeks in the general area (CDSS 2011). The Colorado Decision Support System (CDSS) shows that in T7S, R98W there are 3 records of diversion points in Section 17 and no surface water rights in Section 8. There is one water well permit (No. 11936) located to the east of the proposed well pad in Section 16 (CDWR 2011), which is 115-feet deep and is used for domestic purposes.

- *Current status of Public Land Health Standard for water quality:* Anecdotal evidence suggests that downstream public lands are meeting water quality land health standards.

No Action

Direct and Indirect Effects: Under the No Action Alternative, the Proposed Action would not be approved and any direct and indirect effects to surface water, floodplains or groundwater on public lands would not occur. Potential mixing of groundwater aquifers may still take place as a result of drilling of wells on private surface into fee minerals.

Cumulative Effects: Surface disturbance and gas well drilling impacts related to development on private and public lands would continue to take place, with their potential to impact surface and groundwater resources. The No Action alternative should have no impact on cumulative effects in the area.

-Finding on the Public Land Health Standard for Water: There would be no effect to water quality that would influence the Public Land Health Standard #5 in streams or floodplains on public land downstream of Kimball Creek.

Proposed Action

Direct and Indirect Effects: Drilling would result in natural gas and associated water being produced from the hydrocarbon producing zones. When produced water cannot be recycled it would be disposed of in accordance with State and Federal requirements and have no impact on surface or groundwater quality.

Surface water quality impacts associated with the Proposed Action are expected to be minimal. With the total soil disturbance of 6.4 acres, and increased use of the County roads, some amount of additional sediment would be transported to the receiving drainage network and become additive to the natural sediment load. Erosion and sediment control BMPs as found in Encana's Roan Creek Storm Water Management Plan (Encana 2009) and the SUPO for this well location would minimize erosion and sedimentation as much as possible. Practices that would limit erosion and sediment transport include: the installation of appropriately sized culverts, sloping of the pad location to retain stormwater runoff, interim and final seeding with BLM's recommended seed mix, cut and fill slopes would be protected against erosion with water bars, rock armor, straw bales, fabric silt fence, aspen matting, or other measures required by the Authorized Officer (AO), stormwater would be managed in accordance with Encana's SWMP under a general permit from the CDPHE, after well completion pad size would be reduced to 1.7 acres and slopes contoured to minimize the areas exceeding a 3:1 slope.

Drilling and potential gas production from the well could result in spills or releases of drilling fluids, fracturing fluids, produced water, hydrocarbons or other hazardous materials associated with the well development. Fluids and chemicals used for the project could potentially contaminate surface and/or ground water. Impervious dikes constructed around production facilities that hold fluids would reduce the potential for spills that may reach surface waters. As drilling proceeds, aquifers may be encountered throughout the geologic strata (refer to Geologic Resources Section). Encana's Spill Prevention and Countermeasure Plan would be complied with during the entire life of the pad and wells (Encana 2011a). The measures in that plan would reduce the potential for the above chemicals or fluids from causing negative impacts to surface or groundwater quality.

Groundwater

As drilling proceeds, aquifers may be encountered throughout the geologic strata. Encana's approach and standard procedures are provided in their online website (Encana 2011b). Encana's natural gas wells have an engineered steel casing system that is cemented externally to prevent any fluids from migrating between groundwater aquifers. The casing design and cementing program conform to an established design that ensures the integrity of casing and cement system through field inspection and wellbore logging.

Hydraulic fracturing (fracing) is a controlled operation that pumps a fluid and a propping agent through the wellbore to the target formation at a high pressure in multiple intervals, or stages. Micro-seismic analyses and electronic wellbore logging, is used to confirm the fracture treatment is executed as designed and does not migrate out of the targeted formation.

Drilling procedures as described above would isolate the water in geologic formations and, if properly done, would prevent the migration of gas, water, and oil between formations.

Impervious dikes around all fluid retention structures around production facilities should eliminate the potential for shallow or deep groundwater contamination.

Cumulative Effects: Impacts to surface and groundwater resources may still occur as a result of gas well drilling on this and adjacent private lands in the area. Cumulative effects would be slightly greater, but essentially identical to, the No Action alternative.

-Finding on the Public Land Health Standard for Water Quality: Under this alternative, water quality on private land downstream of the project location may experience a slight negative effect; however, this is not expected to result in a detectable impact to public land water quality health standards.

Protective/Mitigation Measures: Where roads cross such ditches or drainages, culverts shall be sized to prevent obstruction to the free flow of the volumes of water being carried, inclusive of flood stages. Operator shall protect all water sources and conveyance structures, including but not limited to, wells, ditches, ponds, and the natural flow of creeks from all operational activities, and shall immediately remedy any diversion, curtailment or blockage of water flows or contamination of water sources caused by Operator activities.

See also Soils Mitigation; Section 3.2.3

3.3 BIOLOGICAL RESOURCES

3.3.1 Invasive, Non-native Species

Current Conditions: The State of Colorado and Garfield County have each developed lists of non-native plants considered noxious within their respective areas (Garfield County 2000; State of Colorado 2010). During biological field surveys conducted by WWE biologists (WWE 2011a) of the proposed well pad, the presence of noxious plant species was documented. Three species of noxious weeds found on the Garfield County or State of Colorado noxious weed lists were noted during biological surveys in 2011. Noxious weeds observed are listed in Table 3.3.1-1.

Table 3.3.1-1: State of Colorado and Garfield Co. listed weeds observed in the project area

Common Name	Scientific Name	Comments/Abundance	Status *
Downy brome	<i>Bromus tectorum</i>	Scattered throughout the project area	C
Field bindweed	<i>Convolvulus arvensis</i>	Extensive along the shoulders of CR 202	C
Jointed goatgrass	<i>Aegilops cylindrica</i>	Extensive along the shoulders of CR 202	B,G

* State Weed Listing = A List, B List, C List; Garfield County Weed List = G

Downy brome is scattered throughout the understory of the sagebrush shrublands of the project area. Downy brome was infrequently the most abundant plant within the herbaceous layer of vegetation, and never so abundant as to totally exclude other species. Field bindweed and jointed goatgrass are present near the proposed pad location along CR 202.

No Action

Direct and Indirect Effects: Under the No Action Alternative, the well pad would not be constructed; therefore, no new infestations of invasive non-native species would occur as a result of the project.

Cumulative Effects: Noxious weeds are currently quite prevalent in previously developed areas in the vicinity of the proposed project. Energy exploration is expected to continue throughout the region, including Roan Creek and Kimball Creek drainages. These activities, as well as others such as livestock grazing, agriculture, hunting and development of private lands in the area, have the potential to contribute to the proliferation of noxious weeds in the local area. Existing infestations are likely to spread if not treated. Left untreated, these infestations may reduce available forage for big game species and domestic livestock in the area over the long term.

Proposed Action

Direct and Indirect Effects: With the exception of field bindweed and downy brome, noxious weeds are not widespread in project area. However, the existing infestations of invasive plants in the project area present a high potential for the rapid spread of these undesirable plants. Disturbance resulting from project construction provides opportunity for invasion of noxious weeds at the expense of more desirable species. Disturbed soils related to project development would be particularly susceptible to new noxious weed infestations. Machinery used for construction has the potential to introduce new weed species if not properly cleaned before being moved into the project area.

Encana, as described in the SUPO, intends to treat all noxious weeds when they are found, including those instances where noxious weeds have escaped from the project site into adjacent sites. For control activities, Encana would use the method most appropriate for the timing of disturbance, and appropriate herbicide, as approved by BLM. The proposed measures should reduce the potential for noxious weeds to spread as a result of the Proposed Action. All disturbed surfaces shall be promptly revegetated with certified weed-free seed. All topsoil stockpiles shall be promptly re-vegetated to maintain soil microbe health and prevent weeds (Encana 2011c).

Cumulative Effects: Cumulative effects of the Proposed Action would be similar to the No Action alternative, only slightly greater. The project may potentially increase noxious weed species and abundance in the Roan Creek and Kimball Creek drainages if an aggressive weed management plan is not implemented in the greater project area over the long term.

Protective/Mitigation Measures: All machinery shall be cleaned to remove noxious weed seed that may be present from prior project locations.

Operator's responsibility for noxious weed control shall be ongoing and shall continue even after final reclamation, until a minimum of one year has passed since either the last well was plugged and abandoned, or the termination of the ROW, as the case may be.

See also Soils Mitigation in Section 3.2.3.

3.3.2 Sensitive Species

The analysis of the sensitive species affected environment addresses the geographic location of the project and an analysis of species that would potentially be affected. During the analysis, species and habitats which would be affected directly and indirectly by construction disturbance and associated human caused activities were taken into consideration.

BLM sensitive species are identified internally through field offices and externally with agencies and organizations dealing with management and tracking species of special concern. Early identification of these sensitive species is important in management of vulnerable species to prevent any future federal listing. BLM policy is to reduce or eliminate threats affecting the status of sensitive species, or improve the conditions of the species' habitat on BLM-administered lands (BLM 2008a).

Information used to generate the sensitive species lists (Tables 3.3.2-1, 3.3.2-2 and 3.3.2-3, below) are based on species status, distribution, and ecology. BLM and Colorado Division of Wildlife (CDOW); personal professional knowledge of BLM, U.S. Fish and Wildlife Service (USFWS) and consultant biologists; various scientific studies and reports; and information contained in the U.S. Forest Service (USFS), USFWS, and other internet-based references. Species known to occur or which may occur in the project area are addressed in greater detail. Federally listed Threatened, Endangered and Candidate species are addressed in Section 3.3.3 of this document.

Sensitive species habitat suitability and occurrence was further refined based on field surveys conducted during 2011 (WWE 2011a) near and on the proposed pad location. Not all of the sensitive species addressed and evaluated for this EA occur regularly in Colorado, and some are present only as seasonal migrants. Of those known to occur in Colorado, only a portion are known or suspected to breed or occupy habitat within the vicinity of the proposed well pad. For Birds of Conservation Concern (BCC) (USFWS 2008a), WWE biologists conducted a thorough review of the literature (Andrews and Righter 1992, Kingery 1998), and compiled a list of species likely to nest in or around the project area. Bird identification and taxonomic nomenclature are in accordance with that applied by the Colorado Breeding Bird Atlas Project (Kingery 1998).

Sensitive Plant Species

Current Conditions: The determination of the presence/absence of suitable habitat for sensitive plant species was based on previous WWE observations of typical habitat occupied by BLM sensitive plants, the Colorado Natural Heritage Plan (CNHP) Rare Plant Field Guide (Spackman et al. 1997), and locations of species documented by WWE biologists throughout western Colorado (WWE 2011b).

Sensitive species of plants that may be present in the project area, and their habitats, are listed in Table 3.3.2-1. A survey of potential sensitive plant habitat was conducted on June 28, 2011. There are no white shale outcrops of the Green River Formation present at the proposed well pad

site and access road to support sensitive species of plants that are known to occur on this formation.

Table 3.3.2-1: BLM Sensitive Species of Plants with Potential to Occur within Project Area

Species Scientific Name	Species Common Name	Habitat Description
<i>Astragalus debequaeus</i>	Debeque milkvetch	Varicolored, fine textured, seleniferous, saline soils of the Wasatch formation-Atwell Gulch member. Elevation: 5,100-6,400 feet
<i>Astragalus naturitensis</i>	Naturita milkvetch	Sandstone mesas, ledges, crevices and slopes in pinyon-juniper woodlands. Elevation: 5,000-7,000 feet

No BLM sensitive species of plants including the Debeque milkvetch and Naturita milkvetch are present within 100 meters of the well pad location (WWE 2011a). The soil characteristics and elevations present at the proposed well pad site and access road could potentially support the species listed in Table 3.3.2-1, but there are no known populations of these plants within several miles of the project area.

Sensitive Aquatic Wildlife Species

Current Conditions: Roan Creek and Kimball Creek are perennial streams within the project area vicinity. Kimball Creek, near the project area, does not support threatened, endangered, candidate, and BLM sensitive aquatic wildlife species. Roan Creek supports both threatened and sensitive cold water fish species. The proposed well pad would be located approximately 0.24 miles from Kimball Creek and approximately 1.3 miles upstream of Roan Creek. BLM sensitive aquatic species occurring in the project area are listed in Table 3.3.2-2. The Flannelmouth sucker (*Catostomus latipinnis*) or the Roundtail chub (*Gila robusta*) are not known to be present in the section of Kimball Creek near the proposed project (Elmblad 2011).

Table 3.3.2-2: BLM sensitive aquatic species, habitat description and potential occurrence

Species Common Name	Species Scientific Name	Status	Habitat Description	Habitat Potentially Occurring Within Landscape Area
Bluehead sucker	<i>Catostomus discobolus</i>	Sensitive Species	Colorado River Basin Drainage: Variety of habitat, headwater streams to large rivers.	Yes
Colorado River cutthroat trout	<i>Oncorhynchus clarki pleuriticus</i>	Sensitive Species	Headwater streams and lakes.	Yes

Bluehead Sucker: *Catostomus discobolus* is indigenous to the upper Colorado River Basin. Small and mid-sized tributaries are preferred, although areas of suitable habitat in larger low elevation streams are sometimes occupied (Ptacek et al. 2005). The species has been found in Roan Creek approximately 0.1 miles upstream of the confluence with Kimball Creek (Elmblad

2011). Bluehead sucker was not found within Kimball Creek during fish sampling conducted in the summer of 2010 (Elmblad 2011).

Anthropogenic activities comprise the primary threats to bluehead sucker. Construction of reservoirs and diversion dams cause change in stream flow regimes and fragmentation of habitat. Development of riparian areas may reduce the ability of stream ecosystems to function properly. Introduction of non-native fish species increases competition with bluehead sucker and may increase predation (Ptacek et al. 2005).

Colorado River Cutthroat Trout: Colorado River cutthroat trout (*Oncorhynchus clarki pleuriticus*) (CRCT) once occupied a large portion of the upper Colorado River basin, but current distribution of the species is limited to approximately 14 percent of that historical range (CRCT Coordination Team 2006). A conservation population of CRCT is present in Left Fork Carr Creek, a tributary of Carr Creek which flows into Roan Creek upstream of the project area. Roan Creek and all of its tributaries, from the headwaters to the confluence with Brush Creek, is CDOW designated Critical Cutthroat Trout Habitat (COGCC 2010). Runoff from the proposed well pad would eventually drain into Roan Creek downstream of a constructed fish barrier. The section of Roan Creek above the fish barrier contains a managed population of greenback (GB) lineage cutthroat trout. This population is managed as the federally-listed threatened greenback cutthroat trout and is discussed in Section 3.3.3.

Sensitive Terrestrial Wildlife

Current Conditions: A review of the habitat in the project area found that suitable habitat exists for several Sensitive terrestrial wildlife species. The presence or absence of many species is difficult to verify due to secretive behavior and the nocturnal nature of the species or the topography of the project area. Table 3.3.2-3 identifies Sensitive species designated in the Grand Junction Resource Area, as well as well as Southern Rockies/Colorado Plateau BCC species which may occur within and/or near the project area.

Table 3.3.2-3: Status of BLM Sensitive Species (BLMSS) and Birds of Conservation Concern (BCC) that may occur within project area

Species Common Name	Species Scientific Name	Status	Habitat Description	Habitat Potentially Occurring Within Landscape Area
MAMMALS				
Townsend’s big-eared bat	<i>Corynorhinus townsendii pallescens</i>	BLMS	Semi-desert shrublands, pinyon-juniper woodlands, and open montane forests associated with caves or crevices in rock faces. Elevations up to 9,500 ft.	Habitat- Yes Species - May forage and roost within the pinyon/juniper woodlands within project area
White-tailed Prairie Dog	<i>Cynomys leucurus</i>	BLMS	Occurs in open semi-desert shrublands, agricultural lands, pasturelands at low elevations.	Habitat-Yes Species- May occur in project area vicinity.

Table 3.3.2-3: Status of BLM Sensitive Species (BLMSS) and Birds of Conservation Concern (BCC) that may occur within project area

Species Common Name	Species Scientific Name	Status	Habitat Description	Habitat Potentially Occurring Within Landscape Area
Spotted bat	<i>Euderma maculatum</i>	BLMS	Rocky cliffs, caves, crevices, or mines near coniferous woodlands or open semi-desert shrublands accessible to water. Elevation ranges from sea-level to 10,600 ft. Known to occur in Garfield County.	Habitat- Yes Species- May forage or roost within the pinyon/juniper woodlands within the project area
Fringed myotis	<i>Myotis thysanodes</i>	BLMS	Roosts in caves or mines near ponderosa pine forests, oak brush, greasewood, or saltbush shrublands. Feeds on insects. Elevation up to 7,500 ft.	Habitat- Yes Species- May forage and roost near project area
Big free-tailed bat	<i>Nyctinomops macrotis</i>	BLMS	Roosts in crevices on cliff faces near pinyon/juniper woodlands, grasslands or shrublands. Inhabits lower elevations.	Habitat-Yes Species- May forage and roost near project area
BIRDS				
Golden Eagle	<i>Aquila chrysaetos</i>	BCC	Grasslands, shrublands, agricultural areas, piñon-juniper woodlands, and ponderosa forests. Prefers nest sites on cliffs and sometimes in trees in rugged areas.	Habitat- Above project location along cliffs on Kimball Mountain Species-May forage and hunt near project area
Burrowing Owl	<i>Athene cunicularia</i>	BCC, BLMS	Nests in burrows made by prairie dogs, rock squirrels, Wyoming ground squirrel, or other ground squirrels in sparsely vegetated habitat.	Habitat-Potential Species- Nesting is unlikely due to the lack of prairie dog and other ground squirrel burrows
Juniper Titmouse	<i>Baeolophus griseus</i>	BCC	Inhabits pinyon/juniper woodlands.	Habitat- Yes Species- nesting is likely in woodlands
Cassin's Finch	<i>Carpodacus cassinii</i>	BCC	Nests in ponderosa pine, Douglas-firs, and conifer forests. May occur in pinyon/juniper forests.	Habitat-Potential Species- Not observed in the pinyon/juniper woodlands of the project area
Prairie Falcon	<i>Falco mexicanus</i>	BCC	Nest on cliffs near open habitats such as grasslands and shrublands. Year-round resident of Colorado. Elevation generally below 10,000 feet, but occasionally above timberline.	Habitat- Above project location along cliffs on Kimball Mountain Species-May forage and hunt near project area

Table 3.3.2-3: Status of BLM Sensitive Species (BLMSS) and Birds of Conservation Concern (BCC) that may occur within project area

Species Common Name	Species Scientific Name	Status	Habitat Description	Habitat Potentially Occurring Within Landscape Area
American Peregrine Falcon	<i>Falco peregrines anatum</i>	BCC, BLMS	Nests on cliff ledges in mountains and foothills near pinyon-juniper woodlands, spruce/fir, and ponderosa woodlands.	Habitat- Above project location along cliffs on Kimball Mtn. Species- May forage and hunt near project area
Pinyon Jay	<i>Gymnorhinus cyanocephalus</i>	BCC	Nests communally, in mature pinyon-juniper woodlands. Nest early, young usually fledge by June 1.	Habitat - Yes Species – nesting is likely in pinyon-juniper woodlands
Bald Eagle	<i>Haliaeetus leucocephalus</i>	BLMS, BCC	Nests in mature cottonwoods or large pines usually near large rivers or other bodies of water.	Habitat- Winter range along Roan Creek, 1.3 miles from project Species- May forage near project area
Brewer's Sparrow	<i>Spizella breweri</i>	BCC, BLMS	Inhabits sagebrush dominated shrublands and typically are found in habitat that supports sage sparrows.	Habitat - Yes Species – singing males indicate nesting is occurring in sagebrush-greasewood habitat
Gray Vireo	<i>Vireo vicinior</i>	BCC	Occurs in lightly forested mesas, steep hillsides, and wide valleys where scattered juniper trees grow (Kingery 1998). Possible breeder in Garfield County.	Habitat- Yes Species-Not observed during field surveys
Greater Sage-Grouse	<i>Centrocercus minimus</i>	BLMS, Candidate	Historic nesting & brood-rearing habitat. Mapped as winter range along Kimball Creek	Habitat – yes – Possible winter range. Species- Not observed during surveys.
REPTILES				
Midget faded rattlesnake	<i>Crotalus viridis concolor</i>	BLMS	Pinyon-juniper woodlands, sagebrush steppe, rocky canyons and outcrops	Habitat – Yes Species – Not observed during survey
Milk snake	<i>Lampropeltis triangulum taylori</i>	Sensitive Species	Shrublands, canyons, pinyon-juniper woodlands and ponderosa/Gambel oak communities.	Habitat - Yes Species – Not observed during field surveys
AMPHIBIANS				
Great Basin spadefoot	<i>Spea intermontana</i>	BLMS	In Colorado, Great Basin spadefoot are found in pinyon-juniper woodlands, sagebrush, and semi-desert shrublands where they utilize permanent and temporary water sources for breeding.	Habitat – Yes Species – Not observed during survey

Table 3.3.2-3: Status of BLM Sensitive Species (BLMSS) and Birds of Conservation Concern (BCC) that may occur within project area

Species Common Name	Species Scientific Name	Status	Habitat Description	Habitat Potentially Occurring Within Landscape Area
Northern leopard frog	<i>Rana pipiens</i>	BLMS	Wet meadows and banks near shallow areas of ponds, marshes, lakes, streams, reservoirs, and ditches. Known to occur in Garfield County.	Habitat-Yes, along Kimball Creek Species-Unlikely to occur at proposed pad location

Mammals

Townsend’s Big-eared Bat: Very narrow roosting requirements limits the distribution of this species. The species is quite intolerant of disturbance at roost sites, and this may be the primary threat to the species (Gruber and Keinath 2006). Townsend’s big-eared bats have been documented in Garfield County (CDOW 2011) and suitable roost sites may occur in shale cliffs above the project area along Kimball Mountain.

Spotted Bat: The spotted bat has been found in a variety of habitats, including ponderosa pine, pinyon-juniper woodland and shrub desert. Spotted bats are found in many western States; however, its distribution is dependent upon large, isolated cliffs for roosting (Luce and Keinath 2007). Known predators include kestrels and owls (Luce and Keinath 2007). This species may be found in the major canyons along the western border of the state and southeastern Colorado; potential breeding habitat occurs along the cliffs of Kimball Mountain above the project area. Potential foraging habitat occurs at the proposed pad site and surrounding area.

Fringed Myotis: Records of occurrence are few, and the species is not common in the state. It occupies a variety of desert, grassland, and woodland habitats throughout western North America from British Columbia to southern Mexico (Keinath 2004). Crevices in shale cliffs and Douglas-fir in medium stages of decay provide suitable roosting sites in the area. Fringed myotis occur within Garfield County (CDOW 2011) and suitable foraging habitat is available throughout the project area.

Big Free-tailed Bat: A few scattered records of occurrence in Colorado suggest that big free-tailed bat is uncommon in the state. This species is found in pinyon-juniper woodlands, desert shrublands, and grasslands, and recent documentation of lactating females in the State suggests a breeding population exists (Armstrong et al. 1994). Shale cliffs on Kimball Mountain provide suitable roost sites. The species has been documented in Mesa County (Fitzgerald et al. 2011) and likely occurs in Garfield County (CDOW 2011).

White-tailed Prairie Dog: This species has the potential to occur in the pasturelands that surround the project area. The Kimball Creek valley is mapped by CDOW as overall range for white-tailed prairie dog (CDOW 2011). However, this area is not mapped for prairie dog colonies nor were they observed during field surveys (WWE 2011a and CDOW 2011).

Birds

Golden Eagle: This species is listed by the USFWS as a BCC, and is a common nester in sheer cliff habitat in the Roan Creek drainage and throughout the Roan Plateau region. No suitable nesting habitat exists within 0.5 mile of the project area. Foraging habitat is present within the project area.

Bald Eagle: This species is listed by USFWS as a BCC and by BLM as a sensitive species. Bald Eagle winter range is mapped by CDOW along Roan Creek, approximately 1.3 miles downstream of the project area (CDOW 2011). There is no suitable nesting habitat within 0.5 miles of the pad location and access road. Foraging habitat may be present in the project area.

Burrowing Owl: This species nests in burrows made by prairie dogs and other ground squirrels (Kingery 1998). Burrowing Owl and/or their sign (pellets, feathers, etc.) were not observed during field surveys and there are no prairie dog colonies within the project vicinity to provide suitable nesting habitat.

Juniper titmouse: This small, gray with a crest passerine bird is listed by the USFWS as a BCC, and is a year round resident of pinyon-juniper woodland habitat. It nests in natural cavities in junipers, beginning nest construction in April or early May (Kingery 1998). The species is somewhat common in suitable habitat in western Colorado. Suitable habitat exists on public land within the project area.

Cassin's Finch: This species is known to breed and inhabit the Douglas-fir, pinyon/juniper, and spruce/fir forests of Garfield County (Kingery 1998). There is potential for this species to occur in the pinyon/juniper trees scattered throughout the hills surrounding the project area.

Prairie Falcon and American Peregrine Falcon: Habitat requirements and breeding phenology of these two BCC-listed species are very similar. Both nest on sheer cliffs near suitable foraging habitat, with peregrine falcon often preferring more substantial cliffs with a commanding view of the surrounding area. Prairie falcons are often found near more open habitats such as grasslands and shrublands, while peregrines may associate with pinyon-juniper woodlands, spruce-fir forests or riparian areas. Vegetation association is less important than the availability of suitable nest substrate and prey base, although peregrines may forage up to 26 miles from the eyrie. In Colorado, peregrines return to nesting territories and begin courtship in late March, with prairie falcons often arriving slightly earlier (Steenhof 1998, CDOW 2004).

Although no active eyries are known near the project area, there is potential for falcons to forage and hunt within the project area.

Pinyon Jay: Pinyon-juniper woodlands are the preferred habitat for this species, which is listed by the USFWS as a BCC. They nest in colonies in pinyon/juniper and are confirmed breeders in Garfield County near the project area. Pinyon jays are an exception to typical nesting periods in this area and are known as an early nester. Records show nests with eggs as early as March 23 (Kingery 1998). Often young birds have fledged by mid-May each year.

Brewer's Sparrow: This species is listed as a BLM Sensitive species and a BCC. Brewer's sparrow is considered a sagebrush obligate species, and prefers big sagebrush species. Other shrub species that form similar stand characteristics, such as greasewood, hopsage, and

saltbushes may also attract nesting Brewer's sparrows. The Colorado Breeding Bird Atlas (Kingery 1998) lists the species as possibly breeding in the project area.

Gray Vireo: This species has potential to occur in the area surrounding the proposed well pad and access road; however, it has not been confirmed as breeding in Garfield County (Kingery 1998). Gray Vireo nests in lightly forested mesas, steep hillsides, canyons, and wide valleys where scattered juniper trees grow spaced apart (Kingery 1998). This habitat is very similar to the habitat present surrounding the project area.

Reptiles

Midget Faded Rattlesnake: Midget faded rattlesnake may occur in the project area. Habitat includes dry uplands dominated by pinyon-juniper/sagebrush communities. Rocky outcrops providing thermal cover, escape cover, and hibernacula are a critical component of suitable habitat, (Travsky and Beauvais 2004). In many areas, it is difficult to determine where the subspecies *viridis* (western rattlesnake) and *concolor* (midget faded rattlesnake) begin and end (Hammerson 1999) and intergrades of the two subspecies add to the taxonomic confusion. The nearest CNHP records are west of DeBeque and in lower Parachute Creek a few miles north of Parachute. WWE biologists identified an adult of the species in 2010 in Smith Gulch, north of Interstate 70 between DeBeque and Parachute, an adult was also observed by a WWE biologist in 2009 in Dry Fork south of the project area, and another adult was reported anecdotally to WWE biologists in 2010 from Clear Creek.

Milk snake: The milk snake occurs throughout Colorado, and may have the largest distribution of any snake species worldwide (Hammerson 1999). Habitats in western Colorado include pinyon/juniper woodlands, shrubby hillsides, and arid river bottoms. Although notoriously hard to detect, milk snake has been documented in Mesa and Garfield Counties along the Colorado River corridor. Suitable habitat for this species exists in the project area.

Amphibians

Great Basin Spadefoot: Western Colorado comprises the eastern boundary of this species' range. Great Basin spadefoot spends most of the year in xeric upland habitat with loose, sandy soil for burrowing to escape adverse climate conditions. Vegetation association is broad, and includes pinyon-juniper woodlands, ponderosa pine forests, sage-steppe shrublands and Douglas-fir forests. Breeding habitat is quite varied, and includes rain pools, irrigation ditches, ponds, permanent and ephemeral streams, and flooded fields (Buseck et al. 2005). Suitable breeding and general habitat is available along Kimball Creek and in the uplands above the creek. The nearest record for Great Basin spadefoot is approximately 15 miles southwest of the project, in Hunter Canyon. There is the potential for Great Basin spadefoot to occur in dry channels present near the project area during spring runoff when water ponds in channels creating potential breeding habitat (WWE 2011a).

Northern Leopard Frog: This species is found in wet areas and meadows along marshes, lakes, streams, reservoirs, ponds, and irrigation ditches (Hammerson 1999). Leopard frogs are typically found near the water's edge. It is unlikely that this species would occur at the proposed well pad and or the access road due to the distance of the project from water sources. The nearest suitable habitat is located approximately 0.24 miles south of the pad along the banks of Kimball Creek.

Current conditions of the Public Land Health Standard for Special status, Threatened and Endangered Species: No LHA has been completed for BLM lands within the project area. Anecdotal observations suggest that the Public Land Health Standard for special status, threatened and endangered species is currently being met. The landscape in the project area is naturally fragmented by valleys, cliffs and ridgetops as well as fragmented by agricultural activities in the valley bottom, such as hay meadows, clearing of sage, and roads of various levels. The surrounding landscape exhibits a diversity of plant and animal species within several vegetation communities. The adjacent riparian system remains intact and functional. Suitable habitat for protected plant species is present and undisturbed. Noxious weeds are becoming an issue in previously disturbed areas, but are not yet proliferating throughout the plant communities.

No Action

Direct and Indirect Effects: Under the No Action alternative, the proposed well pad would not be constructed; therefore, no disturbance would occur in potential habitat for sensitive plant, aquatic or terrestrial species, and existing populations would not be impacted.

Cumulative Effects: Future development of natural resources in the project area and throughout the region, particularly natural gas and oil shale, comprise the primary potential impacts to sensitive species and their habitat for the foreseeable future. Construction of infrastructure such as pipelines, roads and well pads in sensitive plant habitats may permanently alter the characteristics of the habitat, making it unsuitable for sensitive species. A large percentage of unique or limited plant habitats in the area, such as barren shale slopes of the Green River Formation below Kimball Mountain are privately owned and, therefore, not protected by federal guidelines.

The No Action alternative would not increase anthropogenic impacts to important plant, aquatic and terrestrial habitats, or the sensitive species found within them, beyond what would otherwise occur.

-Finding on Public Land Health Standards for Sensitive and Endangered Species: Under the No Action Alternative, current land health status would remain the same.

Proposed Action

Direct and Indirect Effects: No sensitive plant species were observed in potential habitat near the proposed pad location, thus no known populations would be affected. Construction of the well pad and access road would cause minimal disturbance to habitat, and would likely not preclude establishment of species in the future.

The proposed well pad would have no direct effect on aquatic habitat. The pad would be located in a sagebrush dominated valley north of Kimball Creek and approximately 1.5 miles west of Roan Creek. Construction of the well pad has the potential to increase sediment and the runoff of contaminants into Kimball Creek and Roan Creek; however, with the application of mitigating measures, as described in the Roan Creek SWMP and Encana's Oil Spill Contingency Plan (Encana 2009, 2011c), the expected small amount of sediment increase anticipated from this project is unlikely to result in any detectable impact on aquatic habitat (see the *Aquatic Wildlife* section of this document for additional details on aquatic habitat).

Effects of the proposed well pad on sensitive terrestrial species would be limited primarily to temporary disturbance during construction activities. Approximately 6.4 acres of sagebrush shrublands intermixed with grasslands would be removed as a result of this project until interim reclamation is complete on the well pad. Once interim reclamation has been completed approximately 1.7 acres would remain un-vegetated for the life of the wells. The sagebrush shrublands that would be removed as a result of this project provide nesting and foraging habitat for Brewer's Sparrows and foraging and roosting habitat for sensitive species of bats. Historically sage in the area was confined to the valley bottom outside of the floodplain and to ridgetops between drainages. Much of the sage in the valley bottom near the proposed action has been thinned, reduced, eliminated or otherwise altered by agricultural activities. Remaining sage is generally in small, fragmented patches.

The proposed well pad would be located within 100 meters of CR 202. Studies have shown that birds tend to avoid nesting within 500 to 600 meters of rural roads (FHWA 2011). Research also shows that along rural dirt roads densities of Brewer's Sparrows are reduced by 39 percent to 60 percent (Ingelfinger and Anderson 2004). Because birds tend to avoid nesting near rural roads it is unlikely that the proposed project would have a measurable impact on nesting migratory and sensitive bird species present in the project area.

The timing of construction would largely determine the extent of temporary disturbance related impacts on sensitive terrestrial species. Construction and drilling activities during the summer nesting season may impact active passerine nests and otherwise disturb adults to the point of nest abandonment. Nesting raptors within the project area would be particularly sensitive to activities at this time as well. Reptiles and amphibians would be most active in the summer, and would be more likely to be encountered.

Effects on bat species would be limited primarily to temporary disturbance near roost sites in the pinyon-juniper woodlands near the Proposed Action. However, the disturbance should be limited to times of temporary construction and drilling noise.

Cumulative Effects: Cumulative effects of the Proposed Action would be similar to the No Action alternative, only slightly greater. The proximity of the proposed pad to a well-used county road greatly limits the additive effect of impacts from construction activities.

Finding on Public Land Health Standards for Sensitive and Endangered Species: The Proposed Action would not alter the current land health status at a landscape scale.

Protective/Mitigation Measures: See section 3.3.6 for timing stipulations to protect nesting raptors, migratory birds and BCC species.

3.3.3 Threatened or Endangered Species (includes a finding on Standard 4)

The analysis of affected environment addresses the geographic location of the project and an analysis of species that potentially would be affected. During the analysis, species and habitats which have the potential to be affected directly or indirectly by construction disturbance and associated human caused activities were taken into consideration.

Information used to generate the potentially affected Threatened, Endangered (T&E) and Candidate species list is based on species status, distribution, and ecology (Table 3.3.3-1). It was derived from USFWS recovery plans, CDOW habitat/vegetation mapping, personal knowledge

of CDOW, USFS and BLM present and former biologists, USFWS biologists, various scientific studies and reports, and information contained in the Grand Junction BLM RMP. Internet resources were consulted and pertinent information employed to develop the analysis.

Table 3.3.3-1: Threatened and Endangered Species with Potential to Occur

Common Name ¹	Scientific Name	Status ²	Occurrence	Habitat suitability
Parachute penstemon	<i>Penstemon debilis</i>	T	Not confirmed	Potential habitat is present above the project area along the shale cliffs of Kimball Mtn.
Colorado hookless cactus	<i>Sclerocactus glaucus</i>	T	Not confirmed	No occupied habitat present at proposed project location.
De Beque phacelia	<i>Phacelia submutica</i>	T	Not confirmed	No occupied habitat present at proposed project location.
Greater Sage-Grouse	<i>Centrocercus minimus</i>	C	Historic nesting & brood-rearing habitat. Mapped as winter range along Kimball Creek	Habitat – yes – Possible winter range. Species- Not observed during surveys.
Razorback sucker ¹	<i>Xyraunchen texanus</i>	E	Not present, offsite impacts possible	No potential habitat in Roan Creek watershed ¹
Colorado pikeminnow ¹	<i>Ptychocheilus lucius</i>	E	Not present, offsite impacts possible	No potential habitat in Roan Creek watershed. ¹
Humpback chub ¹	<i>Gila cypha</i>	E	Not present, offsite impacts possible	No potential habitat in Roan Creek watershed. ¹
Bonytail ¹	<i>Gila elegans</i>	E	Not present, offsite impacts possible	No potential habitat in Roan Creek watershed. ¹
Greenback cutthroat trout	<i>Oncorhynchus clarki stomias</i>	T	Confirmed in Roan Creek	Occupied habitat present nearby in Roan Creek upstream of the confluence of Kimball Creek and Roan Creek. No habitat present for this species in Kimball Creek and/or Roan Creek at the confluence.

¹Water depletions in the Upper Colorado River system may affect these species or their designated critical habitat located downstream in the Green and Colorado Rivers.

²Status: T = Threatened, E = Endangered, C = Candidate, P = Proposed

T&E Plant Species

Current Conditions: The determination of the presence/absence of suitable habitat for T&E plant species was based on previous WWE observations of typical habitat occupied by T&E species, the CNHP Rare Plant Field Guide (Spackman et al. 1997), USFWS recovery plans, and locations of species documented by WWE biologists in western Colorado (WWE 2011b). A biological survey was conducted on June 28, 2011. No T&E species were observed within a

100-meter survey buffer from the proposed disturbance of the well pad. There are also no barren shale exposures of the Green River Formation which is considered potential habitat for the federally listed threatened Parachute penstemon (*Penstemon debilis*). The nearest potential habitat as mapped by USFWS is approximately 1,000 meters northwest of the proposed pad along the rim of Kimball Mtn. (USFWS 2011).

Colorado Hookless Cactus (SCGL3): *Sclerocactus glaucus* is associated with the desert shrub community containing such species as shadscale (*Atriplex confertifolia*), galleta (*Hilaria jamesii*), Indian ricegrass (*Oryzopsis hymenoides*), hedgehog cactus (*Echinocereus triglochidiatus*), dropseed (*Sporobolus cryptandrus*), prickly-pear cactus (*Opuntia polyacantha*), yucca (*Yucca harrimaniae*), and snakeweed (*Gutierrezia sarothae*). Populations of this species are associated with pinyon-juniper woodlands in Colorado (USFWS 2010a).

Colorado hookless cactus is known to occur in lower Roan Creek drainage north of De Beque. The nearest occurrence is approximately 4.8 miles southeast of the project area, and was not found on the pad location, or in the surrounding habitats, during field surveys by WWE biologists (WWE 2011b). No critical habitat rules have been published for the Colorado hookless cactus (USFWS 2010b).

De Beque Phacelia (PHSCS3): This species is endemic to the De Beque/Lower Roan Creek/Horsethief Canyon area in the lower Colorado River Valley in Colorado and was listed by the USFWS as a candidate species in 1990. On July 27, 2011, the USFWS published in the Federal Register listing De Beque phacelia as threatened under the Federal Endangered Species Act (ESA) throughout its range (USFWS 2011) becoming effective on August 26, 2011.

De Beque Phacelia is associated with the desert shrub community containing such species as Rocky Mountain thistle (*Cirsium perplexans*), Wyoming sagebrush, (*Artemisia tridentata* subsp. *wyomingensis*), shadscale, galleta, Indian rice grass, hedgehog cactus, prickly-pear cactus, yucca and snakeweed. Populations of this species are associated with pinyon-juniper woodlands in Colorado. Maximum known elevation is 6,200 ft. (Spackman et al. 1997).

Seeds usually germinate in early April (Burt and Spackman 1995) and plants flower from late April through late June (O’Kane 1987). Fruit set is from mid-May through late June. Individuals finish their life cycle by late June to early July, after which time they dry up and blow away. The species grows in a habitat with wide temperature fluctuations, long drought periods and erosive saline soils. Upon drying, the soils form deep cracks. Seeds are believed to plant themselves by falling into the cracks that close when wetted, thus, covering the seeds (O’Kane 1987). Seed dormancy may be controlled by moisture, temperature and light. A persistent seed bank seems to be a requirement for continued survival of this species (Ladyman 2003).

De Beque phacelia is restricted to exposures of dark gray and brown clay soils derived from the Atwell Gulch and Shire members of the Wasatch Formation (O’Kane 1987). These expansive clay soils are found on moderately steep slopes, benches and ridge tops adjacent to valley floors in the occupied habitat. Soil outcrops where De Beque phacelia is found are typically barren or semi-barren of other plant species. No such habitat occurs in the project area. The project area has been mapped by USFWS as potential habitat for Debeque phacelia (USFWS 2011). However, the nearest known occurrence of De Beque phacelia is in lower Roan Creek,

approximately 5.2 miles southeast of proposed pad and suitable habitat for this species was not present at the pad location and proposed access road (WWE 2011a, 2011b).

T&E Aquatic Species

Current Conditions: Due to the lack of suitable habitat, none of the above federally- or State-listed aquatic wildlife species are known to breed in the project area, or utilize the area for other crucial life functions. However, four federally endangered fish species, Colorado pikeminnow (*Ptychocheilus lucius*), razorback sucker (*Xyraunchen texanus*), humpback chub (*Gila cypha*), and bonytail (*Gila elegans*) and their designated Critical Habitats (USFWS 1994, BLM 2008b) located downstream of the project on the Colorado River could be impacted by offsite effects resulting from project related water use (USFWS 2008b). The main factor identified as potentially affecting these fishes is the consumptive use of water from the Colorado River or its tributaries, resulting in decreased flows and adverse modification of critical habitat.

The GB lineage cutthroat trout, which are managed as the federally-listed threatened greenback cutthroat trout (*Onchorhynchus clarki stomias*), occupies Roan Creek above Brush Creek approximately 5.3 miles upstream of the Kimball Creek/Roan Creek confluence. Roan Creek and all of its tributaries above the confluence with Brush Creek are designated Critical Cutthroat Trout Habitat (COGCC 2010). No federal critical habitat rules have been published for GB cutthroat trout (USFWS 2010c).

T&E and Candidate Bird Species

Current Conditions: Kimball Creek Valley is mapped as historic Greater Sage-grouse range by the Colorado Parks and Wildlife (CDOW 2011). There is potential for Sage-grouse to use this area during the winter (Toolen 2012). However, it is unlikely that Sage-grouse would use this area for breeding. Sage-grouse require tall mature sagebrush near the lek site (breeding site) for day use and they also require large continuous stands of sagebrush with the presence of tall grasses (Kingery 1998). Overgrazing, the conversion of sagebrush shrublands to agriculture and habitat fragmentation have greatly reduced Sage-grouse numbers (Kingery 1998).

T&E Mammals

Due to the lack of suitable habitat, there are no federally or State-listed mammal species that are known to breed in the project area, or utilize the area for other crucial life functions.

Current conditions of the Public Land Health Standard for Threatened and Endangered Species: No LHA has been completed for BLM lands within the project area. Anecdotal observations suggest that the Public Land Health Standard for special status, threatened and endangered species is currently being met. The landscape in the project area is naturally fragmented by valleys, cliffs and ridge tops as well as fragmented by agricultural activities in the valley bottom, such as hay meadows, clearing of sage, and roads of various levels. The surrounding landscape exhibits a diversity of plant and animal species within several vegetation communities. The adjacent riparian system remains intact and functional. Suitable habitat for protected plant species is present and undisturbed. Noxious weeds are becoming an issue in previously disturbed areas, but are not yet proliferating throughout the plant communities.

No Action

Direct and Indirect Effects: Under the No Action alternative, the well pad would not be constructed; therefore, no disturbance would occur in potential habitat for threatened, endangered or candidate plant, aquatic or terrestrial species, and existing populations would not be impacted.

Cumulative Effects: Activities that disturb and compact soils may increase runoff into sensitive aquatic habitats. Increased sediment loads entering Kimball Creek and eventually Roan Creek may reduce the viability of habitat for spawning (Magee and McMahon 1996) and for survival and growth of juvenile fish (Kenwyn et al. 2004). Much of the riparian area along Kimball and Roan Creeks are in private ownership and is, therefore, more vulnerable to development. Activities that strip riparian vegetation, increase erosion and runoff, channelize the stream, lower the water table, change the stream flow regime, or introduce non-native plant species may prevent riparian systems from functioning properly (Ekness and Randhir 2007).

Future development of oil and gas, pipelines, and the conversion of shrublands to agricultural lands would continue to fragment and remove sagebrush shrublands along Kimball Creek which may provide winter range for Greater Sage-grouse.

Finding on the Public Land Health Standard for Threatened and Endangered Species: The No Action alternative is not expected to affect populations or habitats of T&E species and, as such, should have no influence on the status of applicable Land Health Standards.

Proposed Action

Direct and Indirect Effects: The Proposed Action would not directly impact any T&E species and/or their designated critical habitats.

During biological surveys for the proposed action Sage-grouse sign (fecal pellets, cecal droppings, feathers, etc.) was not observed within the project boundaries (WWE 2011a). A small portion (6.4 acres) of potential winter range for Greater Sage-grouse would be removed as a result of this project. Winter range in Colorado varies according to severity of the winter (i.e., wind, snowfall, etc.). Sage-grouse may travel short distances or many miles between seasons (Colorado Greater Sage-grouse Conservation Plan 2008). During the winter months Sage-grouse prefer habitat typically composed of sagebrush greater than 12 inches tall with a canopy cover greater than 25 percent (Colorado Greater Sage-grouse Conservation Plan 2008). The current lease stipulation for Big Game from December 1 through May 1, will serve to protect winter Greater Sage-grouse activities. No further mitigation is needed. In order to continue protective measures for Greater Sage-grouse, waivers to this stipulation will not likely be approved.

Impacts on Endangered Colorado River fish: A Recovery Implementation Program for Endangered Fish Species in the Upper Colorado River Basin was initiated in January 1988. The Recovery Program serves as the reasonable and prudent alternative to avoid jeopardy and provide recovery to the endangered fishes by depletions from the Colorado River Basin. In 1993, the FWS developed an additional Section 7 agreement and the Recovery Action Plan (Plan) which addresses Section 7 consultation on depletion impacts. The Plan established a framework for conducting all future Section 7 consultations on depletion impacts related to new projects and those associated with historic projects in the Upper Basin. In accordance with the

Plan framework, BLM prepared a Programmatic Biological Assessment (PBA) in May 1994 which addressed water depletions for BLM permitted actions in the upper Colorado River Basin. In May of 2008, BLM prepared an updated PBA that addressed water depleting activities associated with BLM's fluid minerals program in the Colorado River Basin within Colorado. Water depletions associated with fluid mineral development and analyzed in the PBA include water for well drilling and completion, hydrostatic testing of pipelines, and dust abatement. On December 19, 2008, in response to BLM's PBA, the USFWS issued a Programmatic Biological Opinion (PBO) (ES/GJ-6-CO-08-F-0006) (USFWS 2008b), which determined that BLM water depletions from the Colorado River Basin are not likely to jeopardize the continued existence of the Colorado pikeminnow, humpback chub, bonytail, or razorback sucker, and that BLM water depletions are not likely to destroy or adversely modify designated critical habitat.

The 2008 PBO includes a conservation measure which allows BLM to authorize oil and gas wells, and associated developments, which result in water depletion while minimizing the negative effects of the action, and facilitating further recovery of the endangered fishes. As a conservation measure in the PBO, USFWS authorized BLM to solicit a one-time contribution to the Recovery Implementation Program for Endangered Fish Species in the Upper Colorado River Basin. Thus, the FWS has determined that project depletion impacts can be offset by the water project proponent's one-time contribution to the Recovery Program in the amount determined by multiplying the total average annual depletion for each project by the depletion charge per acre-foot in effect at the time the payment is made.

Encana has a signed Recovery Agreement in place which entitles them to use the BLM's PBO for water depletions associated with fluid mineral development. Water consumption associated with the development and production of the well pad was analyzed as an integral component of natural gas development in BLM's PBA and, the water depletion fee associated with this action has been paid through the Western Energy Alliance (formerly IPAMS). As such, the 79.3 acre-feet of depletions attributable to the Proposed Action are covered by the Service's PBO.

With mitigation, no adverse impacts would occur in potential habitat for threatened, endangered or candidate plant, aquatic or terrestrial species and existing populations.

Cumulative Effects: Cumulative effects of the Proposed Action would be similar to the No Action alternative, only slightly greater.

- Finding on the Public Land Health Standard for Threatened and Endangered Species: The Proposed Action Alternative is not expected to affect populations or habitats of T&E species and, as such, should have no influence on the status of applicable Land Health Standards.

Protective/Mitigation Measures: Also see the *aquatic habitat, vegetation, water quality and soils* sections of this document for mitigation measures related to aquatic habitats.

See Section 3.3.5 Wildlife, for mitigation related to timing limitations for nesting raptors.

3.3.4 Vegetation (grasslands, forest management) (includes a finding on Standard 3)

Current Conditions: The project is located at an elevation of approximately 5,600 feet near Kimball Creek. The proposed well pad would be situated in a sagebrush flat south of terrain that rapidly rises to the north toward the east end of Kimball Mountain. The current vegetation

at the site consists primarily of big sagebrush (*Artemisia tridentata*), greasewood (*Sarcobatus vermiculatus*) and juniper (*Juniperus spp.*) with an understory of grasses including crested wheatgrass (*Agropyron cristatum*), Junegrass (*Koeleria macrantha*), and other wheatgrass and forb species. Common plant species present at the proposed pad site and access road are described in Table 3.3.4-1.

Table 3.3.4-1: Plant species occurring in the proposed well pad and access road location

Common Name	Scientific Name
Big sagebrush	<i>Artemisia tridentata</i>
Blue grass	<i>Poa spp.</i>
Bottlebrush squirreltail	<i>Elymus elymoides</i>
Colorado Four-o'clock	<i>Mirabilis multiflora</i>
Common sunflower	<i>Helianthus annuus</i>
Crested wheatgrass	<i>Agopyron cristatum</i>
Four-winged saltbush	<i>Atriplex canescens</i>
Galletagrass	<i>Hilaria jamesii</i>
Indian ricegrass	<i>Oryzopsis hymenoides</i>
Junegrass	<i>Koeleria macrantha</i>
Juniper	<i>Juniperus sp.</i>
Milkvetch	<i>Astragalus sp.</i>
Needle-and-thread	<i>Hesperostipa comatacomata</i>
Onion	<i>Allium sp.</i>
Penstemon	<i>Penstemon sp.</i>
Peppergrass	<i>Lepidium montanum</i>
Piñon pine	<i>Pinus edulis</i>
Prickly-pear cactus	<i>Opuntia spp.</i>
Rabbitbrush	<i>Chrysothamnus nauseosus</i>
Salsify	<i>Tragopogon sp.</i>
Scarlet Globemallow	<i>Sphaeralcea coccinea</i>
Shadscale	<i>Atriplex confertifolia</i>
Slender Wheatgrass	<i>Agropyron pauciflorum</i>
Snakeweed	<i>Gutierrezia sarothrae</i>
Tansy aster	<i>Machaeranthera spp.</i>
Utah sweetvetch	<i>Hedysarum boreale</i>
Wavyleaf thistle	<i>Cirsium tracyi</i>
Western wheatgrass	<i>Pascopyrum smithii</i>
Wyoming Indian paintbrush	<i>Castilleja linariifolia</i>

Cheatgrass (*Bromus tectorum*) is widespread throughout the project area. Field bindweed (*Convolvulus arvensis*) and jointed goatgrass (*Aegilops cylindrica*) are found along both sides of County Road 202.

Current conditions of the Public Land Health Standard for plant and animal communities (partial, see also Wildlife, Aquatic and Terrestrial): A LHA has not been completed for BLM lands in the project area. However, anecdotal observations suggest that

Standard 3 is currently being met over the majority of the project area. Noxious weeds are a concern in previously disturbed areas, along County Road 202, and on some private lands along Kimball Creek show signs of excessive grazing. Habitat fragmentation is relatively insignificant in the project area, although nearby areas are beginning to see the effects of natural gas development.

No Action

Direct and Indirect Effects: Under the No Action alternative, the APD would not be approved. The well pad would not be constructed; therefore vegetation communities in the project area would not be affected.

Cumulative Effects: Development on private lands and energy exploration on public and private lands have the potential to negatively affect vegetation communities in the project area. New natural gas exploration is expected to continue in the region for the foreseeable future. These activities would incrementally increase fragmentation of habitat and may potentially increase the prevalence of noxious weeds. These activities would continue to occur under the No Action Alternative.

Finding on the Public Land Health Standard for Plant and Animal Communities (partial, see also Wildlife, Aquatic and Terrestrial): The current land health standard would remain the same under the No Action Alternative.

Proposed Action

Direct and Indirect Effects: The Proposed Action would remove approximately 6.2 acres of vegetation for construction of the well pad and approximately 0.2 acres of vegetation for construction of the access road; therefore, a total of 6.4 acres of vegetation would be removed as a result of this project. After interim reclamation, which would take place within 6 months of completion activities, approximately 1.7 acres would remain un-vegetated for the life of the wells. Encana has committed to reseeded of the disturbed site using the seed mix stipulated by BLM, for both interim and final reclamation. Soils would be returned to the pad and road disturbance areas on a last-out first-in basis, and topsoil spread over the surface to provide suitable conditions for successful revegetation. Potential exists to introduce and spread existing noxious weed infestations in the area if a seed applied to the site contains any noxious weed seed.

Cumulative Effects: Cumulative effects of the Proposed Action would be similar to the No Action alternative, only slightly greater.

- Finding on the Public Land Health Standard for Plant and Animal Communities (partial, see also Wildlife, Aquatic and Terrestrial): The Proposed Action would remove a small portion of habitat for plant and animal communities for the life of the well pad; however, the nominal amount of habitat removed would not result in failure of the standard being met at a landscape scale.

Protective/Mitigation Measures: During interim reclamation, slopes would be re-contoured to minimize areas that exceed a 3:1 slope. Any areas exceeding the 3:1 slope criteria or with high walls shall be reclaimed using enhanced stabilization and erosion prevention methods.

Reclamation shall be considered successful when basal cover of seeded species or other naturally recruited native species is at least 80 percent of basal cover on adjacent or nearby undisturbed areas where vegetation is in a healthy condition. Reclamation efforts shall be monitored by Encana and additional reclamation efforts shall be required until this objective is met.

Table 3.3.4-2 shows the seed mix which must be certified as weed free in accordance with BLM requirements.

Table 3.3.4-2: BLM Recommended Seed Mix

Species	Seeding Rate for Broadcast Application ¹
GRASSES	
Slender wheatgrass (<i>Elymus trachycaulus ssp. trachycaulus</i>), San Luis	8
Needle and thread grass (<i>Hesperostipa comata ssp. comata</i>)	4
Western wheatgrass (<i>Pascopyrum smithii</i>), Rosana	6
Indian ricegrass (<i>Achnatherum hymenoides</i>), Rimrock	4
Thickspike wheatgrass (<i>Elymus lanceolatus</i>), Critana	8
Total	28
Shrubs/FORBS²	
Scarlet globemallow (<i>Sphaeralcea coccinea</i>)	1
Shadscale (<i>Atriplex confertifolia</i>)	4
Total²	5

¹ Seeding rate is in pounds of pure live seed per acre

² Seed at a later date to allow for broad leaf herbicide treatments to control annual weeds

3.3.5 Wildlife (includes fish, aquatic and terrestrial) (includes a finding on Standard 3)

Current Conditions: Diversity in vegetation communities and topography within the project area creates suitable habitat for an abundance of aquatic and terrestrial species. Plant communities are generally healthy Native Plant communities in the area, particularly in the valley bottom, have been altered by agricultural activities such as hay production and pasturing livestock. Noxious weeds are not yet overly abundant outside of previously disturbed areas. Although a LHA has not been completed for BLM lands in the project area, anecdotal observations suggest the Public Land Health Standard for plant and animal communities is being met.

Fish and Aquatic: Speckled dace (*Rhinichthys osculus*) were the only fish species collected from sampling in Kimball Creek during summer 2010 (Elmblad 2011). Other fish species occur downstream in Roan Creek include: mottled sculpin (*Cottus bairdii*), speckled dace (*Rhinichthys osculus*), brook trout (*Salvelinus fontinalis*), and brown trout (*Salmo trutta*) are also known to occur in Roan Creek.

Terrestrial: Many terrestrial species are likely to occur in the project area, including mountain lion, black bear, coyote, mule deer, elk, cottontail, jackrabbit, least chipmunk, deer mouse, woodrat, and gray fox. Elk and mule deer sign (i.e., tracks, pellets, antler sheds) were observed throughout the project area during biological inventories of the site (WWE 2011a).

The proposed well pad would lie within CDOW Game Management Unit (GMU) 31, and is within the overall ranges of mule deer and American elk, severe winter range and winter concentration areas for both mule deer and elk (CDOW 2011). The CDOW manages deer and elk herds by larger Data Analysis Units (DAU), which are generally comprised of two or more GMUs.

Mule deer DAU 41 includes GMUs 31 and 32. This herd is currently nearly 52 percent below the long term objective (LTO) of 16,500 animals, with an estimated population of 7,980 (CDOW 2010a).

The unit 31 elk herd is located in elk DAU 10, which also includes GMUs 21, 22, 30, 31 and 32. The current estimated elk population in DAU 10 is 11,870, which is 32 percent over the LTO of 9,000 animals (CDOW 2010b). Lower elevations of the project area are entirely within CDOW mapped elk severe winter range (CDOW 2011). Severe winter range includes that portion of the range where 90 percent of the individuals are located when the annual snowpack is at its maximum and/or temperatures are at a minimum in the two worst winters out of ten.

The small mammal species that are likely to occur in the project area, display broad ecological tolerance and are widely distributed throughout the region. No narrowly distributed or highly specialized species or sub-specific populations are known to inhabit this area.

Wild turkey is found extensively throughout the Roan Creek drainage. This species typically nests in Gambel oak and cottonwood/riparian habitats during April and May (Kingery 2008). The proposed well pad location and access road are situated within an area mapped as overall and winter range for wild turkey (CDOW 2011).

Potential raptor nesting habitat in the area includes scattered pinyon-juniper woodlands. Woodlands in the project area vicinity did not appear to provide suitable nesting habitat for raptors of the genus *Accipiter*. Sixteen species of raptors may potentially inhabit the project area (Table 3.3.5-1). BLM sensitive species and BCC are addressed in Section 3.3.2 of this EA.

Table 3.3.5-1: Raptors that May Potentially Inhabit the Project Area

Common Name	Scientific Name	BLM Sensitive/BCC
American Kestrel	<i>Falco sparverius</i>	No
American Peregrine Falcon	<i>Falco peregrinus anatum</i>	BLM, BCC
Cooper's Hawk	<i>Accipitier cooperi</i>	No
Flammulated Owl	<i>Otus flameolus</i>	BCC
Golden Eagle	<i>Aquila chrysaetos</i>	BCC
Great Horned Owl	<i>Bubo virginianus</i>	No
Long-eared Owl	<i>Asio otus</i>	No

Table 3.3.5-1: Raptors that May Potentially Inhabit the Project Area

Common Name	Scientific Name	BLM Sensitive/BCC
Northern Goshawk	<i>Accipiter gentilis</i>	BLM
Northern Harrier	<i>Circus cyaneus</i>	No
Northern Pygmy-Owl	<i>Glaucidium gnoma</i>	No
Northern Saw-Whet Owl	<i>Aegolius acadicus</i>	No
Prairie Falcon	<i>Falco mexicanus</i>	BCC
Red-tailed Hawk	<i>Buteo jamaicensis</i>	No
Sharp-shinned Hawk	<i>Accipiter striatus</i>	No
Swainson's Hawk	<i>Buteo swainsoni</i>	No
Western Screech-Owl	<i>Megascops kennicottii</i>	No

Raptor surveys were conducted on June 28, 2011, during the annual breeding, nesting, and brood rearing season for raptor species found in western Colorado. Nesting season in this area begins in late December or January for golden eagles, and continues into August for late-nesting species such as Cooper's hawk and sharp-shinned hawk.

No active raptor nests are located within 0.25 miles of the project area (WWE 2011a). Golden Eagle nests are known to occur along cliffs on the south side of Kimball Mountain approximately 1.2 miles from the project area.

Migratory passerine birds are likely abundant in the project area during the nesting season. Big sagebrush and upland shrubs found throughout the project area provide habitats for a variety of nesting passerines. The majority of nesting occurs between May 15 and July 15.

- *Current conditions of the Public Land Health Standard for Plant and Animal Communities (partial, see also Vegetation):* No LHA has been completed for BLM lands within the project area. Anecdotal observations suggest that the Public Land Health Standard for Standard 3 is currently being met. The landscape in the project area is still relatively unfragmented, and exhibits a diversity of plant and animal species within several vegetation communities. The riparian system remains intact and functional. Suitable habitat for protected plant species is present and undisturbed. Noxious weeds are becoming an issue in previously disturbed areas, but are not yet proliferating throughout the plant communities.

No Action

Direct and Indirect Effects: Under the No Action alternative, well pad would not be constructed; therefore, no disturbance to wildlife or important habitats would occur.

Cumulative Effects: Future development of natural resources in the project area and throughout the region, particularly natural gas and oil shale, comprise the primary potential impacts to wildlife species and their habitats for the foreseeable future. Construction of infrastructure such as pipelines, roads, and well pads in wildlife habitats may fragment and permanently alter the characteristics of the habitats, making them unsuitable for species which may count on them for escape cover, foraging areas, or thermal cover.

The No Action alternative would not increase negative impacts to wildlife species or their habitats.

- *Finding on the Public Land Health Standard for Plant and Animal Communities (partial, see also Vegetation)*: The No Action alternative would have no influence on the current land health status.

Proposed Action

Direct and Indirect Effects: The Proposed Action may temporarily displace some species, depending on when construction activities occur. Critical periods for wildlife include winter and early spring months for wintering mule deer and elk, and nesting season for raptors, passerines, and wild turkey. Activities during these critical periods may reduce productivity and temporarily displace species, but would likely not have permanent negative consequences. The Proposed Action would remove approximately 6.4 acres of sagebrush shrublands intermixed with grasslands until final reclamation is complete. The nominal amount of habitat disturbance would minimize the potential negative effects. In addition, the stipulation attached to this lease that imposes restrictions on lease activities between December 1 and April 30 annually would limit potential disturbance impacts to wintering big game.

Due to the amount of available habitat surrounding the project area, any unintentional take of migratory birds that may occur as a consequence of the Proposed Action would not result in a measurable effect on migratory bird populations in addition avoidance of vegetation disturbance during peak breeding season would limit the potential for individual nests to be destroyed. The requirements of Executive Order 13186 would be met (Code of Federal Regulations 2001).

Reserve pits would not be used to contain produced fluids. Produced fluids would be confined to flow back tanks on location. Drilling fluids would be contained and hauled by truck to another location (SUPO). Therefore, it is unlikely that terrestrial wildlife or birds would become entrapped in fluids containing hazardous or harmful chemicals.

Cumulative Effects: Construction of the proposed well pad should have very few long term negative consequences for wildlife species in the area. Cumulative effects of the Proposed Action contribute to further development in the project area vicinity and would remove suitable habitat for nesting migratory birds and wintering habitat for mule deer and elk. Timing limitations for deer and elk would lessen the impacts to these species during the winter months. At a landscape scale it is unlikely that the Proposed Action would result in a detectable change to migratory birds, turkey, mule deer, elk, and/or their habitats.

- *Finding on the Public Land Health Standard for Plant and Animal Communities (partial, see also Vegetation)*: The minimal disturbance associated with construction of the well pad is unlikely to have a detectable change to species at a landscape scale. The Proposed Action would not change the current land health status for plant and animal communities within the project vicinity.

Protective/Mitigation Measures: Construction, reclamation, maintenance, and operations considered by the AO to be intensive in nature in deer and elk severe winter range and winter concentration areas shall not be allowed between December 1 and May 1, unless otherwise approved by the BLM AO.

To protect nesting raptors, a Timing Limitation (TL) shall be applied to construction activities within a 0.25 mile buffer of tree-nesting raptor nest structures, or a 0.5 mile buffer of cliff-nesting raptor nest structures, if the activities would be initiated during the species specific nesting period. An exception to this TL may be granted for any year in which subsequent survey determines one of the following: (a) the nest is in a severely dilapidated condition or has been destroyed due to natural causes; (b) the nest is not occupied during the normal nesting period for that species; (c) the nest was occupied but subsequently failed due to natural causes; or (d) the nest was occupied but the nestlings have fledged and dispersed from the nest. In the case of a dilapidated nest or one that has been destroyed due to natural causes, the TL shall apply to any alternate or replacement nest within the buffer widths specified above, unless an exception is granted for the alternate or replacement nest for one of the reasons listed. Dates for species currently identified are: Golden Eagle - December 15 to July 15, Red-tailed Hawk - February 15 to July 15, and Cooper's Hawk - April 1 to August 15.

To comply with the Migratory Bird Treaty Act and BLM Instruction Memorandum 2008-050, as much vegetation clearing as possible would be completed outside of the migratory bird nesting season. The migratory bird nesting season is generally May 15 to July 15 in the GJFO. If vegetation removal cannot be planned and accomplished prior to May 15, then exception to this condition may be granted to allow work on the project during the closure period.

3.4 HERITAGE RESOURCES AND HUMAN ENVIRONMENT

3.4.1 Cultural Resources

Current Conditions: A Class III inventory including literature review of Federal lands in the of the Area of Potential Effect (APE), as defined in the National Historic Preservation Act (NHPA), was completed by Alpine Archaeological Consultants (Alpine 2011), a BLM permitted cultural consultant, (BLM C-46920). A total of 40 acres of public lands were surveyed, and a Cultural Resource Inventory Report, BLM CRIR 8311-01, was prepared. An historic segment of the Kimball Creek Road, a portion of the Kimball Creek Cemetery, and two trash disposal areas were recorded within the 40-acre inventory area. Site 5GF4512 is an abandoned segment of the original Kimball Creek Road resulting from the realignment and upgrade of Kimball Creek Road (aka Garfield County Road 202). The site was first recorded by Grand River Institute and determined officially Need Data in 2010. Alpine recorded the remaining portion of this segment and reevaluated the entire segment as not eligible under criteria a-d. Details of their findings are incorporated by reference to CRIR 8311-01. This site will be impacted by construction of the access road and a portion of the well pad. Site 5GF4543 is Kimball Creek Cemetery. There is no historic record of this property; it is not in county records or maps. It is on public land but may be maintained by a local family, descendants of Norman Robertson. It is unknown if remains are present in the cemetery but there are indications of five graves. Only one tombstone has a date, 1935. It is outside of the direct APE and will be avoided by the project. It is determined not eligible under criteria a-d and does not qualify under exceptions. Sites 5GF4544 and 5GF4545 are single event trash disposal sites dating from about 1940 and 1949, respectively. They are low density surface scatters in a secondary deposition and therefore have no potential for important information. Both are outside of the direct APE and will be avoided by the project. Both are determined not eligible under criterion d.

No Action

Direct and Indirect Effects: If the APD is not approved, no direct or indirect effects to cultural resources would take place.

Cumulative Effects: Drilling of wells on private land, livestock grazing, agricultural activities, and extensive recreation could have some impact on cultural resources in the Kimball and Roan Creek areas.

Proposed Action

Direct and Indirect Effects: The surveying archaeologist recommended that 5GF4543, the Kimball Creek Cemetery, could potentially be considered a Traditional Cultural Property (TCP) to Euro-American descendants who settled the area. No consultation on this TCP recommendation was conducted by the BLM. The site is outside of the proposed Encana activities and would be avoided in compliance with state laws protecting human remains. The Proposed Action would not result in any impacts to cultural resources eligible for the National Registry of Historic Places (NRHP). There is a potential for impacts to cultural resources that were not documented, with the resulting loss of information. Standard stipulations protect cultural resources from inadvertent discovery or unauthorized collection.

Cumulative Effects: Cumulative effects would be essentially the same as those for the no action alternative.

Protective/Mitigation Measures

All persons in the area who are associated with this project shall be informed that 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). Strict adherence to the confidentiality of information concerning the nature and location of archeological resources would be required of the proponent and all of their subcontractors (Archaeological Resource Protection Act, 16 U.S.C. 470hh)

The NHPA [16 USC 470s., 36 CFR 800.13], as amended, requires that if newly discovered historic or archaeological materials or other cultural resources are identified during the Proposed Action implementation, work in that area must stop and the BLM AO must be notified immediately. Within five working days the AO will determine the actions that will likely have to be completed before the site can be used (assuming in place preservation is not necessary).

The Native American Graves Protection and Repatriation Act (NAGPRA) [25 USC 3001 et seq., 43 CFR 10.4] requires that if inadvertent discovery of Native American Human Remains or Objects of Cultural Patrimony occurs, any activity must cease in the area of discovery, a reasonable effort made to protect the item(s) discovered, and immediate notice be made to the BLM AO, 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)). 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 inventoried and has no resource concerns, and the exposed materials are recorded and stabilized. Otherwise, the operator shall be responsible for mitigation costs. The BLM AO will provide technical and procedural guidelines for relocation and/or to conduct

mitigation. Upon verification from the BLM AO 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

3.4.2 Paleontological Resources

Current Conditions: The project area is located within the Piceance Geologic Basin in the Colorado Plateau Physiographic Province (Hail and Smith 1997). The topography is relatively flat, and the proposed pad and access reside on alluvial material, to the north of Kimball Creek. The surficial geology in the project area is predominantly Quaternary alluvium and colluviums in the drainage bottoms and on the lower slopes of Kimball Mountain. Alluviums are unconsolidated gravel, sand, silt and clay found along streambeds. Colluviums are landslides; talus and slope wash deposits on the upland slopes. The 1987 RMP identifies the area of the Proposed Action as a Class II or Class III paleontological area (BLM 1987). In the more recent Potential Fossil Yield Classification (PFYC) system (BLM 2007), the relatively recent alluvial and colluvial surface geological layers would be placed in a Class 2 category. Class 2 geologic units have a low probability of containing vertebrate fossils or scientifically significant non-vertebrate fossils. The underlying Wasatch formation was placed in a Class I category in the 1987 RMP. The Wasatch would most likely be placed in Class 5 under the current PFYC system. Class 5 geologic units consistently produce vertebrate fossils or scientifically significant invertebrate or plant fossils.

The BLM paleontological resource database was reviewed to see if there were any inventoried sites in the project area and none were found.

No Action

Direct and Indirect Effects: There would be no effects on Paleontological Resources from the No Action Alternative.

Cumulative Effects: There would be no effects on Paleontological Resources from the No Action Alternative.

Proposed Action

Direct and Indirect Effects: The proposed well pad and access road are located on alluvium, and all proposed dirt work would take place in this surface material. There is little likelihood of encountering fossils.

Cumulative Effects: It is unlikely that the Proposed Action activities would have cumulative effects on Paleontological Resources.

Protective/Mitigation Measures: The Standard Education/Discovery stipulation for paleontological resource protection would protect any newly discovered paleontological resources. Under the stipulation, if resources are discovered all work in the area should cease and the BLM AO notified immediately.

3.4.3 Visual Resources

Current Conditions: The proposed project area is located adjacent to Garfield County Road 202 in the Kimball Creek valley near the eastern edge of the Colorado Plateau physiographic province. The project is sited within Visual Resource Inventory (VRI) Class III, Scenic Quality B (Scenic Quality Rating Unit 09) (BLM 2009b). The immediately adjacent Kimball Mountain is classified as VRI Class II.

The characteristic landscape is an enclosed valley at the base of a series of gently sloping rounded foothills that quickly transition into the steep slopes and exposed cliffs of Kimball Mountain. The topography is dominated by the large pyramidal form, diagonal lines and horizontal banding of Kimball Mountain. Colors are predominantly mottled shades of dark green created by the pinyon-juniper vegetation, along with lighter shades of green, tan and grey, creating a medium to coarsely mottled texture on the landscape. The only visible built element in the immediate vicinity is a residence approximately 0.5 miles east of the site.

The area is primarily used by ranchers, oil and gas operators, and hunters who would constitute the typical casual observer.

Under the current RMP, the visual resource management class is undesignated for the project area. It has been the general practice of the GJFO to manage undesignated areas with VRM Class III objectives (BLM 1987). VRM Class III objectives are “to partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape” (BLM 1987).

No Action

Direct and Indirect Effects: There would be no direct or indirect effects under the No Action Alternative.

Cumulative Effects: Under the No Action Alternative the visual landscape would continue to change due to on-going natural gas drilling and gathering activities, maintenance and improvement of roads, and private land development. These activities would have a relatively long-term effect on the visual quality of the view shed.

Proposed Action

Direct and Indirect Effects: The casual observer would usually be traveling by vehicle along CRs 202 and 204. The observer would see pad and access road construction for a two-week period, and drilling activity for approximately three weeks for the first well and four weeks for the second well. If the wells are placed into production, the facility would be visible from the nearby residence and county roads for a long-term period. The residents of the nearby home would see the pad and access road during construction and drilling activities for approximately 8 weeks. Lighting for operations safety during drilling activities would be utilized throughout the night-time for approximately 6 weeks and would be visible from the residence during this period. Constructing a level drill pad and access road would cause a weak contrast to the form of the land through vegetation removal, leveling and flattening the location site and access road. It would cause moderate line contrast through introduction of the pad and road, both of which would be visible linear features. Exposing the soil would cause a weak contrast to the color in

the landscape. The texture of the exposed soil would add smoothness to the landscape creating a weak contrast. The cylindrical and rectangular form of the proposed structures would contrast moderately with the existing landform. They would introduce distinct vertical lines which would moderately contrast with the existing rolling landscape. The texture created by the addition of structures into the landscape would create moderate contrast with the texture of the characteristic landscape, which is primarily influenced by the rolling, mottled landform.

To lessen the visual impacts, Encana has committed to paint any structures that would be on site for 6 months or more with a flat non-reflective earth toned color, which would lessen the visibility of the facility from observation points within the immediate vicinity. The BLM recommended color for facilities at the site is Shale Green. Interim reclamation of the pad location would also lessen its contrast and visibility for the life of the wells.

The project area has a relatively high level of existing contrast consisting of roads, agricultural land, structures, and fences. Because the visual modifications caused by this well facility would not dominate the landscape from the several observation points, the Proposed Action would meet the objective of the VRM III classification.

Cumulative Effects: The visual landscape would continue to change due to on-going natural gas gathering activities, maintenance/improvement of roads, and changes in private land use. These activities would have a relatively long-term effect on the visual quality of the view shed.

Protective/Mitigation Measures: None

3.4.4 Social

Current Conditions: This area is located in Garfield County, which has a population of approximately 56,389 (U.S. Census Bureau 2010). The closest town to the project area is DeBeque, which is in Mesa County, with a population of about 504 (U.S. Census Bureau 2010). Mesa County has a population of 146,723. Grand Junction, Colorado, with a population of 58,566 (U.S. Census Bureau 2010), is the closest large city and the regional hub of banking, health care, retail trade, and government services in western Colorado and eastern Utah. Rio Blanco County, located directly north of Garfield County, has a population of approximately 6,666 (U.S. Census Bureau 2010). Population growth in Garfield and Mesa Counties has grown constantly since 1970, with reduced growth rates from 1980 through 1990. Rio Blanco County's population dropped between 1980 and 1990, and in 2010 barely exceeded the 1980 population level (U.S. Census Bureau 2011). Additional important industries in these Western Colorado counties include tourism, energy services, health care, ranching, and fruit and vegetable farming. Tourism in the counties focuses on outdoor recreation activities, including hunting, fishing, rafting, kayaking, bicycling, hiking, and skiing.

During 2010, there were approximately 1,184 people directly employed in oil and gas production activities in Garfield, Mesa, and Rio Blanco counties (DOLA 2011). At least some of the labor associated with the Proposed Action would probably come from areas outside the above counties and would not result in any permanent change to the social conditions or populations of Garfield or Mesa County.

No Action

Direct and Indirect Effects: There would be no direct or indirect effects to the local social structure under the No Action Alternative.

Cumulative Effects: As the local population continues to grow, as expected from Census predictions, the influx of people from outside the local area would change the social structure of the counties.

Proposed Action

Direct and Indirect Effects: Production operations would make a minor contribution to a more stable long-term workforce with its concurrent change in the social culture of the counties. However, the Proposed Action's effects on the social environment of the counties would be marginal.

Cumulative Effects: Under the Proposed Action cumulative effects would be essentially the same as the No Action alternative.

Protective/Mitigation Measures: None

3.4.5 Economic

Current Conditions: The construction, drilling, and production resources would be drawn primarily from Garfield, Mesa, and Rio Blanco Counties. County demographics are provided in the Social Section 3.4.4. All of the counties experienced a substantial economic and demographic growth in the late 1970s and early 1980s as major energy companies attempted to develop oil shale as a national energy fuel source. After a decline in jobs and population from the boom levels, the number of jobs and people in the counties has increased slowly (DOLA 2011). The traditional farming and ranching sector has been supplemented by a growing number of jobs in the oil and gas extraction industry and related supporting businesses. Median household income in Mesa County is \$52,290, slightly below the Colorado average. Garfield County's median household income of \$62,217 is slightly above the Colorado average. Rio Blanco County's median household income of \$59,017 is slightly above the Colorado average (U.S. Census Bureau 2011). Almost all of the resources for development of the oil and gas resource come out of Garfield, Mesa, Rio Blanco Counties, or sometimes Uintah County in Utah. Many jobs are filled on a temporary basis. In addition to oil and gas exploration and development, agriculture is a major economic activity in the immediate project area. Although big game hunting is seasonal in nature it is an important contributor to the local economies.

No Action

Direct and Indirect Effects: Denial of the APD would not impact the economy of the three-county area in any detectable way.

Cumulative Effects: Exploratory drilling and gas production would continue to exert a major influence on the economic conditions in Garfield, Mesa and Rio Blanco counties for the foreseeable future.

Proposed Action

Direct and Indirect Effects: The Proposed Action would result in some short-term employment for those individuals involved in drilling activities, and those local businesses which provide support for oil and gas drilling activity. Considering the level of drilling and field

development in these counties, these two wells alone would not likely to create a detectable positive effect on the local economy. If the wells are ever placed into production, there would be long-term positive economic benefits, and more stable employment associated with the production aspects of energy development.

A portion of the royalties paid to the federal government for gas produced from these wells would be returned to Garfield County, and increased property tax revenue would be a contributor to the revenues of Garfield County and to some extent Mesa County (BLM 2004). If producing, these two wells alone would result in a negligible increase on royalty and property tax benefits to Garfield County.

Cumulative Effects: When combined with the more widespread oil and gas development activities in Garfield County, these two wells would, to a small degree, add to the employment income for the residents of Garfield, Mesa, and Rio Blanco counties. The wells, if under production, would also increase property tax revenue to Garfield County, and royalty payments resulting from gas production (BLM 2004).

Protective/Mitigation Measures: None

3.4.6 Noise

Current Conditions: The noise levels in the project area are typical of rural agricultural areas. Traffic on County roads 202 and 204 are major contributors to noise especially when there are drilling or production activities taking place in the Roan Creek watershed. Traffic noise is sporadic rather than the continual noise generated by construction, or the round-the-clock noise generated by drilling activity. Noise levels in the project vicinity can vary seasonally as a result of increased traffic associated with activities such as big game hunting. Some background noise, resulting from drill pad construction and drilling activity elsewhere in the watershed is likely to be detectable at local residences on occasion. Drilling activities are subject to COGCC Rules and Regulations for Aesthetics and Noise Control (COGCC 2009), which places limits on decibel levels for oil and gas operations. The levels vary depending on the setting of the well, e.g., rural, industrial, agricultural, etc.

No Action

Direct and Indirect Effects: If these two wells are not approved, there would be no related impacts to the ambient noise levels in the project area.

Cumulative Effects: Noise generated by oil and gas activities on fee and public land within the Roan Creek watershed would continue to create some effect on the project area. The effect of noise generated by these activities would depend, in part, on time of day and weather conditions.

Proposed Action

Direct and Indirect Effects: Construction and drilling activities would generate considerable noise and drilling activity which generally takes place 24 hours per day, would have the greatest impact during the 3 week drilling period for the first well and 4 week drilling period for well number two. The most noticeable impact would be to the single residence located 0.6 miles downstream on Kimball Creek. Nearby residences upstream on Kimball Creek, and on Roan Creek would also notice an increase in ambient noise levels during the construction and

drilling phases of the operation. Noise generated during the production phase would be minimal, and generally associated with periodic truck traffic.

Cumulative Effects: Although the noise generated by the Proposed Action would be added to the other noise sources in the watershed, noise effects within the watershed would be essentially identical to those for the no action alternative.

Protective/Mitigation Measures

Due to the proximity of the closest residence and other residences in Kimball and Roan Creek, COGCC noise regulations for residential, rural and agricultural areas would apply (COGCC 2009). Should the nearby residence be vacant, the light industrial noise levels may be applied. Noise level restrictions for both zones are shown in Table 3.4.5-1. COGCC rules state that in most cases sound level readings would be taken at a distance of 350 feet from the source of the noise; however, under COGCC regulations, this distance can be modified to fit the circumstances. To ensure noise levels are in compliance with COGCC regulations a monitor station/data logger would be temporarily installed between the well pad and residence, at a distance of 350 feet from the well pad. Records of the monitor station would be made available at the well pad and emailed to the BLM AO weekly. If noise levels exceed the maximum allowable, Encana would install temporary sound walls to reduce levels to meet the COGCC rules. Encana may elect to install sound walls in lieu of monitoring and avoid subsequent potential shutdown periods. Pursuant to COGCC regulations, if an adjacent landowner complains about noise from the activities at the well location, an onsite inspection by COGCC would occur, and additional noise measurements appropriate to the situation would take place.

Table 3.4.5-1: Colorado Oil and Gas Conservation Commission Noise Level Restrictions

ZONE	7:00 am to next 7:00 pm	7:00 pm to next 7:00 am
Residential/Agricultural/Rural	55 db(A)	50 db(A)
Light Industrial	70 db(A)	65 db(A)

3.4.7 Transportation and Access

Current Conditions: Access to the project area is from Interstate 70, then north on the Roan Creek Road (Mesa County Road 45 (CR45)) to the Garfield County line. From the County line Roan Creek Road becomes Garfield County Road 204 (CR 204) continues up Roan Creek to the north (Figure 1). CR204 is paved up to and beyond the intersection of County Road 202 (CR202, also called the Kimball Creek Road). Approximately 2.4 miles of CR202, would be utilized for access to the proposed well site. Access from CR202 to the well location would be via a short access road to be constructed by Encana. CR202 in this area is a graveled all-weather road. Public lands are open to off road vehicle traffic (BLM 1987).

Local residents, ranchers, outfitter guide clients, oil and gas operators, and recreational visitors use the county roads for access to the upper portions of the Roan Creek watershed. Oil and gas operators are significant users of the roads. Heavy truck traffic, especially hauling water to the drilling operation and hauling produced water to disposal facilities is expected.

A user created two track road crosses the proposed well pad location. The road, from its intersection with CR202 is oriented to the north and is approximately 0.15 miles in length. The

road is not used for access to any BLM permitted facilities or activities. It receives occasional use during hunting season.

No Action

Direct and Indirect Effects: Denial of the permit for these particular Encana wells would not have any impact on the transportation system.

Cumulative Effects: Access and Transportation effects from oil and gas operations and other activities in the area would continue, with impacts similar to those for the Proposed Action.

Proposed Action

Direct and Indirect Effects: Short-term increases in the volume of both heavy and light traffic would occur during the construction, drilling, and reclamation activities. Potential impacts to travel and access of other users would include minor temporary conflicts with existing traffic (including a potential for delays and increased vehicle accidents). The most likely conflicts with traffic flow and greatest potential for accidents would be on CR202 at the well pad location.

Degradation of the county road may occur due to heavy truck traffic. However, Encana has committed to maintaining existing roads in the same or better condition than prior to commencement of operations, and to continue that maintenance through abandonment and reclamation.

The user-created dead end two-track road would be blocked by the proposed well pad and no longer usable for recreational purposes.

Cumulative Effects: The proposed wells when combined with other oil and gas activity in the Roan Creek watershed would incrementally add to heavy truck traffic on the Mesa and Garfield county roads leading into the project area. Truck traffic on Interstate 70 would also see a minor increase if water is trucked from Encana's property on Parachute Creek.

Protective/Mitigation Measures: Encana would be required to obtain any necessary Transportation Permits from Garfield County for oversize or overweight vehicles.

If traffic is disrupted during construction then suitable traffic control measures would be implemented. Traffic control measures would include warning signs, barriers or flagmen unless otherwise approved by the AO.

Protective/Mitigation Measures: None

3.4.8 Wastes, Hazardous or Solid

Current Conditions: No hazardous materials are known to have been used, stored, or disposed of at well pad location. Wastes that may be encountered in the project area during the proposed activities are those commonly associated with construction, drilling, and gas production (e.g., debris, fuels, lubricants, liquid hydrocarbons, produced water, etc.).

Hazardous materials are frequently used in drilling operations for oil and gas wells. The Glenwood Springs Draft Oil and Gas RMP Amendment (BLM 1998) contains a list of these common materials and their characteristics. It also includes a description of the common industry practices for use of these materials and disposal of the waste products. The most

pertinent of the Federal laws dealing with hazardous materials contamination are The Oil Pollution Act (Public Law 101-380, August 18, 1990), The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (Public Law 96-510 of 1980) and The Resource Conservation and Recovery Act (RCRA) (Public Law 94-580, October 21, 1976).

Hazardous materials response plans required of oil and gas operators and their contract trucking companies substantially reduce the potential for significant long-term consequences. Hazardous substances specifically listed by the Environmental Protection Agency (EPA) as a hazardous waste or demonstrating a characteristic of a hazardous waste would not be used in drilling, testing, or completion operations.

No Action

Direct and Indirect Effects: If the drilling operation is not approved, no hazardous wastes would be generated on or transported to this location.

Cumulative Effects: Oil and gas operations, as well as other human activities in the area would continue to offer the potential to generate hazardous materials in the Roan Creek watershed.

Proposed Action

Direct and Indirect Effects: Hazardous materials that may be used or produced as a consequence of the proposed pad construction and well drilling include: cementing and plugging materials, fracturing fluids and materials, produced water, petroleum condensates from the wells, combustion emissions, equipment fuels, hydraulic fluids, and other materials in small quantities.

As outlined in the SUPO and their Oil Spill Contingency Plan (Encana 2011a), Encana commits to a number of practices to minimize potential impacts associated with hazardous materials. All drilling fluids would be contained in a closed loop system that would reduce the potential for any hazardous materials associated with drilling mud, subsurface water, or petroleum condensates from being deposited on the drilling site. Fluids, including produced water would be disposed of at a licensed facility or utilized in other drilling or fracturing operations in the area. Encana has committed to retain chemicals onsite in secondary containment. Liquid hydrocarbons produced during natural gas production would be confined to flow back tanks on site. All human wastes would be contained in chemical toilets and disposed of at a licensed location. Wastes may also be contained in county approved ISDS vault and haul systems for off-site disposal. A trash cage would be used to contain debris and other waste materials. Immediately after removal of the drill rig, all trash and waste materials would be cleaned up and removed from the location. Any spills of potentially hazardous materials would be reported immediately to BLM and other appropriate agencies; spills would be mitigated immediately. Dikes constructed of compacted subsoil would be constructed on all production facilities. The dikes would be constructed of compacted subsoil, be impervious, hold 110 percent of the capacity of the largest tank, and be independent of the back cut.

Cumulative Effects: As in the No Action alternative, oil and gas activities as well as other human activities in the Roan Creek watershed would have the potential to generate hazardous materials. The proposed pad and wells would add minor additional risks for hazardous material generation.

Protective/Mitigation Measures: None beyond those required by State and federal law, and those proposed by Encana.

3.5 LAND RESOURCES

3.5.1 Range

Current Conditions: The pad and wells would be located within the BLM Kimball Creek allotment. Approximately 194 Animal Unit Months (AUMs) of forage for up to 50 head of cattle are authorized annually. Grazing takes place in the fall and spring of the year in the time period shown in Table 3.5.1-1. Within this allotment, approximately 63 acres would be required to produce one AUM (the volume of forage required to support one cow and one calf for one month). WWE field personnel did not note any range improvement projects on areas that could be impacted by pad construction and drilling operations.

No Action

Direct and Indirect Effects: There would be no direct or indirect effects under the No Action Alternative.

Cumulative Effects: Other grazing activities would continue in the area on both private and public lands.

Table 3.5.1-1: Range Management Allotments

Allotment	Livestock Kind and Number	Season of Use	Federal Acres in Allotment	AUM's
Kimball Creek (#6724)	50 cattle	03/01 to 05/30 and 11/01 to 11/30	12,283	194

Proposed Action

Direct and Indirect Effects: Surface disturbing activities such as construction would remove approximately 0.1 AUMs of forage or 0.05 percent of the forage in the allotment that is available to livestock. In all probability, this loss would easily be within the normal range of variability that could be expected within an allotment of this size. Therefore, it is unlikely that any adjustment in livestock stocking rate would be required. Since the proposed drilling activity is located adjacent to a county road and private land, human activity and noise is unlikely to result in any noticeable change in livestock distribution or use of the area. Due to increased traffic, some increase in livestock mortality from vehicle collisions is possible.

When rehabilitation is successful, the site may produce slightly more forage than the existing shrub dominated site. Long-term impacts to livestock forage would be reduced or eliminated by site reclamation.

Cumulative Effects: Impacts would be similar in nature to the Proposed Action.

Protective/Mitigation Measures: Any range improvements (i.e., fences) that are removed or damaged by activities associated with pad construction or well drilling operations should be, repaired, to the satisfaction of the AO, as soon as possible and contained in the standard COAs.

3.5.2 Recreation

Current Conditions: According to the 1987 RMP, the project area lies within an unclassified Recreation Management category. The Off-Road Vehicle (ORV) Management Designation was “open – general areas where no significant ORV issues occur” (BLM 1987). Hunters in the area frequently use ORVs and hunting is the primary recreational activity. The ongoing revision process for the RMP proposes some changes to the 1987 RMP, including the travel management designations. Revised travel management designations for the project area have not been finalized. No developed recreational facilities, such as campgrounds or picnic areas are located within or near the project area. Recreation use in the area can be characterized as dispersed recreation with a relatively low level of intensity. The exception to this general description is big-game hunting in the fall. The Project Area is located in CDOW GMU 31. This GMU has historically been very popular with big-game hunters and can be expected to remain so into the future. The GJFO manages two Special Recreation Permits (SRPs) for big game hunting and four SRPs for mountain lion hunting in the area. The following outfitters are authorized to operate in the project area: Bear Paw Outfitters, High Lonesome Lodge, Alamenno Outfitters, Backcountry Outfitters, Cat Track Outfitters, and Mark Davies Outfitters. A user-created two track road, as described in Section 3.4.7, that is used occasionally for recreational purposes crosses the area that would be utilized for the proposed well pad.

No Action

Direct and Indirect Effects: No impacts to recreation activities would occur if the proposed wells are not approved.

Cumulative Effects: Continued oil and gas activities in the Roan Creek watershed would continue to have an impact on recreation users for the long-term. Big game hunters would be impacted by changes to habitat and potential changes in animal distribution.

Proposed Action

Direct and Indirect Effects: The proposed action would result in increased vehicle traffic, noise, dust, and human activity during the construction, drilling, and completion phases of the project, and continuing to a more limited degree, throughout the operational life cycle of the project. Construction and well drilling activities would likely displace some game species in localized areas within close proximity to these activities, and both hunters and game would be displaced to other locations outside of the project area. The road construction, and well pad developments would contribute to a decline in the area’s naturalness, altering the setting character for recreation opportunities in the area.

The user-created two-track road would be blocked by construction of the well pad resulting in the loss of 0.15 miles of vehicle access to public land recreational use.

Cumulative Effects: The proposed action, along with other drilling activities in the area would incrementally reduce naturalness, and would likely alter game species use patterns, potentially reducing hunting opportunities and success rates. Other effects on recreation would be related to general recreation and demographic trends in the region.

Protective/Mitigation Measures: None.

3.5.3 Lands and Realty

Current Conditions: A search of the BLM LR2000 database was performed in order to identify what ROW and lands are located within legal section where the proposed drilling project would take place. The only BLM ROW in the immediate area of the Proposed Action is a held by Quest Corporation for a telephone – telegraph line (COC-038537) (BLM 2011b). There are no known Cadastral Survey markers that would fall within the proposed well pad disturbance envelope.

No Action

Direct and Indirect Effects: None

Cumulative Effects: Continued oil and gas activities in the Roan Creek watershed could impact this and other BLM ROW holders.

Proposed Action

Direct and Indirect Effects: There is a potential for direct conflict between construction disturbance and equipment, and the existing Quest ROW. Although no Cadastral Survey markers should be located within the disturbance envelope of the proposed pad, there is the potential for damage or destruction of such markers. Encana's commitment to protection of survey markers of all types, and restoration of any damaged markers, would protect those resources from damage or destruction.

Encana has also committed to contacting natural gas operators in the area to make certain that there are no unidentified natural gas pipelines that would be disturbed by construction or drilling activities, thereby, eliminating a potential conflict with any unauthorized facilities that may be present on public lands at the proposed well pad location.

Cumulative Effects: Cumulative effects would be identical to those of the No Action alternative.

Protective/Mitigation Measures: The operator shall notify all existing ROW holders in the project area prior to beginning any surface disturbance or construction activities. The operator shall obtain an agreement with any existing ROW holders or other parties with authorized facilities that cross or are adjacent to those of the operator to assure that no damage to an existing ROW or authorized facility would occur. The agreement(s) shall be obtained prior to any use of the ROW or existing facility.

As Built Details: The operator shall submit to the AO within 30 days of setting production facilities, a digital as-built file of the following: the perimeter of the pad collected at the base of fill slopes and at the head of cut slopes including all associated soil locations, the wellhead(s), and the centerline of the access road. The digital depiction shall be in a format that is GIS compatible (shapefiles) in NAD83, UTM coordinate system.

3.5.4 Fire Management

Current Conditions: The proposed well pad falls within the Upper DeBeque Fire Management Unit (FMU B-130-01). Within this unit, fire plays a natural role in the ecosystem, but because of the potential for high economic impacts fire suppression is usually aggressive (BLM 2008c). The plant community on the pad site is primarily shrub dominated, and fire risks are moderate.

No Action

Direct and Indirect Effects: There would be no direct or indirect effects from denial of the APD.

Cumulative Effects: Activities, with the potential to cause wildfires would continue throughout the Roan Creek watershed.

Proposed Action

Direct and Indirect Effects: As with any industrial activity in a remote area, the potential for human caused fires would be increased somewhat. Encana intends to ask for permission to utilize slash and brush, as part of their sediment control measures, as short and long term BMPs for the pad location. Root balls would be buried or stored off location for use during reclamation. Slash that is piled or stored improperly could result in increased wildfire risks.

All trash would be contained in a fully enclosed trash cage and hauled to an approved landfill, which would lessen fire risk from those materials.

Cumulative Effects: The Proposed Action could result in a slightly elevated fire risk, which is unlikely to be measurably greater than that of the No Action alternative.

Protective/Mitigation Measures: In order to reduce wildfire risks, Encana must stockpile and utilize vegetative slash to avoid concentrations of material, especially root balls and woody debris, as directed by the AO.

Welding, acetylene or other torch, with open flame, shall be operated in an area barren or cleared of all flammable materials and vegetation at least ten feet on all sides from equipment. Internal combustion engines should be equipped with an approved spark arrestor. Any wildfires started on BLM lands would be reported to UCR Grand Junction Dispatch immediately.

See also the Hazardous Materials section for handling of other flammable substances.

CHAPTER 4 - CONSULTATION AND COORDINATION

4.1 LIST OF PREPARERS AND PARTICIPANTS

INTERDISCIPLINARY REVIEW

BLM - Grand Junction Field Office		
NAME	TITLE	AREA OF RESPONSIBILITY
Cathy Ventling	Natural Resource Specialist	Realty Authorizations, Oil and Gas
Christina Stark	Natural Resource Specialist	Riparian, Floodplains
Aline LaForge	Archaeologist	Cultural Resources, Native American Religious Concerns
Chris Pipkin	Outdoor Recreation Planner	Transportation and Access, Recreation, VRM, Wilderness, ACECs
Scott Gerwe	Geologist	Minerals, Geology, Paleontology
Alan Kraus	Hazard Materials Specialist	Hazardous Materials
Heidi Plank	Wildlife Biologist	Migratory Bird Treaty Act, T&E Species, Terrestrial & Aquatic Wildlife
Anna Lincoln	Ecologist	Land Health Assessment, T&E Plant Species
Kristen Meyer	Wildlife Biologist	Migratory Bird Treaty Act, T&E Plant & Animal Species, Terrestrial & Aquatic Wildlife
Scott Clark	Range Management Specialist	Vegetation and Range
Collin Ewing	Environmental Coordinator	Environmental Coordinator
Nate Dieterich	Hydrologist	Air Quality, Water Quality, Soils, Hydrology, Water Rights
Jacob Martin	Range Management Specialist	Forestry
Mark Taber	Range Management Specialist	Invasive, Non-Native Species (Weeds)
Lathan Johnson	Fire Ecologist Natural Resource Specialist	Fire Ecology and Fuels Management
John Toolen	Wildlife Biologist	Migratory Bird Treaty Act, T&E Species, Terrestrial & Aquatic Wildlife

WestWater Engineering, Inc. - Third Party Contractor		
NAME	TITLE	AREA OF RESPONSIBILITY
Jim Ferguson	Environmental Scientist EA Coordinator	Project Coordinator. Air Quality and Climate, Geologic Resources, Minerals Resources, Range, Forest and Fire Management
Amie Wilsey	Biologist/Environmental Scientist	Invasive, Non-native Species; Sensitive Species; Threatened or Endangered Species; Vegetation; Wetlands and Riparian Zones; Wildlife, project coordination
Jim Ferguson/Mary Nichols	Environmental Scientist Geologist	Paleontological Resources, Visual Resources, Social, Economics, Noise, Transportation and Access, Wastes, Recreation, Lands and Realty, Special Designations, Wild and Scenic Rivers
Carl Conner, Grand River Institute	Archaeologist	Cultural Resources
Mike Villa	Technical Reviewer	

4.2 TRIBES, INDIVIDUALS, ORGANIZATIONS, OR AGENCIES CONSULTED

Encana Oil and Gas (USA), Inc.
U.S. Fish and Wildlife Service
Colorado Division of Wildlife
Colorado State Historic Preservation Office

CHAPTER 5 – REFERENCES

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APPENDIX A – MITIGATION MEASURES

Drilling Conditions of Approval

1. Twenty-four hours *prior* to (a) spudding, (b) conducting BOPE tests, (c) cementing/running casing strings, and (d) within twenty-four hours *after* spudding, the Grand Junction Field Office (GJFO) shall be notified.
2. Contact this office for a verbal approval prior to commencing remedial work, plugging operations on newly drilled boreholes, changes within the drilling plan, sidetracks, changes or variances to the BOPE, deviating from conditions of approval, and conducting other operations not specified within the APD.
3. If a well control issue or failed test (e.g., kick, blowout, water flow, casing failure, or a bradenhead pressure increase) arises during drilling or completions operations, Bob Hartman 970-244-3041 (office) shall be notified within 24 hours from the time of the event. IADC/Driller's Logs and Pason Logs (mud logs) will be forwarded to the GJFO within 24 hours of a well control event.
4. The BOPE shall be tested and conform to Onshore Order No. 2 for a 5M system and recorded in the IADC/Driller's log. A casing head rated to 5,000 psi or greater shall be utilized.
5. On the first well drilled on this pad, a triple combo open-hole log shall be run from the base of the surface borehole to surface and from TD to bottom of surface casing shoe. This log shall be in submitted within 48 hours in .las and .pdf format to the GJFO.
6. Submit the (a) mud/drilling log (e.g., Pason disc), (b) driller's event log/operations summary report, (c) production test volumes, (d) directional survey, and (e) Pressure Integrity Test results within 30 days of completed operations (i.e., landing tubing) per 43 CRF 3160-9 (a).

Surface Standard Conditions of Approval

1. Administrative Requirements: The operator shall notify the BLM representative at least 48 hours prior to initiation of construction or reclamation activities. If requested by the BLM representative, the operator shall schedule a pre-construction meeting, including key operator and contractor personnel, to review all lease stipulations and conditions of approval (COAs), prior to initiation of surface disturbance.
2. Soils: Cuts and fills shall be minimized when working on erosive soils and slopes in excess of 30 percent. Cut-and-fill slopes shall be stabilized through revegetation practices with an approved seed mix shortly following construction activities to minimize the potential for slope failures and excessive erosion. Fill slopes adjacent to drainages shall be protected with well-anchored silt fences, straw wattles, or other acceptable BMPs designed to minimize the potential for sediment transport. On slopes greater than 50 percent, BLM personnel may request a professional geotechnical analysis prior to construction.

3. Construction, Vegetation Removal, Topsoil Stripping and Storage: When saturated soil conditions exist on access roads or pads, construction shall be halted until soil material dries or thaws or until construction can proceed without soil damage. No topsoil shall be stripped when soils are saturated or frozen below the stripping depth. Prior to construction or pipeline installation, areas of such approved activities shall be cleared of trees, which shall be chipped or shredded in place, then salvaged and stored with topsoil. No stump left in place shall exceed six inches in height. Brushy vegetation may be windrowed before topsoil stripping and scattered on reclamation areas.

All topsoil shall be stripped following removal of vegetation during construction of well pads, pipelines, roads, or other surface facilities. In areas of thin soil, a minimum of the upper 6 inches of surface material shall be stripped. The BLM may specify a stripping depth during the onsite visit or based on subsequent information regarding soil thickness and suitability. The stripped topsoil shall be stored separately from subsoil or other excavated material and replaced prior to final seedbed preparation. The BLM best management practice (BMP) for the windrowing of topsoil shall be implemented for well pad construction whenever topography allows (refer to the BLM 2009 PowerPoint available upon request). Topsoil berms shall be seeded within 30 days to maintain soil microbe health, reduce erosion, and prevent weed establishment.

4. Road Construction and Maintenance: Roads shall be crowned, ditched, surfaced, drained with culverts and/or water dips, and constructed to BLM Gold Book (USDI, USDA 2007) standards. Initial gravel application shall be a minimum of 6 inches. The operator shall provide timely year-round road maintenance and cleanup on the access roads. A regular schedule for maintenance shall include, but not be limited to, blading, ditch and culvert cleaning, road surface replacement, and dust abatement. When rutting within the traveled way becomes greater than 6 inches, blading and/or gravelling shall be conducted as approved by the BLM. Ditches shall be allowed to vegetate and/or shall include large rocks or stones to slow the velocity of drainage and allow sediment to settle out. Ditches may be seeded where soils are erodible.
5. Dust Abatement: The operator shall prevent and abate fugitive dust as needed. The BLM may direct the operator to change the level and type of treatment if dust abatement is insufficient. BLM approval is required before application of surfactants, binding agents, or other dust-suppression chemicals on roadways within public lands. Speed control measures on all project-related unpaved roads shall also be required.
6. Jurisdictional Waters of the U.S.: The operator shall obtain appropriate permits from the U.S. Army Corps of Engineers (USACE) prior to discharging fill material into waters of the U.S. in accordance with Section 404 of the Clean Water Act. Waters of the U.S. are defined in 33 CFR Section 328.3 and may include wetlands as well as perennial, intermittent, and ephemeral streams. Permanent impacts to waters of the U.S. may require mitigation. Contact the USACE Colorado West Regulatory Branch at 970-243-1199. Copies of any printed or emailed approved USACE permits or verification letters shall be forwarded to the BLM.
7. 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. Culverts at drainage crossings shall be designed and installed to pass a 25-year or greater storm event. The minimum culvert diameter in any installation for a drainage crossing or road drainage shall be 24 inches. Crossings of drainages deemed to be jurisdictional waters of the U.S. pursuant to Section 404 of the Clean Water Act may require additional culvert design capacity. Due to the flashy nature of area drainages and anticipated culvert maintenance, the USACE recommends designing drainage crossings for the 100-year event. Contact the USACE Colorado West Regulatory Branch at 970-243-1199.

8. Water Protection: Where roads cross ditches or drainages, culverts shall be sized to prevent obstruction to the free flow of the volumes of water being carried, inclusive of flood stages. Operator shall protect all water sources and conveyance structures including, but not limited to, wells, ditches, ponds, and the natural flow of creeks from all operational activities, and shall immediately remedy any diversion, curtailment or blockage of water flows or contamination of water sources caused by Operator activities.
9. Range Management: Damage to range improvements (fences, gates, reservoirs, pipelines, etc.) shall be avoided during development of oil and gas resources. If range improvements are damaged during exploration and development, the operator shall repair or replace the damaged range improvements. If a new or improved access road bisects an existing livestock fence, a steel frame gate or a cattle guard with bypass gate shall be installed across the roadway to control grazing livestock.
10. Reclamation: Prior to interim reclamation, the operator shall meet with BLM to inspect the disturbed area, review the existing reclamation plan, and agree upon any revisions to the plan. The objectives of interim reclamation are to return the disturbed area to productive use and meet the objectives of the land and the resource management plan. Interim reclamation will be considered successful when disturbed areas not needed for long-term production operations or vehicle travel have been recontoured and stabilized; revegetated with a self-sustaining, vigorous, diverse, native (or otherwise approved) plant community that minimizes visual impacts, provides forage and stabilizes soils. Seeded species will be considered firmly established when at least 50 percent of the new perennial plants are producing seed.
 - a. *Deadline for interim reclamation earthwork and seeding*
Interim reclamation to reduce a well pad to the maximum size needed for production, including earthwork and seeding of the interim reclaimed areas, shall be completed within 6 months following completion of the last well planned on that pad. Deadline is subject to extension on a case-by-case basis upon approval of the BLM, based on season, timing limitations, or other constraints. If an extension is needed, a request shall be submitted writing to the BLM. If an extension is granted, temporary surface stabilization (hydro-mulch, erosion matting, etc.) may be required.
 - b. During interim reclamation, slopes would be re-contoured to minimize areas that exceed a 3:1 slope. Any areas exceeding the 3:1 slope criteria or with high walls shall be reclaimed using enhanced stabilization and erosion prevention methods.

c. *Seedbed preparation*

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. The BLM may also require soil amendments if topsoil is inadequate. Final seedbed preparation shall consist of scarifying (raking or harrowing) or roughening the spread topsoil prior to seeding.

d. *Seed Mixes*

All disturbed areas shall be seeded with a seed mixture approved by the BLM and be consistent with BLM standards in terms of species and seeding rate for the specific habitat type within the project area. 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 tags or other official documentation shall be submitted to BLM at least 14 days before the date of proposed seeding for acceptance. Seed that does not meet the above criteria shall not be applied to public lands.

e. *Seeding procedures*

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

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

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

f. *Site Protection*

The pad shall be fenced to BLM standards to exclude livestock grazing for the first two growing seasons or until seeded species are firmly established, whichever comes later. The seeded species will be considered firmly established when at least 50 percent of the new plants are producing seed. The BLM will approve the type of fencing.

g. *Mulch*

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

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

h. *Erosion Control*

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

i. *Monitoring*

The operator shall conduct annual monitoring surveys of all sites categorized as “operator reclamation in progress” and shall submit an annual monitoring report of these sites to the BLM by December 31 of each year. The 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.

11. As Built Details: The operator shall submit to the AO within 30 days of setting production facilities, a digital as-built file of the following: the perimeter of the pad collected at the base of fill slopes and at the head of cut slopes including all associated soil locations, the wellhead(s), and the centerline of the access road. The digital depiction shall be in a format that is GIS compatible (shapefiles) in NAD83, UTM coordinate system.
12. Weed Control: The operator shall regularly monitor and promptly control noxious weeds or other undesirable plant species as set forth in the joint BLM/ Forest Service *Noxious and Invasive Weed Management Plan for Oil and Gas Operators*, dated March 2007. A Pesticide Use Proposal (PUP) must be approved by the BLM prior to the use of herbicides. Annual weed monitoring reports shall be submitted to the AO by December 1.
13. Visual Resources: Facilities shall be placed as indicated on the plats attached to the APD, unless an alternative placement is approved by the BLM. All permanent structures installed on the location will be painted a flat non-reflective Shale Green, of the standard environmental colors.
14. Heritage Resources - Cultural and Paleontological: All persons in the area who are associated with this authorization shall be informed that any person who, without a permit, injures, destroys, excavates, appropriates or removes any vertebrate fossil, 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). Any heritage resource discovered requires that work in the area must stop and the BLM AO notified. Strict adherence to the confidentiality of information concerning the nature and location of archeological resources would be required of the proponent and all of their subcontractors (Archaeological Resource Protection Act, 16 U.S.C. 470hh).

Inadvertent Discovery:

The National Historic Preservation Act (NHPA) [16 USC 470s., 36 CFR §800.13], as amended, requires that if newly discovered historic or archaeological materials or other cultural resources are identified during the Proposed Action implementation, work in that area must stop and the BLM AO must be notified immediately. Within five working days the AO will determine the actions that will likely have to be completed before the site can be used, assuming in place preservation is not necessary §800.13(b)(3).

The Native American Graves Protection and Repatriation Act (NAGPRA) [25 USC 3001 et seq., 43 CFR 10.4] requires that if inadvertent discovery of Native American Human Remains or Objects of Cultural Patrimony occurs, any activity must cease in the area of discovery, a reasonable effort made to protect the item(s) discovered, and immediate notice be made to the BLM Authorized Officer (AO), as well as the appropriate Native American group(s) (IV.C.2). Notice may be followed by a 30-day delay (NAGPRA §3(d)).

The Paleontological Resources Preservation Act (PRPA) [16 U.S.C. 470aaa] requires the proponent to immediately suspend activities in the vicinity, protect the discovery from damage and notify the BLM AO of any paleontological resources discovered as a result of operations under this authorization. The AO will evaluate, or will have evaluated, such discoveries as soon as possible, but not later than 10 working days after being notified. Appropriate measures to mitigate adverse effects to significant paleontological resources will be determined by the AO after consulting with the operator. Within 10 days, the operator will be allowed to continue construction through the site, or will be given the choice of either (1) following the AO's instructions for stabilizing the fossil resource in place and avoiding further disturbance to the fossil resource, or (2) following the AO's instructions for mitigating impacts to the fossil resource prior to continuing construction through the project area.

If human remains are discovered on private or state land associated with this authorization, the BLM will notify the State of Colorado Archaeologist immediately, who will comply with Colorado Revised Statutes (Appendix) regarding the discovery of human remains (24-80-1302).

In the case of a new discovery, the operator may relocate activities to avoid the expense or mitigation and delays associated with this process, as long as the new area has been appropriately inventoried and has no resource concerns, and the exposed materials are recorded and stabilized. Otherwise, the operator shall be responsible for mitigation costs. The BLM AO will provide technical and procedural guidelines for relocation and/or to conduct mitigation. Upon verification from the BLM AO that the required mitigation has been completed, the operator will be allowed to resume construction.

15. Timing/Disturbance Limitations:

- a. *Migratory Birds.* To ensure compliance with the Migratory Bird Treaty Act, and pursuant to BLM Instruction Memorandum 2008-050, no new surface disturbance, especially vegetation removal, shall be allowed between May 15 and July 15, to prevent potential taking of migratory birds including birds of conservation concern. If initiation of construction, drilling, or completion activities during these dates

cannot be avoided, the operator is responsible for complying with the Migratory Bird Treaty Act, which prohibits the “take” of birds or active nests (those containing eggs or young), including nest failure caused by noise and human activity.

- b. *Bald and Golden Eagles.* It shall be the responsibility of the operator to comply with the Bald and Golden Eagle Protection Act (Eagle Act) with respect to “take” of either eagle species. Under the Eagle Act, “take” includes to pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest and disturb. “Disturb” means to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, (1) injury to an eagle; (2) a decrease in its productivity by substantially interfering with normal breeding, feeding, or sheltering behavior; or (3) nest abandonment by substantially interfering with normal breeding, feeding, or sheltering behavior. Avoidance of eagle nest sites, particularly during the nesting season, is the primary and preferred method to avoid a take. Any oil or gas construction, drilling, or completion activities planned within 0.5 mile of a bald or golden eagle nest, or other associated activities greater than 0.5 miles from a nest that may disturb eagles, should be coordinated with the BLM project lead and BLM wildlife biologist and the USFWS representative in the BLM Field Office (970-876-9051).

Surface Site-Specific Conditions of Approval

- 16. All machinery shall be cleaned to remove noxious weed seed that may be present from prior project locations.
- 17. Operator’s responsibility for noxious weed control shall be ongoing and shall continue even after final reclamation, until a minimum of one year has passed since either the last well was plugged and abandoned, or the termination of the Right of Way (ROW), as the case may be.
- 18. Reclamation shall be considered successful when basal cover of seeded species or other naturally recruited native species is at least 80 percent of basal cover on adjacent or nearby undisturbed areas where vegetation is in a healthy condition. Reclamation efforts shall be monitored by Encana and additional reclamation efforts shall be required until this objective is met.
- 19. The following seed mix will be utilized for interim and final reclamation, and must be certified as weed free in accordance with BLM requirements.

Species	Seeding Rate for Broadcast Application ¹
GRASSES	
Slender wheatgrass (<i>Elymus trachycaulus ssp. trachycaulus</i>), San Luis	8
Needle and thread grass (<i>Hesperostipa comata ssp. comata</i>)	4

Species	Seeding Rate for Broadcast Application ¹
Western wheatgrass (<i>Pascopyrum smithii</i>), Rosana	6
Indian ricegrass (<i>Achnatherum hymenoides</i>), Rimrock	4
Thickspike wheatgrass (<i>Elymus lanceolatus</i>), Critana	8
Total	28
Shrubs/FORBS²	
Scarlet globemallow (<i>Sphaeralcea coccinea</i>)	1
Shadscale (<i>Atriplex confertifolia</i>)	4
Total²	5

¹ Seeding rate is in pounds of pure live seed per acre

² Seed at a later date to allow for broad leaf herbicide treatments to control annual weeds

20. Per the lease stipulations, construction, reclamation, maintenance, and operations considered by the AO to be intensive in nature in deer and elk severe winter range and winter concentration areas shall not be allowed between December 1 and May 1, unless otherwise approved by the BLM AO.
21. To protect nesting raptors, a Timing Limitation (TL) shall be applied to construction activities within a 0.25 mile buffer of tree-nesting raptor nest structures, or a 0.5 mile buffer of cliff-nesting raptor nest structures, if the activities would be initiated during the species specific nesting period. An exception to this TL may be granted for any year in which subsequent survey determines one of the following: (a) the nest is in a severely dilapidated condition or has been destroyed due to natural causes, (b) the nest is not occupied during the normal nesting period for that species, (c) the nest was occupied but subsequently failed due to natural causes, or (d) the nest was occupied but the nestlings have fledged and dispersed from the nest. In the case of a dilapidated nest or one that has been destroyed due to natural causes, the TL shall apply to any alternate or replacement nest within the buffer widths specified above, unless an exception is granted for the alternate or replacement nest for one of the reasons listed. Dates for species currently identified are: Golden Eagle - December 15 to July 15, Red-tailed Hawk - February 15 to July 15 and Cooper's Hawk - April 1 to August 15.
22. To comply with the Migratory Bird Treaty Act, as much vegetation clearing as possible would be completed outside of the migratory bird nesting season. The migratory bird nesting season is generally May 15 to July 15 in the GJFO. If vegetation removal cannot be planned and accomplished prior to May 15, then exception to this condition may be granted to allow work on the project during the closure period.
23. Due to the proximity of the closest residence and other residences in Kimball and Roan Creek, COGCC noise regulations for Residential, rural and agricultural areas would apply (COGCC 2009). Should the nearby residence be vacant, the light industrial noise levels may

be applied. Noise level restrictions for both zones are shown in Table 3.4.6-1. COGCC rules state that in most cases sound level readings would take place at a distance of 350 feet from the noise source; however, under COGCC regulations, this distance can be modified to fit the circumstances. To ensure noise levels are in compliance with COGCC regulations, a monitor station/data logger would be temporarily installed between the well pad and residence, at a distance of 350 feet from the well pad. Records of the monitor station would be made available at the well pad and emailed to the BLM AO weekly. If noise levels exceed the maximum allowable, Encana would install temporary sound walls to reduce levels to meet the COGCC rules. Encana may elect to install sound walls in lieu of monitoring and avoid subsequent potential shutdown periods. Pursuant to COGCC regulations, if an adjacent landowner complains about noise from the activities at the well location, an onsite inspection by COGCC would occur, and additional noise measurements appropriate to the situation would take place.

**Table 3.4.6-1: Colorado Oil and Gas Conservation Commission
Noise Level Restrictions**

ZONE	7:00 am to next 7:00 pm	7:00 pm to next 7:00 am
Residential/Agricultural/Rural	55 db(A)	50 db(A)
Light Industrial	70 db(A)	65 b(A)

24. Encana would be required to obtain any necessary Transportation Permits from Garfield County for oversize or overweight vehicles.
25. If traffic is disrupted during construction then suitable traffic control measures would be implemented. Traffic control measures would include warning signs, barriers or flagmen unless otherwise approved by the AO.
26. The operator shall notify all existing ROW holders in the project area prior to beginning any surface disturbance or construction activities. The operator shall obtain an agreement with any existing ROW holders or other parties with authorized facilities that cross or are adjacent to those of the operator to assure that no damage to an existing ROW or authorized facility would occur. The agreement(s) shall be obtained prior to construction.
27. In order to reduce wildfire risks, Encana must stockpile and utilize vegetative slash to avoid concentrations of material, especially root balls and woody debris, as directed by the AO.
28. Welding, acetylene or other torch, with open flame, shall be operated in an area barren or cleared of all flammable materials and vegetation at least ten feet on all sides from equipment.
29. Internal combustion engines should be equipped with an approved spark arrestor.
30. Any wildfires started on BLM lands would be reported to UCR Grand Junction Dispatch immediately.

APPENDIX B – SURFACE USE PLAN OF OPERATIONS
ENCANA APD – P08 798

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
GRAND JUNCTION FIELD OFFICE

FINDING OF NO SIGNIFICANT IMPACT

**Cow Ridge P08 798 Well Pad
COC-65131**

DOI-BLM-CO-130 2011-0056-EA

Based on the analysis of potential environmental impacts contained in the attached environmental assessment (EA), and considering the significance criteria in 40 CFR 1508.27, I have determined that the Proposed Action will not have a significant effect on the human environment. An environmental impact statement is, therefore, not required.

BACKGROUND

The Bureau of Land Management prepared an Environmental Assessment which analyzed the effects of the Cow Ridge well pad, gas wells, and short access road on 6.4 acres of public land located approximately 13.6 miles north of DeBeque, Colorado. The EA was made available for a public review on December 15, 2011. No comments were received.

Intensity

I have considered the potential intensity/severity of the impacts anticipated from the Cow Ridge P08 798 Well Pad Project decision relative to each of the ten areas suggested for consideration by the CEQ. With regard to each of the following:

- 1. *Impacts that may be both beneficial and adverse.*** This project may have minor adverse and short term impacts to air, soils, water, vegetation, wildlife, visual, traffic, and range resources. However, these impacts would be limited primarily to the construction period and are not significant. This project will add marginally to the social changes already occurring in Garfield, Mesa, and Rio Blanco Counties, but not significantly.
- 2. *The degree to which the proposed action affects public health and safety.*** The Proposed Action is not expected to impact public health and safety. Encana will follow their contingency plan for health, safety and wildfires.
- 3. *Unique characteristics of the geographic area such as proximity of historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas.*** There are no significant impacts to cultural resources, riparian vegetation, parklands, prime farmlands, wetlands, or ecologically critical areas within the project area. There are no municipal water supplies, wild and scenic rivers, rivers found suitable for inclusion in the wild and scenic rivers system, designated Wildlands or Lands with Wilderness Characteristics in the project area.

4. ***The degree to which the effects on the quality of the human environment are likely to be highly controversial.*** The proposal is relatively nondisturbing in nature. The impacts of oil and gas activities are generally well known and documented in the academic and practicing communities. Therefore, the environmental effects are not likely to be controversial.
5. ***The degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks.*** Oil and gas activities have a long history in the region and pose no unique or unknown risks.
6. ***The degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration.*** This decision is like many that have previously been made and will continue to be made by BLM responsible officials regarding oil and gas exploration and development on public lands. The decision is within the scope of the Resource Management Plan and is not expected to establish a precedent for future actions. The decision does not represent a decision in principle about a future consideration.
7. ***Whether the action is related to other actions with individually insignificant, but cumulatively significant impacts.*** There are no significant cumulative effects on the environment, either when combined with the effects created by past and concurrent projects, or when combined with the effects from natural changes taking place in the environment or from reasonably foreseeable future projects.
8. ***The degree to which the action may adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historic resources.*** There would be no adverse impacts to the above resources. Consultation with the State Historic Preservation Office was conducted on May 4, 2011. No cultural resources eligible for the National Register of Historic Places were identified during subsequent surveys. The Standard Education/Discovery stipulations for cultural resource protection, as required by the NHPA (36 CFR 800.13), and the requirements of the Colorado State Statute (CRS 24-80-1301 *Historic, Prehistoric, and Archaeological Resources, and Unmarked Human Graves*), would protect any newly discovered cultural resources.
9. ***The degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act of 1973.*** With the exception of water depletion impacts on Endangered Colorado River fish, no impacts are expected to endangered or threatened species or their designated critical habitats. Water depletions that could affect Endangered Colorado River fish are covered under a 2008 programmatic Biological Opinion and this action will be in compliance with that document. Potential impacts to greater sage-grouse winter range are avoided by crucial big game winter range restrictions imposed by stipulation on lease COC-65131.
10. ***Whether the action threatens a violation of Federal, State, or local law or requirements imposed for the protection of the environment.*** This decision complies with other Federal, State, or local laws and requirements imposed for the protection of the environment.

FINDING OF NO SIGNIFICANT IMPACT

On the basis of the information contained in the EA, and all other information available to me, it is my determination that: 1) the implementation of the Proposed Action or alternatives will not have significant environmental impacts beyond those already addressed in the "Record of Decision and Resource Management Plan," (January 1987); (2) the Proposed Action is in conformance with the Resource Management Plan; and (3) the Proposed Action does not constitute a major federal action having a significant effect on the human environment. Therefore, an environmental impact statement or a supplement to the existing environmental impact statement is not necessary and will not be prepared.

This finding is based on my consideration of the Council on Environmental Quality's (CEQ) criteria for significance (40 CFR '1508.27), both with regard to the context and to the intensity of the impacts described in the EA.



Field Manager
Grand Junction Field Office



Date

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
GRAND JUNCTION FIELD OFFICE

DECISION RECORD

**Cow Ridge P08 798 Well Pad
COC-65131**

DOI-BLM-CO-130-2011-0056-EA

DECISION: It is my decision to authorize the Proposed Action as described in the attached Environmental Assessment (EA). The proposed well pad would include the construction of a proposed natural gas well pad, access road, and associated facilities on the pad. Two natural gas wells (CR04D-9 P08 798 and DH7A-4 P08 798) are proposed for the pad location. The proposed well pad and facilities would be located on public land.

This decision requires the applicant to follow all of the mitigation measures and monitoring requirements included in the EA and the committed mitigation included in their Surface Use Plan, as well as the attached Conditions of Approval.

Scoping, by posting this project on the Grand Junction Field Office (GJFO) NEPA website, was the primary mechanism used by the Bureau of Land Management (BLM) to initially identify issues. Interested parties such as potentially affected landowners permit holders, local governments and related agencies are notified of well proposals via U.S. Postal Service. Colorado Parks and Wildlife (CPW) and High Lonesome Ranch attended the on-site visit on April 21, 2011. Concerns expressed by adjacent landowners were associated with noise impacts, and night time lighting of the well location during drilling operations. Noise issues were mitigated through the use of existing Colorado Oil and Gas Conservation Commission (COGCC) regulations, and noise monitoring requirements. Mitigation for night time lighting was not determined to be necessary. Additionally, the proposed project was discussed at the BLM's National Environmental Policy Act (NEPA) review meeting held on December 5, 2011.

We have determined that the project will have no effect on federally listed species or designated critical habitat.

A Finding of No Significant Impact (FONSI) has been prepared and executed. Based on the analysis of potential environmental impacts contained in the attached environmental assessment, and considering the significance criteria in 40 CFR 1508.27, I have determined that the Proposed Action will not have a significant effect on the human environment. An environmental impact statement is, therefore, not required.

RATIONALE: I have considered the potential intensity/severity of the impacts anticipated from the Cow Ridge P08 798 Well Pad Project decision. Issues identified in the internal scoping were analyzed and mitigated as necessary. This project may have minor adverse and short term impacts to air, soils, water, wildlife, visual resources, transportation, and invasive species. However, with the incorporation of mitigating measures, these impacts would be limited

primarily to the construction/drilling period and are not significant. This project will add marginally to the social change already occurring in the Mesa, Garfield, and Rio Blanco County area. No significant cumulative impacts would occur.

As proposed with the design criteria and attached mitigation, there would be no effect on the current status or trends for the Public Land Health Standards. Other items considered are documented in the FONSI for the action.

MITIGATION MEASURES/MONITORING: Mitigation measures that are to be incorporated as stipulations for the Right-of-Way (ROW) grant are included as Attachment 2, Conditions of Approval.

PROTEST/APPEALS: This decision may be appealed to the Interior Board of Land Appeals, Office of the Secretary, in accordance with the regulations contained in 43 CFR, Part 4 and using Form 1842-1. If an appeal is taken, your notice of appeal must be filed in this office (2815 H Road, Grand Junction, Colorado) within 30 days from receipt of this decision. The appellant has the burden of showing that the decision appealed from is in error.

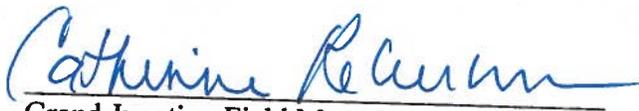
If you wish to file a petition (request) pursuant to regulation 43 CFR 2801.10 or 43 CFR 2881.10 for a stay (suspension) of the effectiveness of this decision during the time that your appeal is being reviewed by the Board, the petition for a stay must accompany your notice of appeal. A petition for a stay is required to show sufficient justification based on the standards listed below. Copies of the notice of appeal and petition for a stay must also be submitted to each party named in this decision and to the Interior Board of Land Appeals and to the appropriate Office of the Solicitor (see 43 CFR 4.413) at the same time the original documents are filed with this office. If you request a stay, you have the burden of proof to demonstrate that a stay should be granted.

NAME OF PREPARER: Cathy Ventling, Natural Resource Specialist

NAME OF ENVIRONMENTAL COORDINATOR: Collin Ewing

DATE: 2/7/12

SIGNATURE OF AUTHORIZED OFFICIAL:


Grand Junction Field Manager

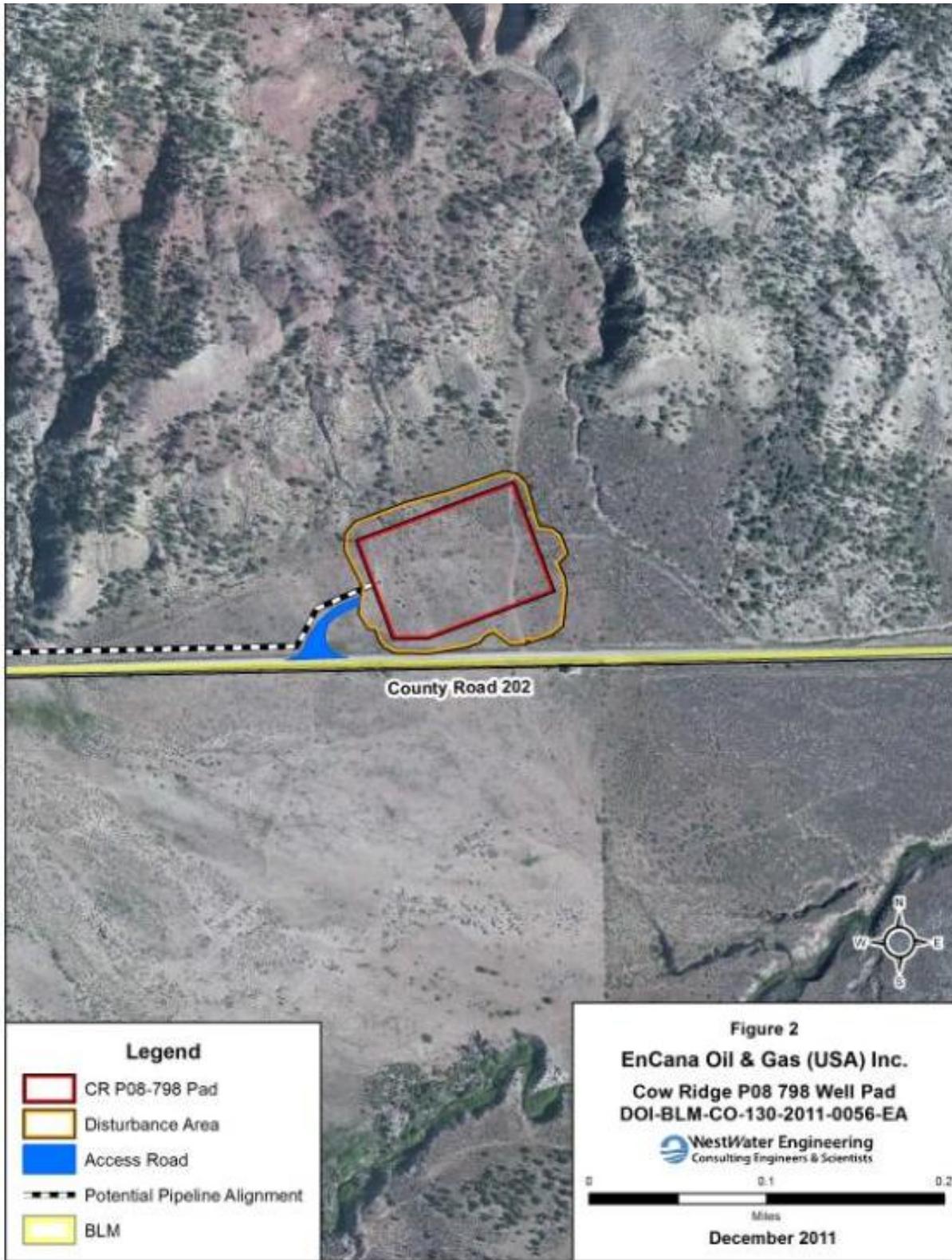
DATE SIGNED: 2/8/12

ATTACHMENTS:

- 1) Project Map
- 2) Conditions of Approval and Mitigating Measures

ATTACHMENT 1

Project Map



ATTACHMENT 2

Conditions of Approval

Drilling Conditions of Approval

1. Twenty-four hours *prior* to (a) spudding, (b) conducting BOPE tests, (c) cementing/running casing strings, and (d) within twenty-four hours *after* spudding, the Grand Junction Field Office (GJFO) shall be notified.
2. Contact this office for a verbal approval prior to commencing remedial work, plugging operations on newly drilled boreholes, changes within the drilling plan, sidetracks, changes or variances to the BOPE, deviating from conditions of approval, and conducting other operations not specified within the APD.
3. If a well control issue or failed test (e.g., kick, blowout, water flow, casing failure, or a bradenhead pressure increase) arises during drilling or completions operations, Bob Hartman 970-244-3041 (office) shall be notified within 24 hours from the time of the event. IADC/Driller's Logs and Pason Logs (mud logs) will be forwarded to the GJFO within 24 hours of a well control event.
4. The BOPE shall be tested and conform to Onshore Order No. 2 for a 5M system and recorded in the IADC/Driller's log. A casing head rated to 5,000 psi or greater shall be utilized.
5. On the first well drilled on this pad, a triple combo open-hole log shall be run from the base of the surface borehole to surface and from TD to bottom of surface casing shoe. This log shall be in submitted within 48 hours in .las and .pdf format to the GJFO.
6. Submit the (a) mud/drilling log (e.g., Pason disc), (b) driller's event log/operations summary report, (c) production test volumes, (d) directional survey, and (e) Pressure Integrity Test results within 30 days of completed operations (i.e., landing tubing) per 43 CRF 3160-9 (a).

Surface Standard Conditions of Approval

1. Administrative Requirements: The operator shall notify the BLM representative at least 48 hours prior to initiation of construction or reclamation activities. If requested by the BLM representative, the operator shall schedule a pre-construction meeting, including key operator and contractor personnel, to review all lease stipulations and conditions of approval (COAs), prior to initiation of surface disturbance.
2. Soils: Cuts and fills shall be minimized when working on erosive soils and slopes in excess of 30 percent. Cut-and-fill slopes shall be stabilized through revegetation practices with an approved seed mix shortly following construction activities to minimize the potential for slope failures and excessive erosion. Fill slopes adjacent to drainages shall be protected with well-anchored silt fences, straw wattles, or other acceptable BMPs designed to minimize the

potential for sediment transport. On slopes greater than 50 percent, BLM personnel may request a professional geotechnical analysis prior to construction.

3. Construction, Vegetation Removal, Topsoil Stripping and Storage: When saturated soil conditions exist on access roads or pads, construction shall be halted until soil material dries or thaws or until construction can proceed without soil damage. No topsoil shall be stripped when soils are saturated or frozen below the stripping depth. Prior to construction or pipeline installation, areas of such approved activities shall be cleared of trees, which shall be chipped or shredded in place, then salvaged and stored with topsoil. No stump left in place shall exceed six inches in height. Brushy vegetation may be windrowed before topsoil stripping and scattered on reclamation areas.

All topsoil shall be stripped following removal of vegetation during construction of well pads, pipelines, roads, or other surface facilities. In areas of thin soil, a minimum of the upper 6 inches of surface material shall be stripped. The BLM may specify a stripping depth during the onsite visit or based on subsequent information regarding soil thickness and suitability. The stripped topsoil shall be stored separately from subsoil or other excavated material and replaced prior to final seedbed preparation. The BLM best management practice (BMP) for the windrowing of topsoil shall be implemented for well pad construction whenever topography allows (refer to the BLM 2009 PowerPoint available upon request). Topsoil berms shall be seeded within 30 days to maintain soil microbe health, reduce erosion, and prevent weed establishment.

4. Road Construction and Maintenance: Roads shall be crowned, ditched, surfaced, drained with culverts and/or water dips, and constructed to BLM Gold Book (USDI, USDA 2007) standards. Initial gravel application shall be a minimum of 6 inches. The operator shall provide timely year-round road maintenance and cleanup on the access roads. A regular schedule for maintenance shall include, but not be limited to, blading, ditch and culvert cleaning, road surface replacement, and dust abatement. When rutting within the traveled way becomes greater than 6 inches, blading and/or gravelling shall be conducted as approved by the BLM. Ditches shall be allowed to vegetate and/or shall include large rocks or stones to slow the velocity of drainage and allow sediment to settle out. Ditches may be seeded where soils are erodible.
5. Dust Abatement: The operator shall prevent and abate fugitive dust as needed. The BLM may direct the operator to change the level and type of treatment if dust abatement is insufficient. BLM approval is required before application of surfactants, binding agents, or other dust-suppression chemicals on roadways within public lands. Speed control measures on all project-related unpaved roads shall also be required.
6. Jurisdictional Waters of the U.S.: The operator shall obtain appropriate permits from the U.S. Army Corps of Engineers (USACE) prior to discharging fill material into waters of the U.S. in accordance with Section 404 of the Clean Water Act. Waters of the U.S. are defined in 33 CFR Section 328.3 and may include wetlands as well as perennial, intermittent, and ephemeral streams. Permanent impacts to waters of the U.S. may require mitigation. Contact the USACE Colorado West Regulatory Branch at 970-243-1199. Copies of any printed or emailed approved USACE permits or verification letters shall be forwarded to the BLM.

7. 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. Culverts at drainage crossings shall be designed and installed to pass a 25-year or greater storm event. The minimum culvert diameter in any installation for a drainage crossing or road drainage shall be 24 inches. Crossings of drainages deemed to be jurisdictional waters of the U.S. pursuant to Section 404 of the Clean Water Act may require additional culvert design capacity. Due to the flashy nature of area drainages and anticipated culvert maintenance, the USACE recommends designing drainage crossings for the 100-year event. Contact the USACE Colorado West Regulatory Branch at 970-243-1199.
8. Water Protection: Where roads cross ditches or drainages, culverts shall be sized to prevent obstruction to the free flow of the volumes of water being carried, inclusive of flood stages. Operator shall protect all water sources and conveyance structures including, but not limited to, wells, ditches, ponds, and the natural flow of creeks from all operational activities, and shall immediately remedy any diversion, curtailment or blockage of water flows or contamination of water sources caused by Operator activities.
9. Range Management: Damage to range improvements (fences, gates, reservoirs, pipelines, etc.) shall be avoided during development of oil and gas resources. If range improvements are damaged during exploration and development, the operator shall repair or replace the damaged range improvements. If a new or improved access road bisects an existing livestock fence, a steel frame gate or a cattle guard with bypass gate shall be installed across the roadway to control grazing livestock.
10. Reclamation: Prior to interim reclamation, the operator shall meet with BLM to inspect the disturbed area, review the existing reclamation plan, and agree upon any revisions to the plan. The objectives of interim reclamation are to return the disturbed area to productive use and meet the objectives of the land and the resource management plan. Interim reclamation will be considered successful when disturbed areas not needed for long-term production operations or vehicle travel have been recontoured and stabilized; revegetated with a self-sustaining, vigorous, diverse, native (or otherwise approved) plant community that minimizes visual impacts, provides forage and stabilizes soils. Seeded species will be considered firmly established when at least 50 percent of the new perennial plants are producing seed.
 - a. *Deadline for interim reclamation earthwork and seeding*

Interim reclamation to reduce a well pad to the maximum size needed for production, including earthwork and seeding of the interim reclaimed areas, shall be completed within 6 months following completion of the last well planned on that pad. Deadline is subject to extension on a case-by-case basis upon approval of the BLM, based on season, timing limitations, or other constraints. If an extension is needed, a request shall be submitted writing to the BLM. If an extension is granted, temporary surface stabilization (hydro-mulch, erosion matting, etc.) may be required.
 - b. During interim reclamation, slopes would be re-contoured to minimize areas that exceed a 3:1 slope. Any areas exceeding the 3:1 slope criteria or with high walls shall be reclaimed using enhanced stabilization and erosion prevention methods.

c. *Seedbed preparation*

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. The BLM may also require soil amendments if topsoil is inadequate. Final seedbed preparation shall consist of scarifying (raking or harrowing) or roughening the spread topsoil prior to seeding.

d. *Seed Mixes*

All disturbed areas shall be seeded with a seed mixture approved by the BLM and be consistent with BLM standards in terms of species and seeding rate for the specific habitat type within the project area. 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 tags or other official documentation shall be submitted to BLM at least 14 days before the date of proposed seeding for acceptance. Seed that does not meet the above criteria shall not be applied to public lands.

e. *Seeding procedures*

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

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

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

f. *Site Protection*

The pad shall be fenced to BLM standards to exclude livestock grazing for the first two growing seasons or until seeded species are firmly established, whichever comes later. The seeded species will be considered firmly established when at least 50 percent of the new plants are producing seed. The BLM will approve the type of fencing.

g. *Mulch*

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

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

h. *Erosion Control*

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

i. *Monitoring*

The operator shall conduct annual monitoring surveys of all sites categorized as “operator reclamation in progress” and shall submit an annual monitoring report of these sites to the BLM by December 31 of each year. The 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.

11. As Built Details: The operator shall submit to the AO within 30 days of setting production facilities, a digital as-built file of the following: the perimeter of the pad collected at the base of fill slopes and at the head of cut slopes including all associated soil locations, the wellhead(s), and the centerline of the access road. The digital depiction shall be in a format that is GIS compatible (shapefiles) in NAD83, UTM coordinate system.
12. Weed Control: The operator shall regularly monitor and promptly control noxious weeds or other undesirable plant species as set forth in the joint BLM/ Forest Service *Noxious and Invasive Weed Management Plan for Oil and Gas Operators*, dated March 2007. A Pesticide Use Proposal (PUP) must be approved by the BLM prior to the use of herbicides. Annual weed monitoring reports shall be submitted to the AO by December 1.
13. Visual Resources: Facilities shall be placed as indicated on the plats attached to the APD, unless an alternative placement is approved by the BLM. All permanent structures installed on the location will be painted a flat non-reflective Shale Green, of the standard environmental colors.
14. Heritage Resources - Cultural and Paleontological: All persons in the area who are associated with this authorization shall be informed that any person who, without a permit, injures, destroys, excavates, appropriates or removes any vertebrate fossil, 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). Any heritage resource discovered requires that work in the area must stop and the BLM AO notified. Strict adherence to the confidentiality of information concerning the nature and location of archeological resources would be required of the proponent and all of their subcontractors (Archaeological Resource Protection Act, 16 U.S.C. 470hh).

Inadvertent Discovery:

The National Historic Preservation Act (NHPA) [16 USC 470s., 36 CFR §800.13], as amended, requires that if newly discovered historic or archaeological materials or other cultural resources are identified during the Proposed Action implementation, work in that area must stop and the BLM AO must be notified immediately. Within five working days the AO will determine the actions that will likely have to be completed before the site can be used, assuming in place preservation is not necessary §800.13(b)(3).

The Native American Graves Protection and Repatriation Act (NAGPRA) [25 USC 3001 et seq., 43 CFR 10.4] requires that if inadvertent discovery of Native American Human Remains or Objects of Cultural Patrimony occurs, any activity must cease in the area of discovery, a reasonable effort made to protect the item(s) discovered, and immediate notice be made to the BLM Authorized Officer (AO), as well as the appropriate Native American group(s) (IV.C.2). Notice may be followed by a 30-day delay (NAGPRA §3(d)).

The Paleontological Resources Preservation Act (PRPA) [16 U.S.C. 470aaa] requires the proponent to immediately suspend activities in the vicinity, protect the discovery from damage and notify the BLM AO of any paleontological resources discovered as a result of operations under this authorization. The AO will evaluate, or will have evaluated, such discoveries as soon as possible, but not later than 10 working days after being notified. Appropriate measures to mitigate adverse effects to significant paleontological resources will be determined by the AO after consulting with the operator. Within 10 days, the operator will be allowed to continue construction through the site, or will be given the choice of either (1) following the AO's instructions for stabilizing the fossil resource in place and avoiding further disturbance to the fossil resource, or (2) following the AO's instructions for mitigating impacts to the fossil resource prior to continuing construction through the project area.

If human remains are discovered on private or state land associated with this authorization, the BLM will notify the State of Colorado Archaeologist immediately, who will comply with Colorado Revised Statutes (Appendix) regarding the discovery of human remains (24-80-1302).

In the case of a new discovery, the operator may relocate activities to avoid the expense or mitigation and delays associated with this process, as long as the new area has been appropriately inventoried and has no resource concerns, and the exposed materials are recorded and stabilized. Otherwise, the operator shall be responsible for mitigation costs. The BLM AO will provide technical and procedural guidelines for relocation and/or to conduct mitigation. Upon verification from the BLM AO that the required mitigation has been completed, the operator will be allowed to resume construction.

15. Timing/Disturbance Limitations:

- a. *Migratory Birds.* To ensure compliance with the Migratory Bird Treaty Act, and pursuant to BLM Instruction Memorandum 2008-050, no new surface disturbance, especially vegetation removal, shall be allowed between May 15 and July 15, to prevent potential taking of migratory birds including birds of conservation concern. If initiation of construction, drilling, or completion activities during these dates

cannot be avoided, the operator is responsible for complying with the Migratory Bird Treaty Act, which prohibits the “take” of birds or active nests (those containing eggs or young), including nest failure caused by noise and human activity.

- b. *Bald and Golden Eagles.* It shall be the responsibility of the operator to comply with the Bald and Golden Eagle Protection Act (Eagle Act) with respect to “take” of either eagle species. Under the Eagle Act, “take” includes to pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest and disturb. “Disturb” means to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, (1) injury to an eagle; (2) a decrease in its productivity by substantially interfering with normal breeding, feeding, or sheltering behavior; or (3) nest abandonment by substantially interfering with normal breeding, feeding, or sheltering behavior. Avoidance of eagle nest sites, particularly during the nesting season, is the primary and preferred method to avoid a take. Any oil or gas construction, drilling, or completion activities planned within 0.5 mile of a bald or golden eagle nest, or other associated activities greater than 0.5 miles from a nest that may disturb eagles, should be coordinated with the BLM project lead and BLM wildlife biologist and the USFWS representative in the BLM Field Office (970-876-9051).

Surface Site-Specific Conditions of Approval

- 16. All machinery shall be cleaned to remove noxious weed seed that may be present from prior project locations.
- 17. Operator’s responsibility for noxious weed control shall be ongoing and shall continue even after final reclamation, until a minimum of one year has passed since either the last well was plugged and abandoned, or the termination of the Right of Way (ROW), as the case may be.
- 18. Reclamation shall be considered successful when basal cover of seeded species or other naturally recruited native species is at least 80 percent of basal cover on adjacent or nearby undisturbed areas where vegetation is in a healthy condition. Reclamation efforts shall be monitored by Encana and additional reclamation efforts shall be required until this objective is met.
- 19. The following seed mix will be utilized for interim and final reclamation, and must be certified as weed free in accordance with BLM requirements.

Species	Seeding Rate for Broadcast Application ¹
GRASSES	
Slender wheatgrass (<i>Elymus trachycaulus ssp. trachycaulus</i>), San Luis	8
Needle and thread grass (<i>Hesperostipa comata ssp. comata</i>)	4

Species	Seeding Rate for Broadcast Application ¹
Western wheatgrass (<i>Pascopyrum smithii</i>), Rosana	6
Indian ricegrass (<i>Achnatherum hymenoides</i>), Rimrock	4
Thickspike wheatgrass (<i>Elymus lanceolatus</i>), Critana	8
Total	28
Shrubs/FORBS²	
Scarlet globemallow (<i>Sphaeralcea coccinea</i>)	1
Shadscale (<i>Atriplex confertifolia</i>)	4
Total²	5

¹ Seeding rate is in pounds of pure live seed per acre

² Seed at a later date to allow for broad leaf herbicide treatments to control annual weeds

20. Per the lease stipulations, construction, reclamation, maintenance, and operations considered by the AO to be intensive in nature in deer and elk severe winter range and winter concentration areas shall not be allowed between December 1 and May 1, unless otherwise approved by the BLM AO.
21. To protect nesting raptors, a Timing Limitation (TL) shall be applied to construction activities within a 0.25 mile buffer of tree-nesting raptor nest structures, or a 0.5 mile buffer of cliff-nesting raptor nest structures, if the activities would be initiated during the species specific nesting period. An exception to this TL may be granted for any year in which subsequent survey determines one of the following: (a) the nest is in a severely dilapidated condition or has been destroyed due to natural causes, (b) the nest is not occupied during the normal nesting period for that species, (c) the nest was occupied but subsequently failed due to natural causes, or (d) the nest was occupied but the nestlings have fledged and dispersed from the nest. In the case of a dilapidated nest or one that has been destroyed due to natural causes, the TL shall apply to any alternate or replacement nest within the buffer widths specified above, unless an exception is granted for the alternate or replacement nest for one of the reasons listed. Dates for species currently identified are: Golden Eagle - December 15 to July 15, Red-tailed Hawk - February 15 to July 15 and Cooper's Hawk - April 1 to August 15.
22. To comply with the Migratory Bird Treaty Act, as much vegetation clearing as possible would be completed outside of the migratory bird nesting season. The migratory bird nesting season is generally May 15 to July 15 in the GJFO. If vegetation removal cannot be planned and accomplished prior to May 15, then exception to this condition may be granted to allow work on the project during the closure period.
23. Due to the proximity of the closest residence and other residences in Kimball and Roan Creek, COGCC noise regulations for Residential, rural and agricultural areas would apply (COGCC 2009). Should the nearby residence be vacant, the light industrial noise levels may

be applied. Noise level restrictions for both zones are shown in Table 3.4.6-1. COGCC rules state that in most cases sound level readings would take place at a distance of 350 feet from the noise source; however, under COGCC regulations, this distance can be modified to fit the circumstances. To ensure noise levels are in compliance with COGCC regulations, a monitor station/data logger would be temporarily installed between the well pad and residence, at a distance of 350 feet from the well pad. Records of the monitor station would be made available at the well pad and emailed to the BLM AO weekly. If noise levels exceed the maximum allowable, Encana would install temporary sound walls to reduce levels to meet the COGCC rules. Encana may elect to install sound walls in lieu of monitoring and avoid subsequent potential shutdown periods. Pursuant to COGCC regulations, if an adjacent landowner complains about noise from the activities at the well location, an onsite inspection by COGCC would occur, and additional noise measurements appropriate to the situation would take place.

**Colorado Oil and Gas Conservation Commission
Noise Level Restrictions**

ZONE	7:00 am to next 7:00 pm	7:00 pm to next 7:00 am
Residential/Agricultural/Rural	55 db(A)	50 db(A)
Light Industrial	70 db(A)	65 b(A)

24. Encana would be required to obtain any necessary Transportation Permits from Garfield County for oversize or overweight vehicles.
25. If traffic is disrupted during construction then suitable traffic control measures would be implemented. Traffic control measures would include warning signs, barriers or flagmen unless otherwise approved by the AO.
26. The operator shall notify all existing ROW holders in the project area prior to beginning any surface disturbance or construction activities. The operator shall obtain an agreement with any existing ROW holders or other parties with authorized facilities that cross or are adjacent to those of the operator to assure that no damage to an existing ROW or authorized facility would occur. The agreement(s) shall be obtained prior to construction.
27. In order to reduce wildfire risks, Encana must stockpile and utilize vegetative slash to avoid concentrations of material, especially root balls and woody debris, as directed by the AO.
28. Welding, acetylene or other torch, with open flame, shall be operated in an area barren or cleared of all flammable materials and vegetation at least ten feet on all sides from equipment.
29. Internal combustion engines should be equipped with an approved spark arrestor.
30. Any wildfires started on BLM lands would be reported to UCR Grand Junction Dispatch immediately.