

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

# ENVIRONMENTAL ASSESSMENT

**NUMBER:** DOI-BLM-CO-N040-2009-0102

**CASEFILE NUMBER:** Federal Lease COC54737

**PROJECT NAME:** Proposal to Drill Seven Wells from Proposed L26NW Pad Located on BLM Land in Grass Mesa Area South of Rifle.

**LOCATION:** Township 6 South, Range 93 West, Section 26, NW<sup>1</sup>/<sub>4</sub>SW<sup>1</sup>/<sub>4</sub>, Sixth P. M. (see Figure 1).

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

<b>Table 1. Surface and Bottomhole Locations of Proposed Wells</b>		
<i>Proposed Wells</i>	<i>Surface Locations (Section 26, T6S, R93W)</i>	<i>Bottomhole Locations</i>
GMU 26-12A2 (L26NW)	NW <sup>1</sup> / <sub>4</sub> SW <sup>1</sup> / <sub>4</sub> , 1488 ft FSL 274 ft FWL	SW <sup>1</sup> / <sub>4</sub> NW <sup>1</sup> / <sub>4</sub> , 2615 ft FNL 1030 ft FWL
GMU 27-9A (L26NW)	NW <sup>1</sup> / <sub>4</sub> SW <sup>1</sup> / <sub>4</sub> , 1496 ft FSL 264 ft FWL	NE <sup>1</sup> / <sub>4</sub> SE <sup>1</sup> / <sub>4</sub> , 2060 ft FSL 115 ft FEL
GMU 27-9C (L26NW)	NW <sup>1</sup> / <sub>4</sub> SW <sup>1</sup> / <sub>4</sub> , 1488 ft FSL 214 ft FWL	NE <sup>1</sup> / <sub>4</sub> SE <sup>1</sup> / <sub>4</sub> , 1545 ft FSL 820 ft FEL
GMU 27-9D1 (L26NW)	NW <sup>1</sup> / <sub>4</sub> SW <sup>1</sup> / <sub>4</sub> , 1496 ft FSL 244 ft FWL	NE <sup>1</sup> / <sub>4</sub> SE <sup>1</sup> / <sub>4</sub> , 1935 ft FSL 370 ft FEL
GMU 27-9D2 (L26NW)	NW <sup>1</sup> / <sub>4</sub> SW <sup>1</sup> / <sub>4</sub> , 1488 ft FSL 234 ft FWL	NE <sup>1</sup> / <sub>4</sub> SE <sup>1</sup> / <sub>4</sub> , 1440 ft FSL 190 ft FEL
GMU Fee 27-10D2 (L26NW)	NW <sup>1</sup> / <sub>4</sub> SW <sup>1</sup> / <sub>4</sub> , 1496 ft FSL 224 ft FWL	N/A
GMU Fee 27-16A (L26NW)	NW <sup>1</sup> / <sub>4</sub> SW <sup>1</sup> / <sub>4</sub> , 1488 ft FSL 254 ft FWL	N/A

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

## **ISSUES AND CONCERNS**

### **Grass Mesa Homeowner Association Comments**

The following issues and comments were received from interested parties, including Grass Mesa Homeowner Association (GMHOA) residents as part of a questionnaire solicited by EnCana in October 2008 regarding the residents' preference for a particular route to serve the proposed L26NW pad. The questionnaire gave residents a choice of two access routes for the L26NW pad. A copy of the questionnaire including a map of two road alternatives is provided in Appendix A. The purple route represents Option A and the blue route Option B in the questionnaire.

- *Who will enforce or police the traffic use at the intersection of the GMHOA Road and L26NW access road?*
- *What is to keep the EnCana employees and subcontractors from merely turning right down the GMHOA Road from the L26NW intersection for the relatively short 1¼ mile trip to CR319 instead of following the required EnCana traffic route which would cover some 8 miles using the GMBLM [Grass Mesa BLM] Road to reach the same point on CR319?*
- *The route being proposed from the valley floor to L26NW pad generally parallels and follows above the GMHOA Road creating a real exposure to potential safety hazards during construction and throughout the life of that road.*
- *The potential for injury or death from vehicles of heavy tonnage meeting with small family vehicles at the proposed L26NW intersection with GMHOA Road simply should not be tolerated.*
- *With the potential frac and/or workover operations that could occur on the planned wells for the L26NW pad, there could easily be heavy truck traffic on the proposed L26NW road that goes well beyond the initial drilling and completion work planned.*
- *Need more details on the traffic control plan for the L26NW-GMHOA Road intersection. Mechanical operation for traffic safety at the proposed intersection is unacceptable. Manned positions for traffic control have proved unreliable in the past.*
- *There is a unique problem of financial liability and enforcement for accidents that may occur with this proposal. City of Rifle police are not in jurisdiction for Grass Mesa, and Garfield County Sheriff doesn't readily respond.*
- *Is it possible to organize the shift periods for EnCana's drilling and completion subcontractors so that the shift traffic does not directly conflict with HOA traffic (avoid 6-9am and 5-8pm periods)?*
- *Would rather see EnCana use existing roads, maintain them, and leave the undisturbed areas of the BLM for wildlife.*
- *There is too much rig traffic on the roads through Grass Mesa. When will EnCana leave us alone? Don't want more EnCana traffic on our road.*
- *Option B appears to be the least impact on GMHOA Road. Both options are not good due to the environmental concerns of new roads paralleling existing roads. Looks like the best environmental road would be through the Anderson lot.*
- *Would prefer Option B because it protects the disturbance of the ravine.*
- *I don't like either choice. I was run off the road when semis use to share GMHOA Road and I almost died. If you wanted to use small vehicles, I would be in favor. No semi-trucks or water trucks. It was way too dangerous and scary.*
- *It would have been nice if the HOA had a vote in if the road would even be built. A large herd of elk spend a great deal of time down in the valley during the winter and no one cares.*
- *A proposal to use the upper portion of the GMHOA Road down to the proposed L26NW road segment east of the GMHOA Road would create unmanageable and unsafe traffic risks since the route would be shared by HOA residents and EnCana traffic for about 0.8 miles. Furthermore, there is no control regarding the amount or volume of truck traffic that might be on the existing GMHOA Road. Lastly, the increased traffic loads from the heavy trucks has a degrading impact particularly on the steeper slope of the GMHOA Road.*

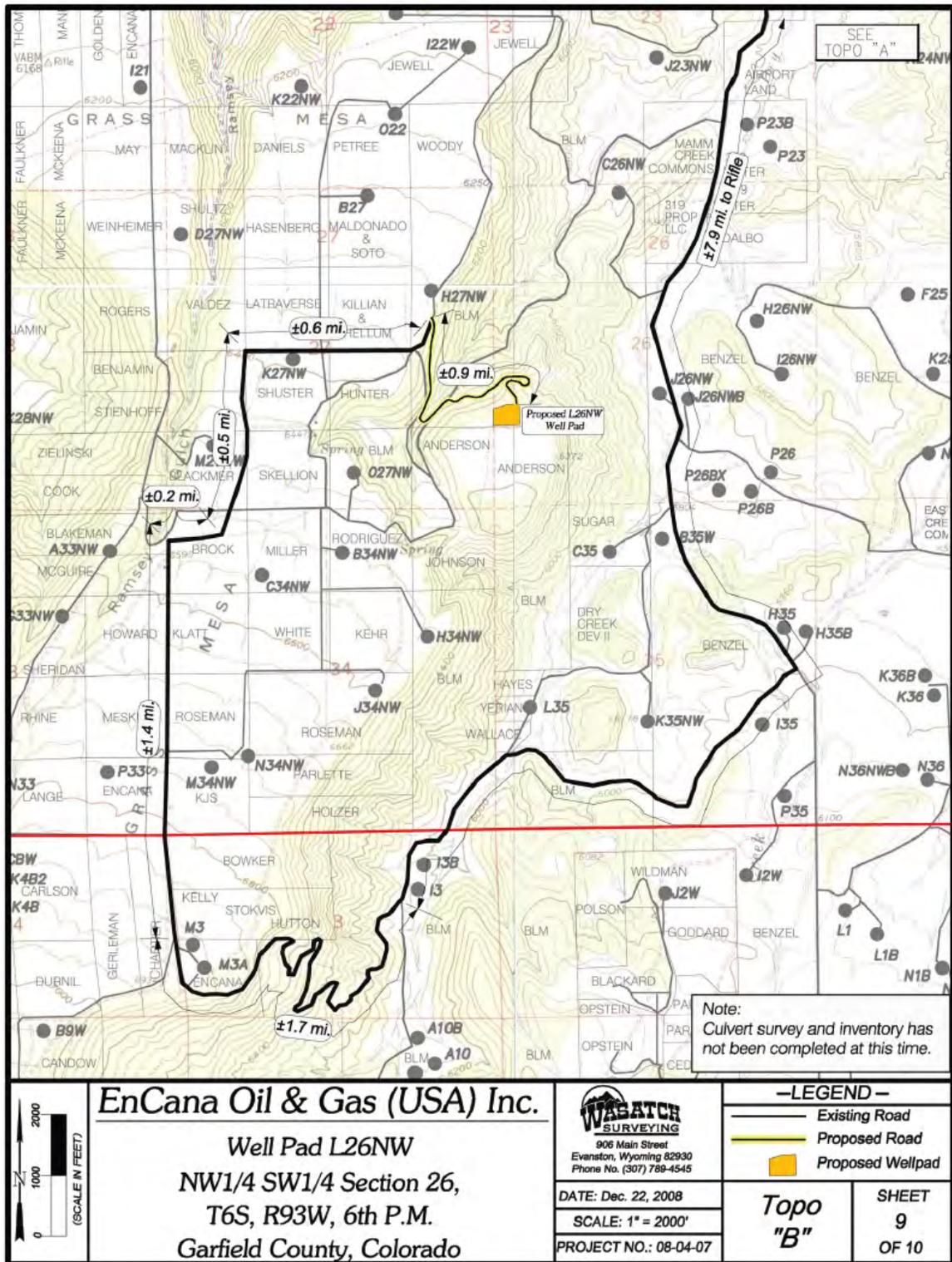


Figure 1. Proposed Action – L26NW pad and access road from the existing H27NW pad crossing of the GMHOA Road.

### **Grass Mesa HOA Board of Directors Input**

In addition to the response to the EnCana questionnaire in October 2008, a meeting was held between the GMHOA Board of Directors and representatives of BLM and EnCana on August 18, 2009. During that meeting, BLM representatives explained the two routes being considered—Proposed Action and Alternative Route—to the Board. They acknowledged the general components of the routes and indicated they would submit written input to BLM by September 1, 2009.

A letter (dated 8/27/09) was received from GMHOA Board President Mike McGuire indicating that the Proposed Action route crossing the GMHOA Road “creates a severe safety issue for the residents and guests of Grass Mesa. In addition, the Board is very concerned about the detrimental effects to the environment and wildlife and hunting impacts, as well as the resulting aesthetics. The Grass Mesa residents have endured years of impacts from drilling operations and continue to be critically impacted. The Board feels that this project will further destroy this beautiful area and will detrimentally impact Grass Mesa property values.” The Board also questioned the economic viability of drilling the L26NW pad with six [actually seven] holes, stating, “We strongly feel that EnCana has an unforeseen hidden agenda with regard to the building of this road, and our past experiences with EnCana have produced negative consequences whether intended or not.” In his closing remarks, Mr. McGuire stated that the Board “strongly opposes any proposal by EnCana or the BLM to cross Grass Mesa Road at any point. We deeply appreciate the BLM’s consideration of the continual and potential adverse impacts to the Grass Mesa homeowners, wildlife, and the environment.”

### **PROPOSED ACTION**

#### **EnCana’s Requested Alignment**

The Proposed Action submitted by EnCana is to directionally drill five Federal wells and two Fee (private) wells from the proposed L26NW Pad located on BLM land on Grass Mesa about three miles southeast of Rifle, Colorado. The Federal wells would be directionally drilled from this location into the underlying Federal mineral estate cited above; the Fee wells would be authorized under state well permits issued by the Colorado Oil and Gas Conservation Commission (COGCC). Aside from approval of Applications for Permit to Drill (APDs) for the five Federal wells, the BLM would also make a decision to approve EnCana’s right to occupy the BLM surface to drill the two Fee wells via Sundry Notice. The proposed wells would lie within the Grass Mesa Federal Unit operated by EnCana.

The Grass Mesa Geographic Area Plan (GMGAP) was previously analyzed and approved by the BLM in November 2004. Although neither the L26NW pad nor its associated developments were specifically analyzed in the GMGAP, the proposed pad is intended to serve as a substitute surface location for some of the bottomhole locations originally proposed for the O27NW pad. The O27NW pad was not approved in the GMGAP in order to protect important resource values identified in the vicinity of that location. In fall 2007, EnCana requested a temporary 2-year modification to the lease terms for the Big Game Winter Habitat Timing Limitation for the Federal leases located on Grass Mesa. This request was approved in fall 2007 by BLM, effectively allowing the drilling or completion activities to continue unabated on Grass Mesa Federal leases through November 30, 2010. The L26NW pad was included in the list of pads scheduled for the year-round drilling (labeled I27NW pad in the request letter).

The project area is accessed from I-70 exit 90 at Rifle, along Airport Road in South Rifle to Garfield County Road 319 (CR319) (Figure 1). Approximately 3 miles south on CR319, gasfield vehicles would use the Grass Mesa BLM (GMBLM) Road to climb onto the south end of Grass Mesa, then traverse back across the mesa on private roads to access the H27NW pad constructed on BLM land in

2008. From the H27NW pad, a new road (0.9 mile in length) would be constructed on BLM land, crossing the GMHOA Road and climbing back onto the eastern edge of Grass Mesa at the L26NW pad.

Project components (well pad, road, and pipeline) (see Figure 2) would be located in a woodland of Utah juniper (*Juniperus osteosperma*), with a few mature pinyon pines (*Pinus edulis*) scattered throughout the project area. The proposed L26NW road would cross an unnamed ephemeral drainage in a ravine just west and south of the proposed GMHOA Road intersection.

EnCana or its contractors would not be allowed to use the GMHOA Road other than to cross at the proposed intersection with the L26NW access road. HOA residents would not be allowed to use the new L26NW road, thus avoiding conflicts with expected truck traffic associated with the development and operation of the L26NW pad. As has been the case since the GMHOA Road was built, the general public would not have motorized access to Grass Mesa or the proposed L26NW pad.

The L26NW pad is located entirely on BLM land, although it lies approximately 1,250 feet from the Anderson residence. The pad, to be constructed in sagebrush habitat with juniper and pinyon trees along the edges, would have a maximum cut of 8.2 feet at the center south edge of pad and a maximum fill of 10.4 feet at the northeastern pad corner (see Figure 3). Construction of the well pad would result in approximately 4.8 acres of new surface disturbance, which would be reduced to approximately 1.2 acres after interim reclamation. The juniper trees cleared during the pad construction would be windrowed at the toe of the fillslope to serve as a sediment barrier; pinyon trees would be cut and removed from the site to avoid infestation by the pinyon *Ips* beetle.

The new access road (4,700 feet long with a travelway 18 feet wide) would be constructed to the L26NW pad from the existing field development road near the H27NW pad. The road would be constructed based on the stamped, engineered road design package prepared and submitted by River City Consultants, Grand Junction, Colorado. The design package details a series of culvert locations to maintain proper road drainage and inter-visible turnouts to allow for safe passage of vehicles. The construction, maintenance, and reclamation of the road would adhere to the Best Management Practices outlined in BLM's Gold Book, *Surface Operating Standards for Oil and Gas Exploration & Development* (BLM2006b). Limits of disturbance would be staked on the ground prior to beginning road construction.

During pioneering of the roadway, trees that are cleared and grubbed would be broken down with excavation equipment and placed along the toe of the fillslope in a windrow to act as a sediment filter; straw wattles would be placed along the outside edge of the disturbance areas to catch any residual sediment. The cutslopes on the road would be step-terraced with some terrace widths designed to allow the placement of cleared trees for visual mitigation. Ditch flows into culverts would be controlled with aggregate check dams, sediment traps, and erosion control wattles; culvert outlets would be protected with riprap or erosion control mats. Disturbed areas, including road slopes, would be covered with seed tacked straw and erosion control mulch or blankets. The average disturbance width for the proposed road would be 60 feet. Total short-term disturbance associated with road construction would amount to 6.5 acres. Total long-term disturbance (essentially the road travelway) would be 2.2 acres.

Where the L26NW road would cross the GMHOA Road, EnCana would implement a traffic control plan to mitigate traffic conflicts between the GMHOA Road users and gasfield traffic supporting the L26NW pad (see Appendix C). This would include widening the GMHOA Road at the intersection to accommodate passage of vehicles in both directions. Traffic control personnel would housed in a temporary building to operate a traffic signal placed at the intersection 24 hours per day, 7 days per week during the construction, drilling, completion, and interim reclamation phases of the project.

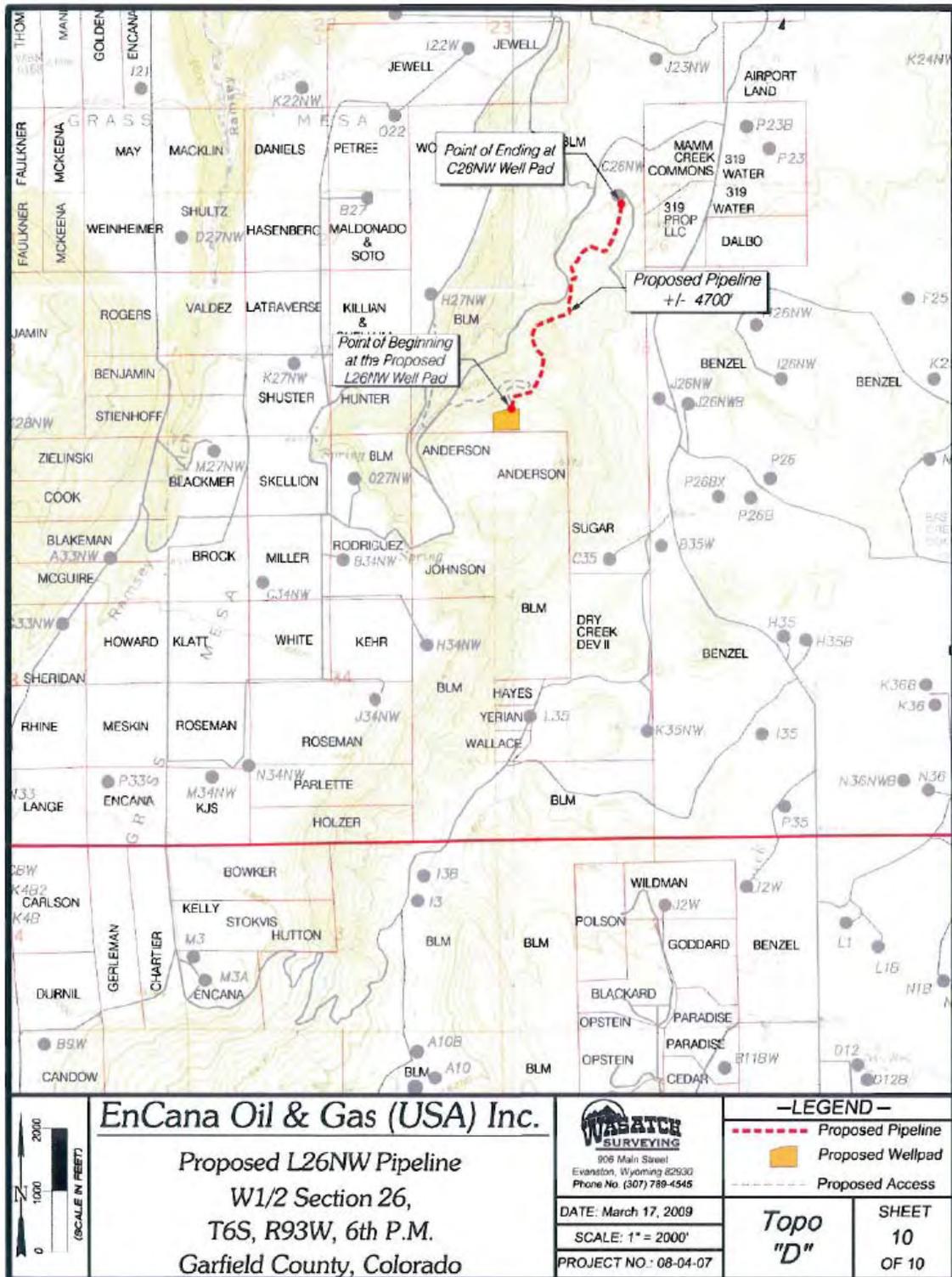


Figure 2. Proposed Action showing the proposed L26NW Pipeline to be constructed to the existing C26NW pad

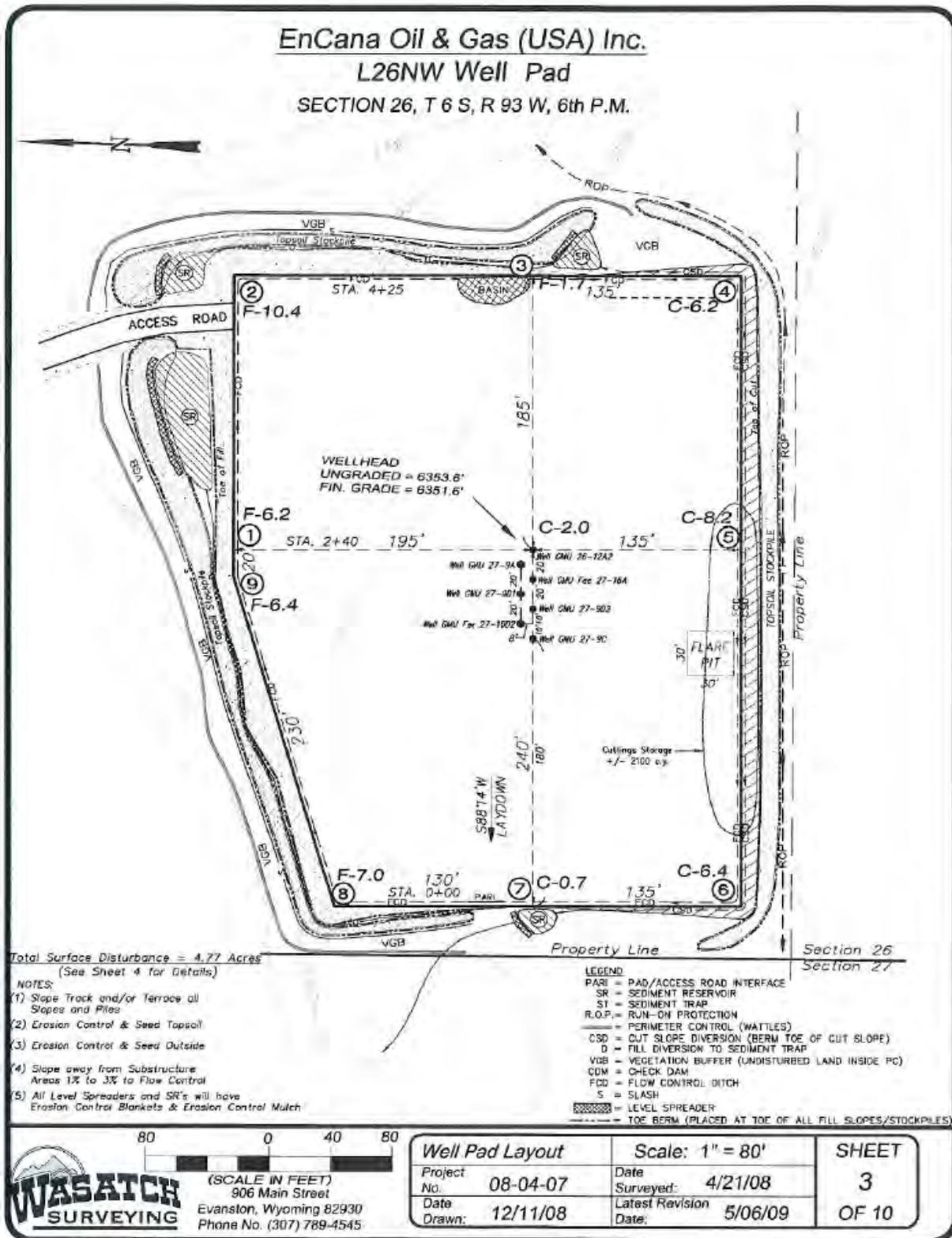


Figure 3. L26NW Pad layout.

Neither the traffic control personnel nor the traffic signal would be available or used during the production phase of the wells on the L26NW pad (estimated 30 years). During periods where workover rig or maintenance operations are needed at the pad, flaggers would be used to handle traffic control at the GMHOA intersection. Furthermore, steel frame traffic control gates would be installed on the L26NW access road on either side of the GMHOA Road and remain locked except for use by EnCana or BLM personnel. Other components of the Traffic Control Plan include:

- EnCana would undertake full road maintenance responsibility of the GMHOA Road (from the mailboxes at CR319 to the top of hill (NW¼ NE¼ of Section 34, T6S, R93W) during the period of well drilling and completion work on the seven wells on L26NW pad.
- EnCana traffic on L26NW road would yield to all HOA traffic, with one EnCana vehicle allowed to cross at any given time.
- All water used to support drilling and completion operations would be pumped water in buried water lines from the C26NW pad on the valley floor.

During project planning for the L26NW road, an existing 2-track route was reviewed as a possible road alignment segment across the slope east of the H27NW pad; however, the grade of the 2-track was found to be too steep. The initial 1700 feet of the proposed L26NW road would traverse below, across, or just above the 2-track route. An additional project component of the Proposed Action would be the conducting of the final reclamation work for the 2-track. Reclamation work would include:

- Stockpiling appropriately sized trees during the L26NW clearing along the upper and lower ends of the 2-track where it is bisected by the L26NW road.
- Ripping the unvegetated portions of the 2-track with a small excavator.
- Placing the stockpiled trees along the 2-track route for a vehicle and sediment barrier.
- Seeding the ripped 2-track route to establish desirable native vegetation.

The proposed gas gathering and water lines for the new pad would be buried in a separate 35- to 50-foot variable width corridor that traverses cross-country from L26NW pad about 0.9 mile (4700 feet) northeast down to the existing EnCana C26NW well pad near the valley floor (Figure 3). EnCana requested a 55-foot right-of-way for the pipeline construction; after a series of field reviews, it was determined that the corridor width would be constricted to a minimum of 35 feet along flatter stretches, with an expansion to a 50-foot corridor along and at the base of the steeper segments.

The C26NW pad is served by an existing 0.5-mile spur road off CR319. The storage tanks that collect the fluids (produced water and condensate) generated from the wells on the L26NW pad would be located at the C26NW pad, thereby reducing truck traffic to the L26NW pad during the expected 30-year productive life of the wells. A maximum 6-inch-diameter flexsteel gas pipeline and two maximum 4-inch diameter flexsteel production (water) lines would be buried in the pipeline corridor. The facilities to be located on the L26NW pad would be the seven wellheads, seven separator units housed in two production packs, and the associated buried lines. Total short-term disturbance associated with installation of the buried pipelines would amount to 4.8 acres (average width of 45 feet x 4,700 feet). Limits of disturbance would be staked on the ground prior to beginning of associated construction work. The trees cleared during the pipeline installation would be windrowed along the edge of the disturbance for later placement back across the reshaped and seeded corridor to provide an impediment to motorized vehicle use. Although about 300 to 400 feet of the proposed pipeline would directly parallel the GMHOA Road to protect important resource values nearby, the construction of the pipeline would be accomplished without any vehicles or equipment being used along the GMHOA Road.

Total short-term surface disturbance associated with the Proposed Action—including road (6.5 acres), pipelines (4.8 acres), and well pad (4.8 acres)—would be 16.1 acres of direct impact occurring on BLM land. The long-term disturbance area for pad and road would amount to 3.4 acres.

The pad, road, and pipelines would be constructed to standards described in *Surface Operating Standards for Oil and Gas Exploration & Development* (BLM 2006b). The standard Conditions of Approval identified in the GMGAP would also apply to the Proposed Action. Appendix D lists the specific Surface Use Conditions of Approval that would be implemented as mitigation measures for this project.

The Proposed Action would include well drilling and completion operations, installation of production facilities (wellheads and separators on the L26NW pad and storage tanks on the C26NW pad), production of natural gas, and interim and final reclamation measures. The Application for Permit to Drill (APD) for each new well includes a drilling program and a multi-point surface use and operations plan that describe details of well pad construction and interim reclamation. The Proposed Action would be implemented consistent with the terms of the Federal Lease, and with conditions of approval attached to each APD (see Appendices D and E).

### **Alternative Road and Pipeline Alignment**

After meeting with the GMHOA Board on August 18, 2009, Steve Bennett, BLM Field Manager, requested that a viable Alternate Road route to the L26NW pad be developed that did not cross the GMHOA Road. Jim Byers, BLM Natural Resource Specialist, combined components of the C26NW Route (see “Alternatives Considered but Dropped from Further Consideration”) with the upper alignment of the of the Proposed Action route to develop the Alternative Road and Pipeline scenario. The majority of the Alternative Road and Pipeline has been previously staked and reviewed by EnCana and BLM personnel during the project development. The double switchback feature of the C26NW route was deleted and replaced with gradual switchback that transitions into the upper ¼ of the Proposed Action route (see Figure 4).

A challenging feature of the original C26NW route remains with the development of the Alternative Road and Pipeline with the 600-foot segment of relatively steep sideslopes that parallels the GMHOA Road. The proximity to the existing GMHOA Road would require the 600-foot segment to be constructed without any measurable sidecasting of dirt during the road pioneering (end-haul construction techniques). Nearly the entire Alternative Road and Pipeline would be constructed with a requirement that cleared trees be windrowed along the downslope side to create a windrow barrier to catch rolling debris, rocks, and other materials that could be generated during the road construction operations. If the construction techniques are unable to control rolling hazard, a person with radio communications with the equipment operators would be staged along the GMHOA Road to delay construction work when vehicles are passing along the GMHOA Road.

The project area for the Alternative Road and Pipeline would be accessed from I-70 Exit 90 at Rifle, then along Airport Road in South Rifle to CR319 (Figure 1). Approximately 1.25 miles south on CR319, gasfield vehicles would use EnCana’s C26NW road for 0.25 mile to the beginning of the Alternative Road and Pipeline, which would be 1.19 mile in length, to be constructed entirely on BLM land. This route would not cross but be constructed generally uphill from and parallel to the GMHOA Road, and then climbing back up the north-facing slopes of the eastern edge of Grass Mesa to the proposed L26NW pad location.

Like the alignment proposed by EnCana, the Alternative Road and Pipeline would be located in Utah juniper with scattered pinyon pines. The route would cross a number of unnamed ephemeral drainages that would require culverts, riprap with native rock, and stormwater controls.

## EnCana's Proposed L26NW Pad

T6S R93W Sec 26, NW $\frac{1}{4}$ SW $\frac{1}{4}$ , 6th PM  
Garfield County, CO

Surface Owner: BLM

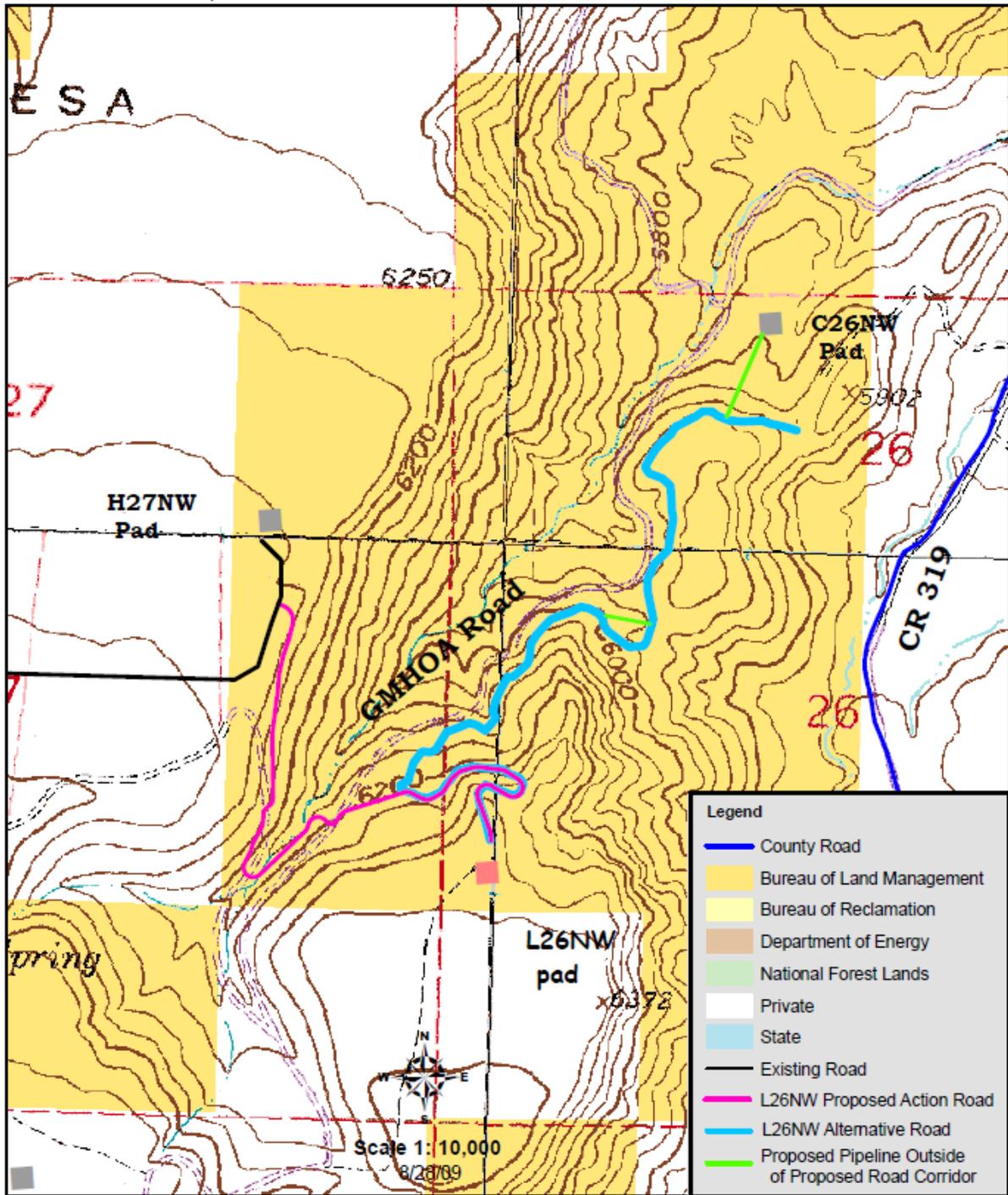


Figure 4. L26NW Alternative Road and Pipeline alignment.

The Alternative Road and Pipeline would be 1.19 miles (approximately 6,300 feet) in length, with a travelway width of 16 feet. The road would originate along the C26NW Road, generally parallel the GMHOA Road while continually gaining elevation up the northern slope of Grass Mesa, and terminate at the proposed L26NW pad described under the Proposed Action. The road would be constructed from the centerline stakes established in the field. The upper 1,000 feet would be constructed using the stamped, engineered pad design package prepared and submitted by River City Consultants, Grand Junction, Colorado. The design package details a series of culvert locations to maintain proper road drainage and inter-visible turnouts to allow for safe passage of vehicles.

Construction, maintenance, and reclamation of the road would adhere to the Best Management Practices outlined in BLM's Gold Book, *Surface Operating Standards for Oil and Gas Exploration & Development* (BLM2006b). Limits of disturbance would be staked on the ground prior to beginning the road construction work. During pioneering of the roadway, trees that are cleared and grubbed would be broken down with excavation equipment and placed along the toe of the fillslope in a windrow to act as a sediment filter and catch barrier for rolling debris; straw wattles would be placed along the outside edge of the disturbance areas to catch any residual sediment. The cutslopes on the road would be step-terraced with some terrace widths designed to allow the placement of cleared trees for visual mitigation. The less steep cutslopes would be laid back to 2:1 slope to allow for more favorable slope for reclamation establishment. Ditch flows into culverts would be controlled with aggregate check dams, sediment traps, and erosion control wattles; culvert outlets would be protected with riprap or erosion control mats. Disturbed areas, including road slopes, would be covered with seed tacked straw and erosion control mulch or blankets. Appendix B provides a Culvert List for the Alternative Route.

The average disturbance width for the proposed road would be 60 feet. Total short-term disturbance associated with road construction would amount to 8.7 acres. The long-term disturbance (essentially the road travelway) would be 3.2 acres.

The proposed pipeline along this alignment would generally be located within the planned disturbance corridor of the roadway, with the exception of two areas shown in green in Figure 4. The upper pipeline route deviation would avoid road construction conflicts across the ravines the proposed road would cross and the lower deviation would incorporate an acceptable segment of the original Proposed Action pipeline route given the gravity feed nature of the water lines onto the C26NW pad. The additional short-term disturbance attributed to the pipeline deviations amounts to 1.5 acres based on a total length of 1,320 feet of the separate pipeline corridor with a disturbance width of 50 feet. Long-term disturbance would be negligible since the pipeline disturbed areas would be reclaimed and seeded per COAs (see Appendix D).

In summary, short-term disturbance associated with the Alternative Road and Pipeline and the L26NW pad would amount to 15.0 acres. Long-term disturbance would be 4.4 acres.

The standard Conditions of Approval identified in the GMGAP would also apply to the Proposed Action. Appendix D lists the specific Surface Use Conditions of Approval that would be implemented as mitigation measures for this project.

### **NO ACTION ALTERNATIVE**

The Proposed Action involves Federal subsurface minerals encumbered with Federal oil and gas leases that grant the lessee a right to explore and develop the leases. Although BLM cannot deny the right to drill and develop the leasehold, individual APDs can be denied to prevent unnecessary and undue degradation. The No Action alternative constitutes denial of the APDs associated with the Proposed Action.

Under the No Action alternative, none of the proposed developments described in the Proposed Action would take place, since the Fee wells could not be drilled without crossing BLM land.

### **PURPOSE AND NEED FOR THE ACTION**

The purpose of the action is to develop oil and gas resources on Federal lease COC54737 consistent with existing Federal Lease rights. The action is needed to increase the development of oil and gas resources for commercial marketing to the public.

### **ALTERNATIVES CONSIDERED BUT DROPPED FROM FURTHER CONSIDERATION**

#### **J26NW Road Alignment**

EnCana's original road alignment proposal presented to BLM in summer 2008 involved a new route that would originate on private land off CR319 just south of the existing J26NW pad, cross over Mamm Creek onto BLM land, and traverse south for 0.3 mile into a switchback. The route would then traverse north back across the midslopes on the eastern side of Grass Mesa for another mile, including an additional two extremely tight switchbacks on steep (50%) slopes located just above the GMHOA Road (Figure 5). The route, approximately 1.8 miles in length, was dropped from further consideration due to the following:

- failure to mitigate direct impacts to known cultural resource values
- failure to satisfy Class III VRM objectives since a sizable portion of the road would have been in direct view along CR319
- failure to overcome expensive engineering and exorbitant road construction costs to develop a series of road switchbacks on steep sideslopes and fragile, erosive soils, the potential to create rock hazards on the GMHOA Road since a sizable portion of the new road would parallel or be constructed uphill of and alongside portions of the GMHOA Road

#### **C26NW Road Alignment**

This alignment was one of the routes EnCana presented to GMHOA residents during a special meeting held in October 2008 (shown as the blue route on Figure 6 and referenced in Appendix A). With the exception of a challenging double switchback, this route closely resembles the Alternative Road and Pipeline analyzed in this document. The C26NW route had an improved road alignment since it did not have to cross Mamm Creek, used portions of the existing C26NW pad road, was not directly in the viewshed along CR319, and avoided many direct impacts to cultural resource values. However, items 3 and 4 listed above under the drawbacks attributed to the J26NW alignment were still unresolved since the C26NW alignment essentially shares the same upper portion of the J26NW route. There still remained the issues with high road construction costs, challenging engineering to develop a safe double switchback on steep, erosive soils, and the potential of rolling hazards onto the GMHOA Road during construction or seasonal wet weather periods.

#### **Upper GMHOA Road Use**

The use of the existing GMHOA Road from the top of Grass Mesa to the proposed L26NW intersection point with the GMHOA Road including the new construction segment of the proposed L26NW road east of the GMHOA Road as presented in the Proposed Action was initially considered by the BLM. After conducting a thorough field review and consulting with EnCana, it was determined that the 0.8 mile of existing GMHOA Road had steep road grades (>15%) with little or no opportunity to realign without additional disturbance and continued negotiations with potentially unwilling GMHOA lot owners.

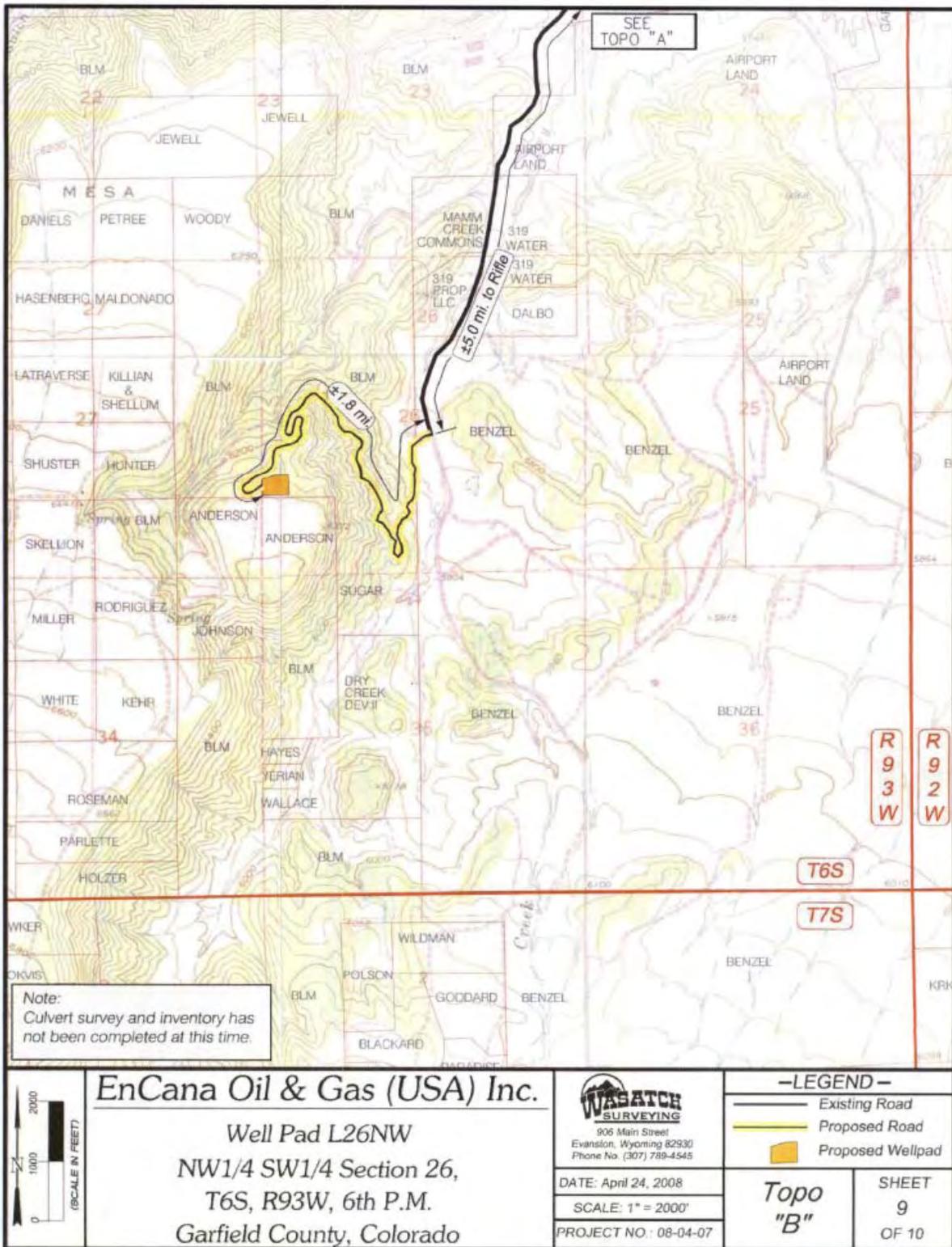


Figure 5. J26NW Road route – EnCana’s initial access proposal to the proposed L26NW Pad. This potential alignment was not analyzed in detail (see text).

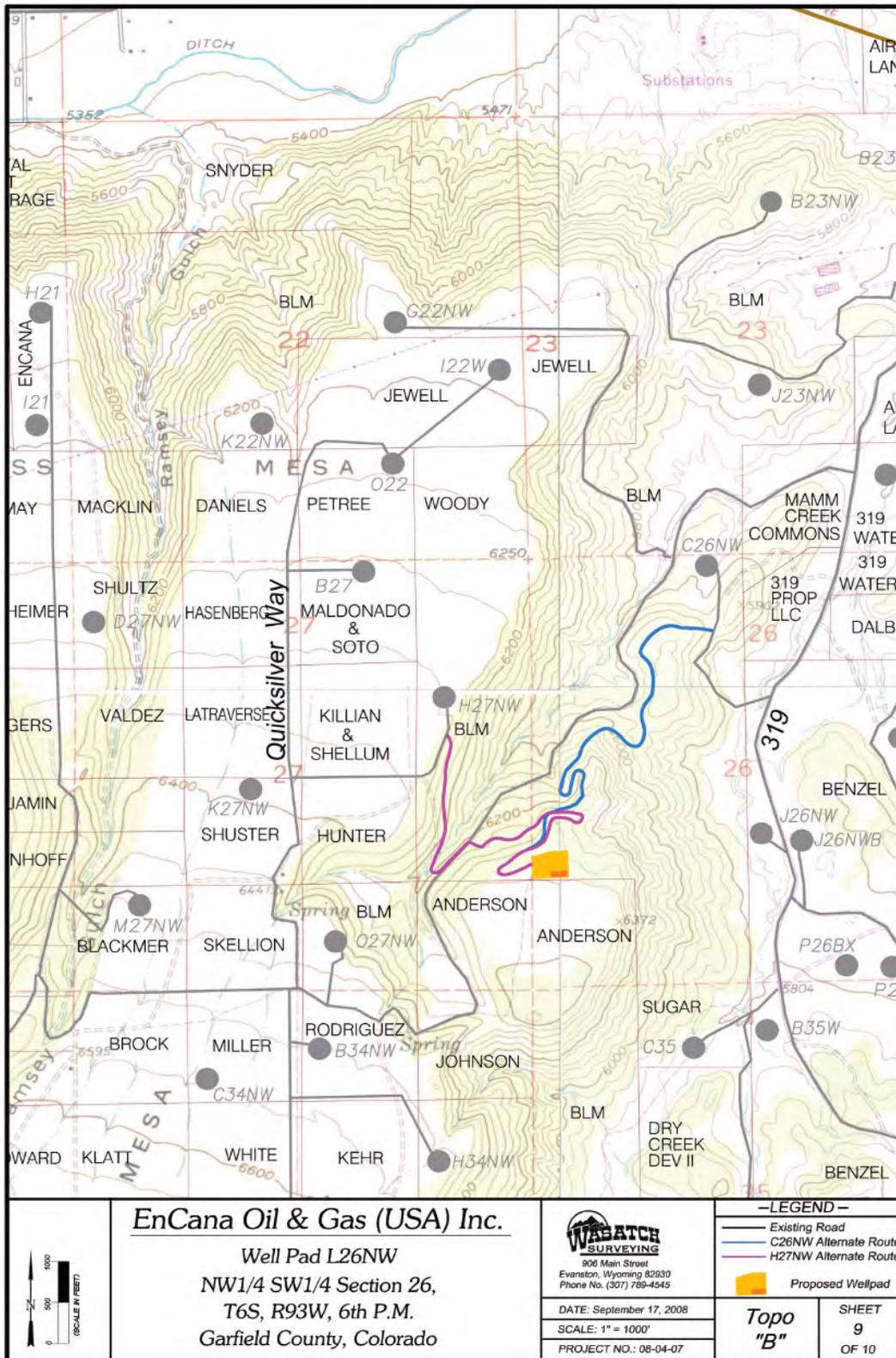


Figure 6. C26NW Route, shown in blue. Magenta route represents an early version of the Proposed Action. Neither alignment was analyzed in detail (see text).

### Use of GMHOA Road for Pipeline Route to the C26NW Pad

This option would involve installation of the buried pipelines along a portion of the GMHOA Road from the L26NW intersection point downhill along the road ditch of the GMHOA Road to the C26NW pad. The issue of creating a construction obstacle along approximately 1 mile of GMHOA Road for any number of weeks to install the buried gas and water lines was deemed unacceptable for the following reasons: (1) shared traffic use issues for GMHOA residents that could create similar problems with traffic and safety that arose when COGCC issued its NOAV in 2002; (2) the steep road cuts along the majority of the GMHOA road that would need to be disturbed and laid back, involving reclamation challenges and lengthening of the construction time to install the pipelines; (3) the narrow roadway combined with corresponding constricted pipeline construction work area due to steep road cuts, creating an unsafe work environment for pipeline crews; and (4) the narrow road roadway combined with corresponding constricted pipeline construction work area resulting in likely closure of the GMHOA Road for a period of time to safely install the pipeline because GMHOA traffic would be unlikely to negotiate around the pipeline construction were it allowed along the GMHOA Road.

### SUMMARY OF LEASE STIPULATIONS

Table lists the lease stipulations applicable to this project. These protective stipulations are in addition to standard or site-specific Conditions of Approval (COAs) presented in Appendices D and E.

<b>Table 2. Lease Stipulations Applicable to the Proposed Action</b>		
<i>Lease Number</i>	<i>Description of Lands</i>	<i>Lease Stipulations</i>
COC54737	All Lands within Lease	<p><b>Timing Limitation:</b> Big Game Winter Habitat (December 1 – April 30). Exception may be granted under mild winter conditions for the last 60 days of the closure. <u>Note: In fall 2007, EnCana requested a temporary 2-year modification to the lease terms for the Big Game Winter Habitat Timing Limitation for the Federal leases located on Grass Mesa. This request was approved in fall 2007 by BLM effectively allowing the drilling or completion activities to continue unabated on Grass Mesa Federal leases through November 30, 2010. The L26NW pad was included in the list of pads scheduled for the year-round drilling (noted as I27NW pad in the request letter).</u></p> <p><b>Controlled Surface Use:</b> Protection of fragile soils with submittal of plan of development demonstrating performance objectives and standards. Performance Objectives: Maintain the soil productivity of the site; protect off-site areas by preventing accelerated soil erosion (such as land-sliding, gullyng, rilling, piping, etc.) from occurring; protect water quality and quantity of adjacent surface area and groundwater sources; and select the best possible site for development in order to prevent impact to soil and water resources.</p> <p><b>Lease Notice:</b> An inventory of fossil resources in Class I and II paleontological areas must be performed by an accredited paleontologist approve by BLM.</p>

## **PLAN CONFORMANCE REVIEW**

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

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

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

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

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

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

## **STANDARDS FOR PUBLIC LAND HEALTH**

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

These analyses are conducted in relation to baseline conditions described in land health assessments (LHAs) completed by the BLM. The Proposed Action would be located in an area (Divide Creek) that is currently undergoing field review for the preparation of the LHA report. At this time, the landscape addressed in this EA has not had a formal Land Health Assessment completed. Therefore, no formal determination on conformance with Standards will be made until a formal Land Health Assessment and Determination Document is completed.

## **AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES**

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

A variety of laws, regulations, and policy directives mandate the evaluation of the effects of a Proposed Action and alternative(s) on certain critical environmental elements. Some of the critical elements that require inclusion in this EA are not present; others may be present but would not be affected by the Proposed Action and alternative (Table 3). Only the mandatory critical elements that are present and affected are described in the following narrative.

<b>Table 3. Critical Elements of the Human Environment</b>									
<i>Critical Element</i>	<i>Present</i>		<i>Affected</i>		<i>Critical Element</i>	<i>Present</i>		<i>Affected</i>	
	Yes	No	Yes	No		Yes	No	Yes	No
Air Quality	X		X		Prime or Unique Farmlands		X		X
ACECs		X		X	Special Status Species*	X		X	
Cultural Resources	X			X	Wastes, Hazardous or Solid	X		X	
Environmental Justice	X			X	Water Quality, Surface and Ground*	X		X	
Floodplains		X		X	Wetlands and Riparian Zones*	X		X	
Invasive, Non-native Species	X		X		Wild and Scenic Rivers		X		X
Migratory Birds	X		X		Wilderness and Wilderness Study Areas		X		X
Native American Religious Concerns		X		X					

\* Public Land Health Standard

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

### **Critical Elements**

#### **Air Quality**

##### **Affected Environment**

The project area lies within Garfield County, which has been described as an attainment area under CAAQS and NAAQS (Colorado Ambient Air Quality Standards and National Ambient Air Quality Standards). The CAAQS and NAAQS are health-based criteria for the maximum acceptable concentrations of air pollutants at all locations to which the public has access. An attainment area is an area where ambient air pollution quantities are below (i.e., better than) NAAQS standards.

Although specific air quality monitoring has not been conducted in the Grass Mesa field, regional air quality monitoring has been conducted near the study area. Air pollutants measured in the region for which ambient air quality standards exist include: carbon monoxide (CO), nitrogen dioxide (NO<sub>2</sub>), ozone (O<sub>3</sub>), particulate matter less than 10 microns in effective diameter (PM<sub>10</sub>), particulate matter less than 2.5 microns in effective diameter (PM<sub>2.5</sub>), and sulfur dioxide (SO<sub>2</sub>). Background pollutant concentrations for these pollutants are compared to the CAAQS and NAAQS in Table 4, where it can be seen that regional background values are well below established standards.

Federal air quality regulations adopted and enforced by CDPHE limit incremental emissions increases to specific levels defined by the classification of air quality in an area. The Prevention of Significant Deterioration (PSD) Program is designed to limit the incremental increase of specific air pollutant concentrations above a legally defined baseline level. Incremental increases in PSD Class I areas are strictly limited, while increases allowed in Class II areas are less strict. The project area and surrounding areas are classified as PSD Class II. The PSD Class I areas located within 75 miles of the project area are

Flat Tops Wilderness (25 miles northeast), Maroon Bells – Snowmass Wilderness (35 miles southeast), West Elk Wilderness (50 miles southeast), Black Canyon of the Gunnison National Park (60 miles South), and Eagles Nest Wilderness (70 miles east). Two PM<sub>10</sub> nonattainment areas are present within 75 miles of the project area: around the towns of Aspen (50 miles southeast) and Steamboat Springs (75 miles northeast). These sensitive areas have the potential to be impacted by cumulative project source emissions. Regional background pollutant concentrations, as well as NAAQS, CAAQS, and PSD Class I and II Increments, are also presented in Table 4.

<b>Table 4. Air Pollutant Background Concentrations, Colorado and National Ambient Air Quality Standards, and Prevention of Significant Deterioration (PSD Increments (µg/m<sup>3</sup>)).</b>				
<b>Pollutant/Averaging Time</b>	<b>Measured Background Concentration</b>	<b>Colorado and National Ambient Air Quality Standards</b>	<b>Incremental Increase Above Legal Baseline</b>	
			<b>PSD Class I</b>	<b>PSD Class II</b>
Carbon Monoxide (CO) <sup>1</sup>				
1-hour	1,145	40,000	n/a	n/a
8-hour	1,145	10,000	n/a	n/a
Nitrogen dioxide (NO <sub>2</sub> ) <sup>2</sup>				
Annual	9	100	2.5	25
Ozone <sup>3</sup>				
1-hour	173	235	n/a	n/a
8-hour	145	157		
Particulate Matter (PM <sub>10</sub> ) <sup>1</sup>				
24-Hour	41	150	8	30
Annual	11	50	4	17
Particulate Matter (PM <sub>2.5</sub> ) <sup>4</sup>				
24-Hour	18	65	n/a	n/a
Annual	8	15	n/a	n/a
Sulfur dioxide (SO <sub>2</sub> ) <sup>5</sup>				
3-hour (NAAQS)	24	1,300	25	512
3-hour (CAAQS)	24	700	25	512
24-hour (NAAQS/CAAQS)	13	260	5	91
Annual (NAAQS/CAAQS)	5	80	2	20

<sup>1</sup> Background data collected at American Soda, Piceance 2003-2004 (CDPHE 2006c).  
<sup>2</sup> Background data based on a rural default that is based on Southern Ute stations near Ignacio (CDPHE 2006c).  
<sup>3</sup> 1-hour ozone based on Mesa Verde, 2003 data. 8-hour ozone based on CASTNET in Mesa Verde, Canyonlands, and Gothic (CDPHE 2006c).  
<sup>4</sup> Background data collected at 515 Patterson, Grand Junction, CO (CDPHE 2006c).  
<sup>5</sup> Background data collected at Unocal, 1983-1984 (CDPHE 2006c).

CDPHE, under their EPA approved State Implementation Plan, is the primary air quality regulatory agency responsible for determining potential impacts once detailed industrial development plans have been made, and those development plans are subject to applicable air quality laws, regulations, standards, control measures, and management practices. Therefore, CDPHE has the ultimate responsibility for reviewing and permitting the project prior to its operation.

Environmental Consequences

*Proposed Action*

The Roan Plateau RMPA and EIS describe potential effects from oil and gas development (BLM 2006a: 4-26 to 4-37). Analysis was completed with regard to greenhouse gas emissions, a near-field and far-field analysis for “criteria pollutants” (particulate matter [PM<sub>10</sub> and PM<sub>2.5</sub>], carbon monoxide, sulfur dioxide, and nitrogen oxides), and hazardous air pollutants (benzene, ethylbenzene, formaldehyde, hydrogen sulfide, toluene, and xylenes). Sulfur and nitrogen deposition, acid neutralizing capacity, and a visibility screening analysis were also completed in the Roan Plateau RMPA and EIS. Because the visibility screening analysis showed potential impacts at one or more Class I areas, a refined visibility analysis was also completed. The refined visibility analysis indicated a “just noticeable” impact on visibility for one day each at two Class I areas (Black Canyon of the Gunnison National Park and Mt. Zirkel Wilderness). For the other pollutants analyzed, the implementation of oil and gas development under the Roan Plateau RMPA and EIS would have either no or negligible long-term adverse impacts on air quality. Since the Proposed Action is within the scope of the reasonable foreseeable development scenario analyzed in that document, it is anticipated that the Proposed Action would be unlikely to have adverse effects on air quality.

Activities described in the proposed action would result in localized short-term increases in emissions from vehicles and drilling equipment and fugitive dust from construction and use of the well pad and access road. Concentrations would be below applicable ambient air quality standards as analyzed in the Roan Plateau RMPA and EIS. Construction activities would take place during the hours of 7:00 a.m. and 6:00 p.m. each day for a period of five or six weeks. Once construction activities have been completed, air quality impacts associated with these activities would also cease. Drilling and completion of wells (using an 1,100-hp drilling rig) is anticipated to take approximately one year, assuming that each well will take 22 days to drill, 30 days to complete, and a 40% drill rig utilization. Table 5 lists the annual emission rates from the proposed drilling and construction activities.

<b>Table 5. Potential Emissions from Drilling and Construction Activities</b>					
Source	Pollutant	Emission Factors (g/hp-hr)	Yearly Hours of Operation (hrs)	Annual Emissions (tons/year)	Reference
Drilling (using 1100 hp drill rig)	NO <sub>x</sub>	6.9	4,370	29.3	Tier I
	CO	8.5	4,370	36.1	Tier I
	VOC	1.0	4,370	4.25	Tier I
	PM <sub>10</sub>	0.4	4,370	1.3	Tier I
	PM <sub>2.5</sub>		4,370	0.20	EPA Multiplier
	Formaldehyde	0.0018	4,370	0.06	AP42 Table 3.3-2
Construction Heavy Equipment	PM <sub>10</sub>	1.2 (tons/acre/month)	20 acres 6 weeks*	16.95	AP42 13.2.3.3
	PM <sub>2.5</sub>			2.55	EPA Multiplier
*Activity durations are about 6 weeks. (Well pad construction, 2 weeks; access road construction 6 weeks; and pipeline construction 2 weeks, all performed simultaneously.)					

The anticipated air impacts associated with well pad construction and drilling are limited in duration and are anticipated to be minor sources. The emissions from drilling are not anticipated to adversely affect any of the Class I areas. These activities are also not anticipated to exceed any ambient air quality standards.

Once the wells are completed ancillary equipment will be installed associated with production and operation, including condensate tanks, water pumps, and heaters associated with separators. The pumps are anticipated to be small 10- to 25-hp units and would be used to move water from the sites. Similarly, the separator heaters would be small 500-BTU/hr units. Projected emissions from the pumps and heaters are anticipated to be negligible. Emissions from the condensate tanks (to be constructed on the C26NW pad) are listed in Table 6. The calculated estimates assume that 15 barrels per day (bbl/day) of water would be produced from each well and approximately 10% of the produced water would be condensate.

<b>Table 6. Condensate Tank Emission Estimates for Completed Well Pad</b>					
<b>Source</b>	<b>Pollutant</b>	<b>Emission Factors (lb/bbl)</b>	<b>Production (bbl/day)</b>	<b>Annual Emissions (tons/year)</b>	<b>Reference</b>
Four to six 400-bbl Condensate Tanks (7 wells)	VOC	10	10-18	9-18	CDPHE Guidance for Garfield County

The air impacts associated with the condensate tanks are anticipated to be minor. However, volatile organic compound (VOC) emissions are dependent on the characteristics of the condensate, tank operations, and production. If VOC emissions need to be reduced, a vapor recovery or thermal destruction system can be installed that can effectively reduce VOC emissions by 95%.

In contrast to the above, it is anticipated that construction, drilling, and production activities would produce high levels of fugitive dust in dry conditions if dust abatement measures are not applied. To mitigate dust generated by these activities, the operator would be required to implement dust abatement strategies as needed by watering the access road and construction areas and/or by applying a surfactant approved by BLM (see Appendix D).

*Alternative Road and Pipeline*

Air quality impacts generated by this alternative would be approximately equal to those of the Proposed Action, due to the comparable short-term (15.0 acres vs. 16.1 acres) and long-term (4.4 acres vs. 3.4 acres) areas of disturbance created by the two actions.

*No Action Alternative*

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

## Cultural Resources

### Affected Environment

The Class III cultural resources inventory (GSFO# 5404-16) encompasses the proposed and alternative actions. No cultural resources eligible or potentially eligible for listing on the National Register of Historic Places were identified along the proposed or alternative routes. Extant significant cultural resources are being exposed nearby.

### Environmental Consequences

#### *Proposed Action*

There should not be any direct affects to cultural under the proposed action. As such no formal consultation with the Colorado State Historic Preservation Officer (SHPO) was undertaken and a determination of “**No Historic Properties Affected** “ was made in accordance with the National Historic Preservation Act (NRHP), as amended (16 USC 470f), National BLM/SHPO Programmatic Agreement (1997), and the Colorado Protocol (1998).

Indirect and cumulative impacts to cultural resources during the construction of the pipeline could result in a range of impacts to known and undiscovered cultural resources. These impacts would be mitigated somewhat by the Education/Discovery COA. Once the pipeline is seated and the ground surface rehabbed the potential for this type of impact would be almost nil. These impacts could include illegal collection of artifacts, excavation, or vandalism. To mitigate the potential of buried cultural deposits being exposed and destroyed during construction an archaeological monitor would be required along the pipeline in the north half of Section 26, and the Education/Discovery COA should be attached to the permit (see Appendix D).

#### *Alternative Road and Pipeline*

No direct adverse effects to cultural resources are expected to result from implementation of this alternative. Therefore, no formal consultation with the Colorado State Historic Preservation Officer (SHPO) was undertaken, and a determination of “**No Historic Properties Affected** “ was made in accordance with the NRHP, the National BLM/SHPO Programmatic Agreement (1997), and the Colorado Protocol (1998).

Indirect and cumulative impacts from construction of the road and pipeline could result in a range of impacts to nearby known and undiscovered cultural resources. The potential for these impacts would continue from the development phase through abandonment of the well, road and pipeline. These impacts could include illegal collection of artifacts, excavation, or vandalism.

To mitigate the potential of buried cultural deposits being exposed and destroyed during construction an archaeological monitor would be required along the proposed road and pipeline in the north half of Section 26. Additionally, the Education/Discovery COA should be attached to the permit (Appendix D).

#### *No Action Alternative*

This alternative would result in no impacts to known or undiscovered cultural resources because none of the project components would be constructed and operated.

## **Invasive Non-native Species**

### Affected Environment

The project is located within a juniper woodland community with a minor component of pinyon pine. Various native grasses and forbs are present. Cheatgrass (*Anisantha tectorum*), classified by the State of Colorado as a List C noxious weed, is found throughout the project area.

### Environmental Consequences

#### *Proposed Action*

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

#### *Alternative Road and Pipeline*

Since the surface disturbance is fairly similar under the Alternative Road and Pipeline (16.1 acres under Proposed Action compared with 15.0 acres under Alternative Route), weeds would similar impacts as identified under Proposed Action.

#### *No Action Alternative*

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

## **Migratory Birds**

### Affected Environment

For the purpose of this EA, the term “migratory birds” applies generally to native bird species protected by the Migratory Bird Treaty Act (MBTA). This includes native passerines (flycatchers and songbirds) as well as birds of prey, migratory waterbirds (waterfowl, wading birds, and shorebirds), and other species such as doves, hummingbirds, swifts, and woodpeckers. The term “migratory” is a misnomer and should be interpreted broadly to include native species that remain in the same area throughout the year as well as species that exhibit patterns of latitudinal or elevational migration to avoid winter conditions of cold or a shortage of food. For most migrant and native resident species, nesting habitat is of special importance because it is critical for supporting reproduction in terms of both nesting sites and food. Also, because birds are generally territorial during the nesting season, their ability to access and utilize sufficient food is limited by the quality of the territory occupied. During non-breeding seasons, birds are generally non-territorial and able to feed across a larger area and wider range of habitats.

Among the wide variety of species protected by the MBTA, special concern is usually given to the following groups:

- Species that migrate across long distances, particularly Neotropical migrant passerines that winter in tropical or Southern Hemisphere temperate zones.

- Birds of prey, which require large areas of suitable habitat for finding sufficient prey.
- Species that have narrow habitat tolerances and hence are vulnerable to extirpation from an area as a result of a relatively minor habitat loss.
- Species that nest colonially and hence are vulnerable to extirpation from an area and hence are vulnerable to extirpation from an area as a result of very minor habitat loss.

Because of the many species that fall within one or more of these groups, BLM focuses on species identified by the U.S. Fish and Wildlife Service (USFWS) as Birds of Conservation Concern (BCC). The current BCC list (USFWS 2008a) for Region 16 (Southern Rockies/Colorado Plateau) includes nine species potentially present in or near the project area: the bald eagle (*Haliaeetus leucocephalus*), flammulated owl (*Otus flammeolus*), yellow-billed cuckoo (*Coccyzus americanus*), Lewis's woodpecker (*Melanerpes lewis*), willow flycatcher (*Empidonax traillii*), gray vireo (*Vireo vicinior*), pinyon jay (*Gymnorhinus cyanocephalus*), juniper titmouse (*Baeolophus griseus*), and Brewer's sparrow (*Spizella breweri*). Of these, the bald eagle and yellow-billed cuckoo are addressed in the section of this EA titled "**Special Status Species.**"

The remaining species include three pinyon-juniper obligates (pinyon jay, gray vireo, and juniper titmouse), a species of coniferous forests (flammulated owl), a sagebrush obligate (Brewer's sparrow), and a near-obligate in willow carr shrublands (willow flycatcher). Because pinyon-juniper habitats dominate the project area, the pinyon jay, juniper titmouse, and gray vireo are potentially present within or near potentially affected areas. The flammulated owl is also potentially present, although this species is more likely to occur in higher elevation montane coniferous forests. Sufficient habitat is not present in the project area to support the Brewer's sparrow or willow flycatcher.

Other migratory birds commonly associated with pinyon-juniper habitats but not on the BCC list include Neotropical migrants such as the dusky flycatcher (*Empidonax oberholseri*), plumbeous vireo (*Vireo plumbeus*), black-throated gray warbler (*Dendroica nigrescens*), blue-gray gnatcatcher (*Poliptila caerulea*), and lesser goldfinch (*Carduelis psaltria*), as well as a resident species, the house finch (*Carpodacus mexicanus*). Small areas of deciduous trees and tall shrubs along the drainage to be crossed by the proposed road and pipeline may also support additional Neotropical migrants such as the cordilleran flycatcher (*Empidonax difficilis*), western wood-pewee (*Contopus sordidulus*), warbling vireo (*Vireo gilvus*), and lazuli bunting (*Passerina amoena*).

## Environmental Consequences

### *Proposed Action*

The Proposed Action would result in direct habitat loss of 16.1 acres of habitat, mostly in pinyon-juniper. This habitat loss could reduce slightly the number of nesting pairs of the BCC or other bird species associated with this habitat type. Impacts to other habitat types would be smaller, and probably below the threshold that would affect populations of migratory birds.

In general, small birds are less vulnerable to indirect habitat loss from human activity and operation of noisy equipment than are some other wildlife species. However, a zone of reduced use or avoidance by BCC and Neotropical migrant species is likely to occur along the newly created habitat edges and extending back a distance of several tens of feet. This zone would extend farther from the habitat edges during construction, drilling, and completion operations. During periods of less intensive human activity as the project moves into the production phase, the zone of reduced use would become smaller. In general, zones of indirect habitat loss are narrower in wooded habitats than in habitats that are more open.

To minimize impacts to migratory birds, a 60-day TL would be applied as a COA (see Appendix D) to prohibit the removal of vegetation from May 15 through July 15. An exception to this TL may be granted by BLM or the WRNF if surveys during the breeding season by a qualified observer demonstrate that no nest of BCC or other Neotropical species would be destroyed (see Appendix D). Another TL in Appendix D specific to raptor nests addresses the fact that raptors and active nests are protected under the MBTA and that future restrictions on construction, drilling, or completion activities could be applied if a nest is constructed and used by raptors in proximity to the project. No nests were found during project-specific surveys in 2005.

BLM also requires measures to protect migratory birds from injury or mortality resulting from exposure to harmful fluids stored or disposed in pits on the well pads. An additional COA in Appendix D addresses this issue.

#### *Alternative Road and Pipeline*

Impacts to migratory birds under this alternative would be comparable to those under the Proposed Action. Total habitat loss under this alternative would be somewhat greater (15.0 versus 11.3 owing to a longer road and partially separate pipeline route). On the other hand, this route would avoid crossing the unnamed drainage. The same 60-day TL for vegetation removal, the raptor nest TL, and the COA for to protect migratory birds from exposure to potentially harmful fluids (see Appendix D) would apply to this alternative as well as to the Proposed Action.

#### *No Action Alternative*

Impacts to migratory birds would not occur under the No Action alternative because none of the project components would be built.

### **Native American Religious Concerns**

#### Affected Environment

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

#### Environmental Consequences

##### *Proposed Action*

Although there would be no direct impacts from the proposed action, indirect impacts from increased access and personnel during the proposed action could result in impacts to unknown Native American resources ranging from illegal collection to vandalism. The standard Education/Discovery/NAGPRA COA for Native American resource protection should be attached to the permit (see Appendix D). The importance of this COA should be stressed to personnel involved informing them of their responsibilities to protect and report any cultural resources encountered.

##### *Alternative Road and Pipeline*

Potential impacts with respect to Native American religious concerns would be the same as under the Proposed Action.

#### *No Action Alternative*

This alternative would result in no impact to known or undiscovered Native American resources and the potential for indirect affects would be nil.

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

#### Affected Environment

*Threatened or Endangered Plant Species.* According to the latest species list from the U. S. Fish and Wildlife Service (USFWS) (<http://mountain-prairie.fws.gov/endspp/CountyLists/COLORADO.pdf>), the following Federally listed, proposed, or candidate plant species may occur within or be impacted by actions occurring in Garfield County: Uinta Basin hookless cactus (*Sclerocactus glaucus*), Parachute beardtongue (*Penstemon debilis*), Ute ladies'- tresses orchid (*Spiranthes diluvialis*), and DeBeque phacelia (*Phacelia submutica*).

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

*Threatened or Endangered Animal Species.* According to the current species list available online from the U SFWS (<http://mountain-prairie.fws.gov/endspp/CountyLists/COLORADO.pdf>), the following Federally listed, proposed, or candidate threatened or endangered animal species may occur within or be impacted by actions occurring in Garfield County: Canada lynx (*Lynx canadensis*), Mexican spotted owl (*Strix occidentalis*), western yellow-billed cuckoo (*Coccyzus americanus occidentalis*), razorback sucker (*Xyrauchen texanus*), Colorado pikeminnow (*Ptychocheilus lucius*), humpback chub (*Gila cypha*), and bonytail (*Gila elegans*). Suitable habitat for the Canada lynx, Mexican spotted owl, and yellow-billed cuckoo does not occur in or near the project area.

The four fishes—razorback sucker, Colorado pikeminnow, humpback chub, and bony tail—are Federally listed endangered species that occur within the Colorado River drainage basin near or downstream from the project area. Designated Critical Habitat for the razorback sucker and Colorado pikeminnow includes the Colorado River and its 100-year floodplain west (downstream) from the town of Rifle. This portion of the Colorado River lies approximately 3.5 miles north of the CCMDP area.

The nearest known habitat for the humpback chub and bonytail is within the Colorado River approximately 70 miles downstream from the project area. Occasionally, the bonytail is in Colorado west of Grand Junction, but its range does not extend east from that point. Only one population of humpback chubs, at Black Rocks west of Grand Junction, is known to exist in Colorado.

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

The results of a May 2008 inventory indicate the project area contains no BLM sensitive plant species or suitable habitat for these species.

BLM Sensitive Animal Species. Colorado BLM sensitive animal species with geographic and elevational ranges and habitat requirements potentially including the project area are the bald eagle (*Haliaeetus leucocephalus*) and northern goshawk (*Accipiter gentilis*), both of which are only marginally likely to occur, and only irregularly. The bald eagle nests and roosts in mature cottonwood woodlands along the Colorado River a few miles north of the site but could venture upstream along tributary drainages such as Mamm Creek and adjacent uplands—potentially including open habitats on Grass Mesa—in search of prey during winter. The northern goshawk is associated primarily with montane and subalpine conifer forests at elevations higher than those on Grass Mesa. However, goshawks may move downslope into pinyon-juniper habitats during winter. Use of the project vicinity by either of these species would be transitory and limited to winter months.

Three BLM sensitive fish species—the flannelmouth sucker (*Catostomus discobolus*), bluehead sucker (*C. latipinnis*), and roundtail chub (*Gila robusta*)—inhabit the Colorado River and major tributaries of extreme western Colorado. Of these, the bluehead sucker is the species most likely to occur in small such as Mamm Creek but it is not known to occur in the project vicinity. Both the flannelmouth sucker and roundtail chub are known to occur in the Colorado River a few miles from the site.

### Environmental Consequences

#### *Proposed Action*

Threatened or Endangered Plant Species. The project area contains no Federally listed, proposed, or candidate plant species or suitable habitat for these species. Therefore, the Proposed Action would have “**No Effect**” on these species.

Threatened or Endangered Animal Species. Construction activities would increase the potential for soil erosion and sedimentation. Although a minor, temporary increase in sediment transport to the Colorado River may occur, it is unlikely that the increase would be detectable above current background levels. In any case, the Federally listed, proposed, or candidate fish species associated the Colorado River—the razorback sucker, Colorado pikeminnow, humpback chub, and bonytail—are adapted to the naturally high sediment loads that have historically characterized the Colorado River basin and therefore would not be affected by possible minor increases.

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

As part of a Programmatic Biological Opinion (PBO) issued in 1994, the USFWS determined that any depletion of flows in the Colorado River Basin represent a “**May Affect, Likely to Adversely Affect**” determination for the razorback sucker, Colorado pikeminnow, humpback chub, and bonytail as a result of individual projects resulting in a depletion. Under the 1994 PBO and an amendment in the year 2000, BLM was allowed to authorize projects with water depletions of less than 125 acre-feet per year until a total depletion threshold of 3,000 acre-feet per year was reached. In May 2008, BLM prepared a Programmatic Biological Assessment (PBA) addressing water depleting activities associated with oil and gas activities in the Colorado River Basin in Colorado. On December 19, 2008, the USFWS issued a PBO (USFWS 2008b), which determined that BLM water depletions from the Colorado River Basin are not likely to jeopardize the continued existence of the four endangered fishes or to destroy or adversely modify designated critical habitat.

The L26NW project will be entered into the GSFO Fluid Minerals Water Depletion Log, which is submitted to the Colorado State Office, and thence to the USFWS, at the end of the Fiscal Year.

*BLM Sensitive Plant Species.* The project area contains no BLM sensitive plants or suitable habitat. Therefore, there would be no impacts to these species.

*BLM Sensitive Animal Species.* The discussion of potential impacts described above for the endangered Colorado River fishes is also relevant to the three nongame fishes listed as sensitive by the BLM. Because mitigation measures would be implemented (see Appendix D), it is unlikely that the Proposed Action would cause unnatural sediment loads in nearby streams. Depletions in flow volumes would also not be of a magnitude that would affect the BLM sensitive fish species. Similarly, direct or indirect loss of pinyon-juniper habitat would be insufficient to affect the potential irregular and transitory use by bald eagles or northern goshawks. Therefore, no discernible impacts to BLM sensitive species are expected to result from implementation of the Proposed Action.

#### *Alternative Road and Pipeline*

*Threatened or Endangered Plant Species.* The project area contains no Federally listed, proposed, or candidate plant species or suitable habitat for these species. Therefore, the Alternative Road and Pipeline would have “**No Effect**” on these species.

*Threatened or Endangered Animal Species.* Impacts to Federally listed, proposed, or candidate threatened or endangered species under the Alternative Road and Pipeline scenario would be comparable to those under the Proposed Action. In general, however, risks to the four endangered Colorado River fishes would be somewhat less because this road alignment would not cross the unnamed tributary stream. This would reduce even further the minimal potential for transport of sediments or pollutants to the Colorado River. However, this alternative would have essentially identical potential impacts in terms of depletions of flows in the Colorado River and thus would also warrant a determination of “**May Affect, Likely to Adversely Affect**” the razorback sucker, Colorado pikeminnow, humpback chum, and bonytail. As described above for the Proposed Action, the USFWS issued a PBO in 2008 (USFWS 2008b) in which it was determined that BLM water depletions from the Colorado River Basin are not likely to jeopardize the continued existence of the four endangered fishes or to destroy or adversely modify designated critical habitat.

*BLM Sensitive Plant Species.* The project area contains no BLM sensitive plants or suitable habitat. Therefore, there would be no impacts to these species under the Alternative.

*BLM Sensitive Animal Species.* Impacts would be the same as described above for the Proposed Action—i.e., no discernible impacts to the bald eagle, northern goshawk, bluehead sucker, flannelmouth sucker, or roundtail chub.

#### *No Action Alternative*

*Threatened or Endangered Plant Species.* The No Action alternative would not cause impacts to any Federally listed, proposed, or candidate plants because these species do not occur in the area to be affected.

*Threatened or Endangered Animal Species.* The No Action alternative would not cause impacts to any Federally listed, proposed, or candidate animal species because of an absence of ground-disturbing activities.

*BLM Sensitive Plant Species.* The No Action alternative would not cause impacts to any BLM sensitive plants because these species do not occur in the area to be affected.

*BLM Sensitive Animal Species.* The No Action alternative would not cause impacts to any BLM sensitive animal species because of an absence of ground-disturbing activities.

#### Analysis of Public Land Health Standard 4 for Special Status Species

A formal Land Health Assessment has not been completed for the project area watershed. Implementation of either the Proposed Action or the Alternative Road and Pipeline in conjunction with similar activity occurring in the greater watershed would probably trend the area downward somewhat as habitat is lost and fragmented and human use is increased in the area. As no offsite or indirect impacts are anticipated if the COAs are implemented, the Proposed Action and Alternative should have no effect on special status species. Neither the Proposed Action nor the Alternative Road and Pipeline would be expected to result in a failure of the area to achieve Standard 4 for special status species.

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

#### **Wastes, Hazardous or Solid**

##### Affected Environment

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

- The Oil Pollution Act (Public Law 101-380, August 18, 1990) prohibits discharge of pollutants into waters of the US, which by definition would include any tributary, including any dry wash that eventually connects with the Colorado River.
- The Comprehensive Environmental Response, Compensation, and Liability Act (Public Law 96-510 of 1980) provides for liability, compensation, cleanup, and emergency response for hazardous substances released into the environment. It also provides national, regional, and local contingency plans. Applicable emergency operations plans in place include the National Contingency Plan (40 CFR 300, required by section 105 of CERCLA), the Region VIII Regional Contingency Plan, the Colorado River Sub-Area Contingency Plan (these three are Environmental Protection Agency produced plans), the Mesa County Emergency Operations Plan (developed by the Mesa County Office of Emergency Management), and the BLM Grand Junction Field Office Hazardous Materials Contingency Plan.
- Hazardous spill cleanup activities that fall outside the criteria set forth in CERCLA still require the submission of a Preconstruction Notice to the US Army Corps of Engineers, and may be subject to Nationwide Permit Number 38.

- The Resource Conservation and Recovery Act (RCRA) (Public Law 94-580, October 21, 1976) regulates the use of hazardous substances and disposal of hazardous wastes. Note: While oil and gas lessees are exempt from RCRA, right-of-way holders are not. RCRA strictly regulates the management and disposal of hazardous wastes.

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

The project area is part of the Rifle Municipal Watershed, and must satisfy town administrators that activities will not impact Rifle's water quality before a permit can be granted. A portion of the alternative road to the C26NW pad crosses through the 300-foot source water buffer established by the Colorado Oil and Gas Conservation Commission (COGCC) in 2009, and may trigger additional permitting requirements. A spring and small wetland are also present where the road crosses the unnamed tributary to Dry Creek, which could be impacted by a spill or leak near this crossing.

### Environmental Consequences

#### *Proposed Action*

Possible pollutants that could be released during the construction phase of this project would include diesel fuel, hydraulic fluid, and lubricants. These materials would be used during construction of the road, pad, and pipeline and for refueling and maintaining equipment and vehicles. Potentially harmful substances used in the construction and operation would be kept onsite in limited quantities and trucked to and from the site as required. No hazardous substance, as defined by 40 CFR 355 would be used, produced, stored, transported, or disposed of in amounts above threshold quantities.

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

Refer to Appendix D for standard and site-specific Conditions of Approval (COAs) that would prevent or mitigate introduction of hazardous substances into surface waters. Among these COAs are the following:

- Tanks used to store produced water and condensate would be placed in secondary containment to prevent offsite release.
- Pipelines associated with the transport of these liquids would be pressure tested to detect leakage prior to use.
- Solid waste (garbage, human waste, etc.) generated during construction activities and, to a limited extent, during project operations, would be removed to a landfill or water treatment facility as needed, and all would be removed prior to interim reclamation.

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

#### *Alternative Road and Pipeline*

Impacts due to releases or spills of hazardous or solid wastes into the environment under this alternative would be comparable to those under the Proposed Action. Overall, however, risks would be somewhat less because the alternative road alignment would not involve a crossing of the unnamed tributary to Dry Creek or an intersection of the L26NW access road with the GMHOA Road.

#### *No Action Alternative*

The No Action alternative would result in no impacts from releases or spills of hazardous or solid wastes into the environment, because none of the project components would be built and operated.

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

#### ***Surface Water and Waters of the U.S.***

##### Affected Environment

The project area is located within the Colorado Headwaters-Plateau (HUC 14050006) drainage basin unit (EPA, 2007). The climate of this unit is semiarid: annual precipitation ranges from less than 16 inches in the project area to more than 30 inches at the higher elevations near the drainage divide to the south (Robson and Banta, 1995). Thus, perennial surface water flow is limited to larger streams. The project area lies entirely within the Colorado River Above Rifle sub-basin. An unnamed ephemeral drainage that passes through the project area is a tributary of Dry Creek, which is a of the Colorado River.

According to the *Stream Classifications and Water Quality Standards* (CDPHE, Water Quality Control Commission [WQCC] Regulation No. 37) (CDPHE 2007), Dry Creek and its tributaries are within segment 4a, which includes all non-perennial tributaries to the Colorado River from its confluence with the Roaring Fork River to a point immediately below its confluence with Parachute Creek. Following is a brief description of segment 4a.

- Segment 4a – This segment has been classified aquatic life cold 2, recreation 2, water supply, and agriculture. Aquatic life cold 2 indicates that this water course is not capable of sustaining a wide variety of cold or warm water biota due to habitat, flows, or uncorrectable water quality conditions. Recreation class 2 refers to waters that are not suitable or intended to become suitable for primary contact recreation. This segment is, however, suitable or intended to become suitable for potable water supplies and agricultural purposes that include irrigation and livestock use.

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

The existing GMHOA access road parallels the unnamed ephemeral tributary to Dry Creek to the west, which is tributary to the Colorado River north of the project area. The proposed access road and gathering lines crossing the GMHOA road would also cross this tributary, a designated "Water of the

U.S.” as defined by the U.S. Army Corps of Engineers (USACE) in 33 CFR Part 328 (Figure 4). The alternative road also crosses a deep, ephemeral drainage that may be classified as Waters of the U.S., but the pipeline in this alternative would bypass this drainage (Figure 4).

Section 404 of the Clean Water Act requires a Department of the Army permit from the USACE prior to discharging dredged or fill material into waters of the United States as defined by 33 CFR Part 328. A “404” permit is required for both permanent and temporary discharges into waters of the United States; larger discharges require an individual permit, while smaller discharges may be granted a nationwide permit (NWP). Utility line crossings of Waters of the U.S. and associated wetlands fall under USACE NWP 12, while road crossings are covered under NWP 14; small discharges into Waters of the US that are not associated with either of the above (e.g., for pad construction) may instead fall under NWP 18.

### Environmental Consequences

#### *Proposed Action*

Potential impacts to surface water associated with the Proposed Action include increased erosion and sedimentation of streams due to changes in channel morphology due to road and pipeline crossings, and contamination by drilling fluids, produced water, or condensate. Clearing and grading of stream banks, and placement of fill for access roads in stream channels could affect surface waters through increased sedimentation and releases of chemical pollutants from sediments. A reduction in stream bank integrity could increase stream bank erosion. Suspended sediment during flow events would increase until disturbed areas were stabilized by reclamation. The greatest sediment load would occur immediately downstream of stream crossings, and suspended sediment concentration would progressively decrease downstream as the large sediment particles were deposited in the channel bed.

Near-surface soil compaction caused by construction equipment and vehicles could reduce the soil’s ability to absorb water and could increase surface runoff and the potential for ponding. The magnitude and duration of potential impacts to surface runoff would depend on soil depth, susceptibility of a particular soil type to erosion, vegetative cover, slope aspect and gradient, erosive force of rainfall or surface runoff, and duration and extent of construction activities. Surface waters would be most susceptible to sedimentation during construction, drilling, and completion activities, which would collectively last approximately 45 days. After this period, reclamation activities would substantially reduce surface exposure, decreasing the risk to surface waters over the long term.

Although surface waters would be most susceptible to sedimentation over the short term, any access road would remain in place over the life of the wells (i.e., 20 to 30 years) and would channel runoff during periods of precipitation. Sedimentation and stream channel impacts associated with any road would be reduced through the implementation of Best Management Practices (BMPs) and other preventive measures. As proposed, these measures would include limiting cut slope steepness along certain road segments, step-cutting, limiting road grade to 11%, crowning road surfaces, and installing culverts and drainage systems.

Other elements of the Proposed Action are designed to mitigate risks to surface waters associated with the release of drilling fluids, produced water, and condensate. The reserve pit used to contain drilling fluids would be lined to prevent infiltration into surrounding soils. Once completion operations are complete, excess liquids would be allowed to evaporate, and backfilling of the pit would be performed in a manner that would avoid incorporating the mud into surface soils.

Tanks used to store produced water and condensate would be placed in secondary containment to prevent offsite release. In the event of an accidental release, produced water and condensate would be confined

for cleanup in a containment area to prevent migration to surrounding soils or surface waters. Pipelines associated with the transport of these liquids would be pressure tested to detect leakage prior to use.

To minimize discharge of sediment into stream channels, all construction in the Proposed Action would occur outside the spring runoff season. Refer to Appendix D for standard and site-specific Conditions of Approval that would mitigate impacts to surface water. Through the use of BMPs and other COAs associated with construction activities, prompt interim reclamation, and the implementation of the preventative measures associated with the treatment of fluids, impacts to surface waters would be minimized and should be minor.

#### *Alternative Road and Pipeline*

Potential for adverse impacts to surface waters under this alternative would be generally comparable to those under the Proposed Action. Risk of impacts would be decreased by avoiding the need to cross the unnamed tributary to Dry Creek, which could serve as a transport pathway of sediments and chemical pollutants into the Colorado River. However, risk of impacts would be increased slightly by the longer road length and partially separate pipeline alignment. Total short-term ground disturbance in this alternative would be approximately 15.0 acres, vs. 16.1 acres in the Proposed Action.

#### *No Action Alternative*

Because the No Action alternative would not involve implementing any of the project components, it would result in no adverse impacts to surface waters.

#### ***Groundwater***

##### Affected Environment

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

The project area is in the lower Piceance Basin aquifer system. The Piceance Basin contains both alluvial and bedrock aquifers. Unconsolidated alluvial aquifers are the most productive aquifers in the Piceance Basin. The groundwater exists in shallow, unconsolidated alluvium associated with the Colorado River (BLM 2006) and consists of unconsolidated boulders, cobbles, gravel, sand, silt, and clay. The thickness of the alluvium is variable, but tends to be thinner at the basin margins due to increased slopes and higher flow velocities and thicker in the lower reaches where alluvium can accumulate. Typical alluvial well depths are less than 200 feet, with water levels ranging from 50 to 100 feet. The quality of alluvial groundwater in the Colorado River Basin varies widely and is affected by return flow quality, mineral weathering and dissolution, cation-anion exchange with alluvial minerals, and organic compound loading from leaching of fertilizers and pesticides.

The most important bedrock aquifers are the upper and lower Piceance Basin aquifer systems. These consolidated bedrock aquifers occur within and above the large oil shale reserves. The upper and lower aquifers are separated by the Mahogany Zone of the Parachute Creek Member of the Tertiary Green River Formation. The Mahogany Zone is a poorly permeable oil shale, which effectively serves as an aquitard. Both bedrock aquifers overlie the older Cretaceous Mesaverde Group, the target zone of the subject wells. South of the Colorado River, these upper Tertiary-age aquifers have largely been eroded off, exposing the lower Green River and Wasatch Formations. The surface formation of the proposed pad is the Wasatch Formation.

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

According to the CDWR, four fresh-water wells are located within a 0.5-mile radius of the proposed activities, one of which is found within a 0.25-mile radius. The nearest fresh water well is located approximately 1,250 feet southwest. Listed as a monitoring hole, no quantitative data is found for this well. The Grass Mesa water quality COA will apply to this well (see Downhole Conditions of Approval for testing requirements of fresh water wells found within a 0.25-mile radius of proposed well sites located on Grass Mesa). Only one of the four wells identified is defined by a quantitative well record. Located approximately 2,172 feet northwest, this monitoring well shows a well depth of 160 feet, a water level of 105 feet, and a water yield of 6 gallons per minute (gpm). Numerous fresh water wells are found predominately west and northwest of this well pad. The Grass Mesa area has numerous ranch residences and agricultural operations serviced by private wells. Wells checked within a 1-mile radius show well depths ranging between 143 feet deep at the shallowest, to 340 feet at the deepest. Water levels ranged from 69 to 192 feet. Water yields were poor to good, ranging from 3 to 15 gpm. Shallow well depths indicate these wells are likely completed in alluvial aquifers. Surface casing will be set between 1,252 and 1,271 feet measured depth, and all potentially useable water zones would be protected.

### Environmental Consequences

#### *Proposed Action*

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

#### *Alternative Road and Pipeline*

Risks to groundwater quality and quantity would be associated primarily with drilling and completion activities rather than surface-disturbing activities. Therefore, the Alternative Road and Pipeline, which would involve the same number of oil and gas wells in approximately the same location as the Proposed Action, would also involve the same minimal level of risks to groundwater resources.

#### *No Action Alternative*

The No Action alternative would result in no adverse impacts to groundwater. Although Fee wells do not require BLM approval, these wells could not be drilled in their currently proposed locations because the

pad, road, and pipeline on or across BLM land would require BLM approval. The No Action alternative would constitute denial of all BLM-related components.

#### Analysis of Public Land Health Standard 5 for Water Quality

With proper water body crossing and stream bank restoration techniques, sediment and erosion control measures, spill prevention practices, and successful revegetation of disturbed areas, implementation of the Proposed Action, Alternative Road and Pipeline, or No Action alternatives would be unlikely to prevent Standard 5 from being achieved.

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

#### Affected Environment

Floodplain habitats occur along the intermittent drainages of the Upper Colorado River Basin, but no floodplain habitat would be impacted by the Proposed Action. Only localized wetland habitats or riparian zones exist in the project area. Only one small, seep-fed wetland is in proximity to any proposed activity, at the location where the access road in the Proposed Action crosses the unnamed intermittent tributary to Dry Creek. This wetland has associated riparian vegetation, which continues for a short distance downstream.

#### Environmental Consequences

##### *Proposed Action*

The only direct impacts from the Proposed Action to wetlands or riparian zones would occur at the above-mentioned stream crossing, including burying a small portion (less than 0.1 acre) of this wetland beneath road fill. Impacts to this wetland would be mitigated through the following:

- Aligning the road so that it crosses at the driest spot, where the wetland exists in just one of two stream branches;
- Careful implementation of BMPs and other standard COAs (Appendix D);
- Site-specific COAs, in particular the placement of a layer of geotextile beneath the fill, covered by at least 6 inches of gravel, to allow seepage to more readily pass through without degrading the fill or entraining sediment that would then be delivered to the wetland downstream;
- Monitoring the performance of the above measures over a period of one year; and
- The requirement that this crossing receive a USACE Nationwide Permit (NWP Number 14) prior to commencement of road construction.

Indirect and cumulative impacts, especially the transport of sediment to downstream floodplains, should be insignificant assuming that the above measures are properly implemented.

##### *Alternative Road and Pipeline*

This alternative would not cross any wetlands or riparian zones, and thus would not cause any direct adverse impacts to wetlands or riparian zones. Indirect impacts could still occur if uncontrolled sediment

reached wetlands or riparian areas downstream of the project area, but such impacts would likely be avoided assuming the COAs in Appendix D are properly implemented.

*No Action Alternative*

Because the No Action alternative would not involve implementing any of the project components, it would result in no adverse impacts to wetlands or riparian zones.

Analysis of Public Land Health 2 Standard for Riparian Systems

Wetlands and riparian habitats would receive minor impacts as a result of the Proposed Action. Direct impacts would be limited to an area smaller than 0.1 acre, while indirect impacts may continue downstream if sediment from road construction escapes BMPs placed at the site. However, if all mitigation measures are implemented, the small area impacted by the proposed action should not prevent Standard No. 2 from being met. The Alternative Road and Pipeline and the No Action alternative would cause no direct impacts to wetlands or riparian areas, thus these alternatives would also not prevent Standard No. 2 from being met.

**Other Affected Resources**

In addition to the critical elements, the resources presented in Table 7 were also considered.

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

**Access and Transportation**

Affected Environment

As described in detail in the Proposed Action, the access route to the L26NW pad would be up onto Grass Mesa along the GMBLM Road, across Grass Mesa using existing HOA roads, and across the 0.8 mile of new access road, which would cross the GMHOA Road. The 18-foot-wide travelway with inter-visible turnouts would be constructed, graveled and maintained per the engineered road design. The Traffic Control Plan outlined in Appendix C would be implemented during the drilling, completion, drill-out and reclamation periods for the seven planned wells.

The Alternative Road and Pipeline route, however, would provide vehicle access to the L26NW pad from CR319 on the valley floor. The fluids generated from the L26NW wells would be piped down to the C26NW pad. Traffic associated with the alternative route would not affect the GMHOA Road or the subdivision.

Environmental Consequences

*Proposed Action*

The Proposed Action would result in a marked increase in truck traffic across Grass Mesa and the GMHOA Road during the drilling and completion work related to the planned seven wells. The largest increase would be during rig-up, drilling, and completion activities. Data indicate that approximately 1,160 truck trips over a 30-day period would be required to support the drilling and completion of each well (Table 5). Since the storage tanks serving the produced water and condensate generated from the seven wells would be placed near the valley floor on the existing C26NW pad, there would be a marked reduction in truck traffic during the production stage of the wells (producing life of well in the area can last 30 years). The majority of the expected truck traffic to the L26NW pad during the producing periods of the wells would be vehicles conducting monitoring or maintenance activities tied to the wellheads, separators, pipeline pig launcher or remote sensing equipment. Each well may have to be recompleted once per year with a workover rig and its supporting vehicles and equipment, typically averaging to five truck trips per day for approximately seven days.

<b>Table 5. Traffic Associated with Drilling and Completion Activities<sup>8</sup></b>		
<i>Vehicle Class</i>	<i>Number of trips per well</i>	<i>Percentage of total</i>
16-wheel tractor trailers	88	7.6%
10-wheel trucks	216	18.6%
6-wheel trucks	452	39.0%
Pickup trucks	404	34.8%
Total	1,160	100.0%
Source: BLM 2006. Note: Trips by different vehicle types are not necessarily distributed evenly during the drilling process. Drilling and completion period is approximately 30 days per well.		

The road design package was developed using BLM’s Best Management Practices outlined in the Gold Book, *Surface Operating Standards for Oil and Gas Exploration & Development* (BLM 2006b). Degradation of field development and HOA roads may occur due to heavy equipment travel, and fugitive dust and noise would be created. Mitigation measures (see Appendix D) would be required as conditions of approval to ensure adequate dust abatement and road maintenance occur.

The construction of the new road to the pad would create a short-term initial surface disturbance of 6.5 acres reduced to a long-term disturbance of 2.2 acres after acceptable reclamation becomes established on the road cut-and-fill slopes.

### *Alternative Road and Pipeline*

With the access road serving the L26NW pad originating from the valley floor off CR319 near the C26NW pad, there would be virtually no truck traffic impacts to the Grass Mesa subdivision. The GMHOA Road would not be directly impacted, because the alternative route would generally parallel the GMHOA Road. Fluids generated from the L26NW wells would be piped down to the C26NW pad.

The road would be constructed using BLM's Best Management Practices outlined in the Gold Book, *Surface Operating Standards for Oil and Gas Exploration & Development* (BLM 2006b). Degradation of field development roads may occur due to heavy equipment travel, and fugitive dust and noise would be created. Mitigation measures (see Appendix D) would be required as conditions of approval to ensure adequate dust abatement and road maintenance occur. The steep sideslope portions of the Alternative Route would be constructed using end-haul techniques that restrict sidecasting.

Short-term disturbance associated with the Alternative Road/ Pipeline would amount to 8.7 acres, reduced to a long-term disturbance of 3.2 acres following completion of construction.

### *No Action Alternative*

This alternative would not access or transportation, because no project components would be built.

## **Geology and Minerals**

### Affected Environment

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

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

The proposed drilling project would target sandstone layers within the Williams Fork (including the Cameo Coal and un-named sandstones) between 6,544 and 8,664 feet TVD. The Williams Fork Formation sandstones are considered "tight" because of their low permeability reservoir characteristics. Individual sandstones are stacked and concentrated into 400- to 500-foot-thick potentially productive sequences, and distributed throughout a vertical interval of about 3,000 feet. Although these particular wells would be located within the Mamm Creek Field, studies of the adjacent Rulison Gas Field located further west show that these Williams Fork sandstones have limited horizontal extent, based on the lack of pressure communication between existing wells spaced less than 1,000 feet apart (Vargas 2006).

### Environmental Consequences

### *Proposed Action*

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

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

### *Alternative Road and Pipeline*

Impacts to geologic and mineral resources under the Alternative Road and Pipeline scenario would be the same as under the Proposed Action, described above. These potential impacts are associated primarily with drilling and completion of oil and gas wells, which would be the same under these two options.

### *No Action Alternative*

Under the No Action alternative, ground disturbance associated with drilling and production of the Fee wells could not occur because the pad, road, and pipeline would require BLM approval, which would not be granted under this alternative.

## **Noise**

### Affected Environment

The Proposed Action would lie within a rural setting characterized by fairly recent natural gas development activities. Noise levels in the area are presently created by traffic serving existing wells and ongoing drilling and completion activities.

Noise is generally described as unwanted sound, weighted and noise intensity (or loudness) is measured as sound pressure in units of decibels (dBAs). The decibel scale is logarithmic, not linear, because the range of sound that can be detected by the human ear is so great that it is convenient to compress the scale to encompass all the sounds that need to be measured. Each 20-unit increase in the decibel scale increases the sound loudness by a factor of 10.

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

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

Interstate 70 is the only high-speed road within the vicinity of the plan area, and it does not contribute to the existing noise levels because of its distance from the area. Roadway traffic on county roads and BLM roads in the HGMDP area contributes to noise, but this source is transient, produced primarily by vehicles used for exploration and maintenance.

### Environmental Consequences

#### *Proposed Action*

The road in the Proposed Action would pass within approximately 850 feet (0.15 mile) of the closest residence, while the L26NW pad would be located approximately 1200 feet (0.25 mile) from the nearest residence.

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

Short-term (7- to 14-day) increases in noise levels would occur during road and pad construction. Based on the Inverse Square Law of Noise Propagation (Harris 1991) and an average construction site noise level of 65 dB(A) at 500 feet (Table 9), construction noise would equal approximately 59 dB(A) at 1,000 feet. At 1,000 feet, noise levels would approximate those of an active commercial area (EPA 1974).

Noise impacts from drilling and completion activities would last approximately 45 to 60 days at each well. Noise would occur continuously, 24 hours per day, during the drilling and completion period. These increased noise levels would be in addition to levels of noise that are already above background levels due to current oil and gas developments in the area.

Traffic noise levels would also be elevated as a consequence of the Proposed Action. The greatest increase would be along the access road during the construction, drilling, and completion phases. Based on the La Plata County data presented in Table 9, approximately 68 dB(A) of noise (at 500 feet) would be created by each fuel and water truck that travels these roads. Less noise would be created by smaller trucks and passenger vehicles such as pickup trucks and sport utility vehicles. Although the duration of increased noise from this source would be short, it would occur repeatedly during drilling and completion.

<b>Table 9. Noise Levels Associated with Oil and Gas Production and Development</b>				
<i>Equipment Type</i>	<i>Noise Level at 50 feet (dBA)</i>	<i>Noise Level at 500 feet (dBA)</i>	<i>Noise Level at 1000 feet (dBA)</i>	<i>Noise Level at 2000 feet (dBA)</i>
Crane	88	68	62	56
Backhoe	85	65	59	53
Pan Loader	87	67	61	55
Bulldozer	89	69	63	57
Fuel and Lubrication Truck	88	68	62	56
Water Truck	88	68	62	56
Motor Grader	85	65	59	53
Vibrator/Roller	80	60	54	48
Mechanic Truck	88	68	62	56
Flat Bed Truck	88	68	62	56
Dump Truck	88	68	62	56
Flat Bed Trailer	88	68	62	56
Tractor	80	60	54	48
Concrete Truck	86	66	60	54
Concrete Pump	82	62	56	50
Front End Loader	83	63	57	51
Road Scraper	87	67	61	55
Air Compressor	82	62	56	50
Average Construction Site	85	65	59	53
Source: La Plata County (2002)				

Noise impacts would decrease during the production phase. These levels would be less than during the construction phase, but greater than background noise levels. During maintenance and workovers, noise levels would increase above those associated with routine well production. Traffic noise level would impact residences located along county roads that would provide primary access into the area. Typical production noise levels are listed in Table 10. While exposure to these noise levels is not likely to be harmful, it is likely to be annoying to residents.

**Table 10. Noise Levels Associated with Oil and Gas Activity**

<i>Noise Source</i>	<i>Sound Level at 50 Feet*</i>
Well drilling	83 dB(A)
Pump jack operation	82 dB(A)
Produced water injection facilities	71 dB(A)
Gas compressor facilities	89 dB(A)
Source: Woodward-Clyde 1988 Raw noise data. Portland, Oregon.	
Note: *Sound levels are based on highest measured sound levels normalized to a distance of 50 feet from the source.	

### *Alternative Road and Pipeline*

This alternative would have noise impacts approximately equal to those of the Proposed Action due to comparable areas of disturbance, time of drilling and completion, and distance from residences.

### *No Action Alternative*

This alternative would not have an impact on noise levels, because the development activities would not occur.

## **Recreation**

### Affected Environment

*Recreation Setting Character.* For recreation planning and management, possible mixes of activities, settings, and probable recreation experience opportunities have been arranged in a continuum called the Recreation Opportunity Spectrum (ROS). The ROS is divided into six classes: Primitive, Semi-Primitive Non-Motorized, Semi-Primitive Motorized, Roaded Natural, Rural, and Urban. An inventory of the Resource Area was conducted by the BLM for the 1984 Resource Management Plan (RMP) for the Glenwood Springs Field Office. The ROS in the RMP is used to portray settings and opportunities, not to manage recreation settings to produce explicit recreation opportunities.

The Project Area is located within the Roaded Natural (RN) ROS class. The RN class is described as having (1) an equal opportunity to affiliate with other users or to be isolated from the sights and sounds of man, (2) an opportunity to have a high degree of interaction with the natural environment, (3) an ability to practice outdoor skills may be important, and (4) opportunities for both non-motorized and motorized recreation.

*Existing Recreation Activities.* A small, informal path, apparently for horse use, runs along the ridge going northeast from the proposed pad location. This path shows no signs of regular recent use, although it appears that someone has made an effort to remove stones and line the edge of the path.

*Recreation Facilities.* No developed recreational facilities such as campgrounds, picnic areas, or maintained hiking/biking trails are present in the vicinity of the Proposed Action. Several unmaintained dirt roads provide informal recreation opportunities for off-highway vehicle driving/riding in the project area.

*Commercial Recreation Use.* No commercial outfitters hold permits for the area.

### Environmental Consequences

*Recreation Setting Character.* The Proposed Action will not change the current ROS status of Roaded Natural. The RN setting is characterized by a moderate evidence of the sight and sound of humans. Resource modifications and uses are evident, but should harmonize with the natural environment.

Implementation of measures to mitigate impacts to visual resources (see Visual Resources section) would indirectly help mitigate impacts to naturalness.

*Recreation Activities.* The proposed pipeline would remove the small, informal path. Construction and well-drilling activities would likely deter recreation activities in the area. After the pad is established, recreation activities would likely return.

Commercial Recreation Use. The direct and indirect consequences on recreation opportunities for the clients of the commercial permittees parallel those of the non-guided public land user.

#### *Alternative Road and Pipeline*

Impacts to recreation character, activities, facilities, or commercial under this alternative would be generally the same as described above for the Proposed Action.

#### *No Action Alternative*

Under the No Action alternative, the access road, pad, and pipeline would not be constructed. Therefore, this alternative would result in no impacts to recreational opportunities. The informal path would stay and those who currently recreate in the area would continue uninterrupted.

### **Paleontology**

#### Affected Environment

The predominant surface formation that underlies the L26NW well pad is the Wasatch Formation (including Ft. Union Formation at base) and Ohio Creek Formation (Two). Isolated areas of Quaternary older gravels and alluvium (Qgo), consisting of terrace, outwash, and pediment gravels, are interspersed throughout the surrounding area. Older Gravels and Alluvium of pre Bull Lake Age surround the proposed well pad site and cover older Wasatch Formation sediments. Occurring in varying thicknesses, these Quaternary sediments are considered Potential Fossil Yield Classification (PFYC) Class 2, defined as having a low probability of fossil occurrence. Class 2 geologic units are not likely to contain vertebrate or scientifically significant vertebrate, invertebrate, or plant fossils.

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

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

#### Environmental Consequences

Although the Wasatch Formation is mapped as the predominant surface formation, the proposed well pad is located on the edge of a historical use grazing pasture. Field inspection did not reveal Wasatch bedrock exposures within the immediate area. The area surrounding the well sites is obscured in heavy vegetation consisting of sagebrush and oak brush. Construction activities do have the potential to adversely affect important fossils that may be present in the Wasatch Formation once the soil cover is removed, with the. The greatest potential for impacts is associated with the excavation of shallow bedrock that may be

unearthed during facilities construction. In general, agricultural use areas covered with thick vegetation and soil cover and are much less likely to contain well-preserved plant and animal remains than intact native sediments.

An examination of the BLM paleontology database indicates that there are three fossil discovery sites identified within a 1-mile radius of the proposed well sites. The nearest identified site, located in Section 35, is approximately 4,500 feet southeast of the proposed activities. One additional site is found approximately 864 feet southwest of that site. The third site is located in Section 34, approximately 5,000 feet southwest. Given the historical use of this area, agricultural in nature, the potential for discovering new fossil sites is highly unlikely. In the event paleontological resources are encountered, a standard paleontological COA would be attached to the APDs (see Appendix C, Number 15).

#### *Alternative Road and Pipeline*

The potential for adverse impacts to fossil resources under this alternative is essentially the same as under the Proposed Action, described above—i.e., minimal.

#### *No Action Alternative*

Under the No Action alternative, none of the project components would be built—including Fee wells—because BLM would not approve a pad, road, or pipeline on BLM land. Therefore, this alternative would result in no impacts to fossil resources.

### **Socio-Economics**

#### Affected Environment

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

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

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

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

estimated to be as much as \$1 million annually, with perhaps an additional \$1 million annually of indirect and local expenditures (CDOW 1995, cited in BLM 2006).

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

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

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

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

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

## Environmental Consequences

### *Proposed Action*

The Proposed Action would positively impact the local economies of Garfield County through the creation of additional job opportunities in the oil and gas industry and in supporting trades and services. In addition, local governments in Garfield County would experience an increase in tax and royalty revenues. Some minor economic loss to private landowners or guides may result from the potential displacement of big game and resulting reduction in big game hunting within the project area.

The Proposed Action could result in minor negative social impacts including (1) a negligible decrease in the recreational character of the area (see Recreation); (2) reduced scenic quality (see Visual Resources); (3) increased dust levels, especially during construction (see Air Quality); and (4) increased traffic (see Transportation).

### *Alternative Road and Pipeline*

The impacts associated with this alternative would be similar to the impacts identified in the Proposed Action

### *No Action Alternative*

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

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

### Affected Environment

According to the *Soil Survey of Rifle Area, Colorado* (USDA 1985), the proposed activities would be located on two soils, described below.

The L26NW pad and a short segment of the road in the Proposed Action would be constructed on Vale silt loam, 3 to 6 percent slopes. This soil is found on mesas, terraces, and alluvial fans between 5,000 and 7,200 feet. The surface layer is typically silt loam about 7 inches thick, while the subsoil is silt loam and silty clay loam about 19 inches thick. Permeability is moderate, surface runoff is medium, and the erosion hazard is moderate. This soil is used mainly for irrigated crops and hay.

Most of the road in the Proposed Action, as well as the entire Alternative Road and Pipeline, would be constructed on Torriorthents-Rock outcrop complex, steep. This broadly-defined unit is found on the sides of mesas and mountains throughout the area. The surface layer, where present, is clayey to loamy and contains variable amount of gravel, cobbles, and stones. Rock outcrops are mainly Mesaverde sandstone and Wasatch shale. Erosion hazard is moderate to severe.

## Environmental Consequences

### *Proposed Action*

The Proposed Action would result in the short-term loss of approximately 16.1 acres of vegetation; of this, approximately 3.4 acres would not be reclaimed during the life of the wells. In general, the area that would be affected by the Proposed Action contains adequate vegetation buffers and moderate (10 to 35%) slopes that would reduce the potential for sediment transport. However, construction activities would

cause slight to moderate increases in local soil loss, loss of soil productivity, and sediment available for transport to surface waters. Potential for such soil loss and transport would increase as a function of slope, feature (pad, road, or pipeline route) to be constructed, and proximity to streams.

Throughout the affected area, the potential would also exist for accidental spills or leaks of petroleum products and hazardous materials during construction. These events would cause soil contamination and an associated decrease in soil fertility and revegetation potential.

Such impacts should be adequately mitigated by proper utilization of the standard and site-specific COAs listed in Appendix D. Following interim reclamation, it will be the responsibility of the operator to continue revegetation/reclamation efforts until vegetative communities on disturbed surfaces are composed of seeded or other desirable vegetation, as determined by the BLM. Appropriate revegetation is important to prevent or minimize soil erosion and infestation of weeds.

#### *Alternative Road and Pipeline*

This alternative would result in the short-term loss of approximately 15.0 acres of vegetation; of this, approximately 4.4 acres would not be reclaimed during the life of the wells. While these areas are comparable to those of the Proposed Action, the steeper nature of much of this road alignment would necessitate larger cuts and removal of a greater amount of soil per road length compared to the Proposed Action. Depending on bedrock hardness and cohesion, blasting may also be needed along the central segment of this road. Even if blasting is not required, standard excavation with a trenching machine or excavator may be slowed considerably. Furthermore, there is the potential for mixing of soil horizons, which could reduce soil fertility and hinder revegetation potential. As a result, this alternative is likely to have a somewhat larger impact on soils than would the Proposed Action.

#### *No Action Alternative*

In the No Action alternative, the project components would not occur. Therefore, this alternative would have no impact on soils.

#### Analysis of Public Land Health Standard 1 for Upland Soils

Since no land health survey has been performed for this area, the effects of this project on Public Land Health status in this area are uncertain. However, successful topsoil handling procedures, erosion control methods, and restoration measures during construction and restoration activities should prevent both the Proposed Action and Alternative Road and Pipeline from negatively impacting this land health standard.

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

##### Affected Environment

The project is located within a juniper woodland community with a minor component of pinyon pine. Dominant shrub species include sagebrush (*Artemisia tridentata*), snakeweed (*Gutierrezia sarothrae*), and mountain-mahogany (*Cercocarpus montanus*) in rocky areas with shallow soils.

The sparse herbaceous layer in the juniper woodland consists of graminoids such as squirreltail (*Elymus elymoides*), Indian ricegrass (*Achnatherum hymenoides*), and cheatgrass, a noxious weed, as well as a variety of forbs including rock goldenrod (*Petrorhiza pumila*), miner's candle (*Oreocarya* sp.), Osterhout's penstemon (*Penstemon osterhoutii*), twistflower (*Streptanthus cordatus*), and rose heath (*Chaetopappa ericoides*). Cacti encountered include claret cup cactus (*Echinocereus triglochidiatus*),

prickly pear cactus (*Opuntia polyacantha*), and the occasional Simpson hedgehog cactus (*Pediocactus simpsonii*).

### Environmental Consequences

#### *Proposed Action*

Total short-term surface disturbance for the Proposed Action would be approximately 16.1 acres of BLM land. With implementation of reclamation practices identified in Appendix D, establishment of desirable herbaceous vegetation on the unused portions of the pad, pipeline, and road could be restored within 2 to 3 years. The establishment of mature shrubs could take from 5 to 25 years, and the establishment of trees would take even longer. Interim reclamation would result in a reduction in surface disturbance of the pad that would remain over the long-term life of the project. Assuming that the pad and road are reclaimed to the extent possible, total long-term surface disturbance associated with the Proposed Action would be approximately 3.4 acres of BLM land.

#### *Alternative Road and Pipeline*

Total short-term surface disturbance for the Alternative Road and Pipeline would be approximately 15.0 acres of BLM land, resulting in similar disturbance impacts when compared to the Proposed Action. Assuming the pad and road are reclaimed to the extent possible, total long-term surface disturbance associated with the Alternative would be approximately 4.4 acres of BLM land.

#### *No Action Alternative*

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

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

At this time, the landscape addressed in this EA has not had a formal Land Health Assessment completed. Therefore, no formal determination on conformance with Standard 3 for healthy, productive plant communities will be made until a formal Land Health Assessment and Determination Document is completed. The surface disturbance associated with the Proposed Action and the Alternative Road and Pipeline has the potential to encourage expansion and dominance of the site by non-native invasive weeds. The COAs in Appendix D include provisions for revegetating disturbed areas in a manner to reestablish desirable native vegetation and control noxious weeds.

Based on the above, the Proposed Action and the Alternative Road and Pipeline would probably contribute at a minor level to the further deterioration of vegetation communities and would move the area farther from achieving conformance with the standard. In comparison, the No Action alternative would not contribute to the further deterioration of vegetation communities and would not move the area further away from achieving conformance with Standard 3 because no project components would be built.

### **Visual Resources**

#### Affected Environment:

The Proposed Action and Alternative Road and Pipeline would take place on public lands southeast of Rifle, Colorado, south of I-70 and west of CR 319. The existing landscape consists of moderate to steep

hillsides rising out of the river valley to mesas leading up to mountains in the background. The hillsides are visually dominated by dense, dark-green pinyon/juniper plant communities interspersed with patches of tan, exposed soil while the flatter mesa tops and valley floors are comprised of sagebrush meadows and agricultural fields. The Rifle airport lies northeast of the Proposed Action and Alternative Road and Pipeline area. The mesa tops and wider valleys floors are comprised of dispersed residential including the community of Grass Mesa, located directly west of the Proposed Action and Alternative Road and Pipeline, industrial facilities, and a community college campus (Figure 7).

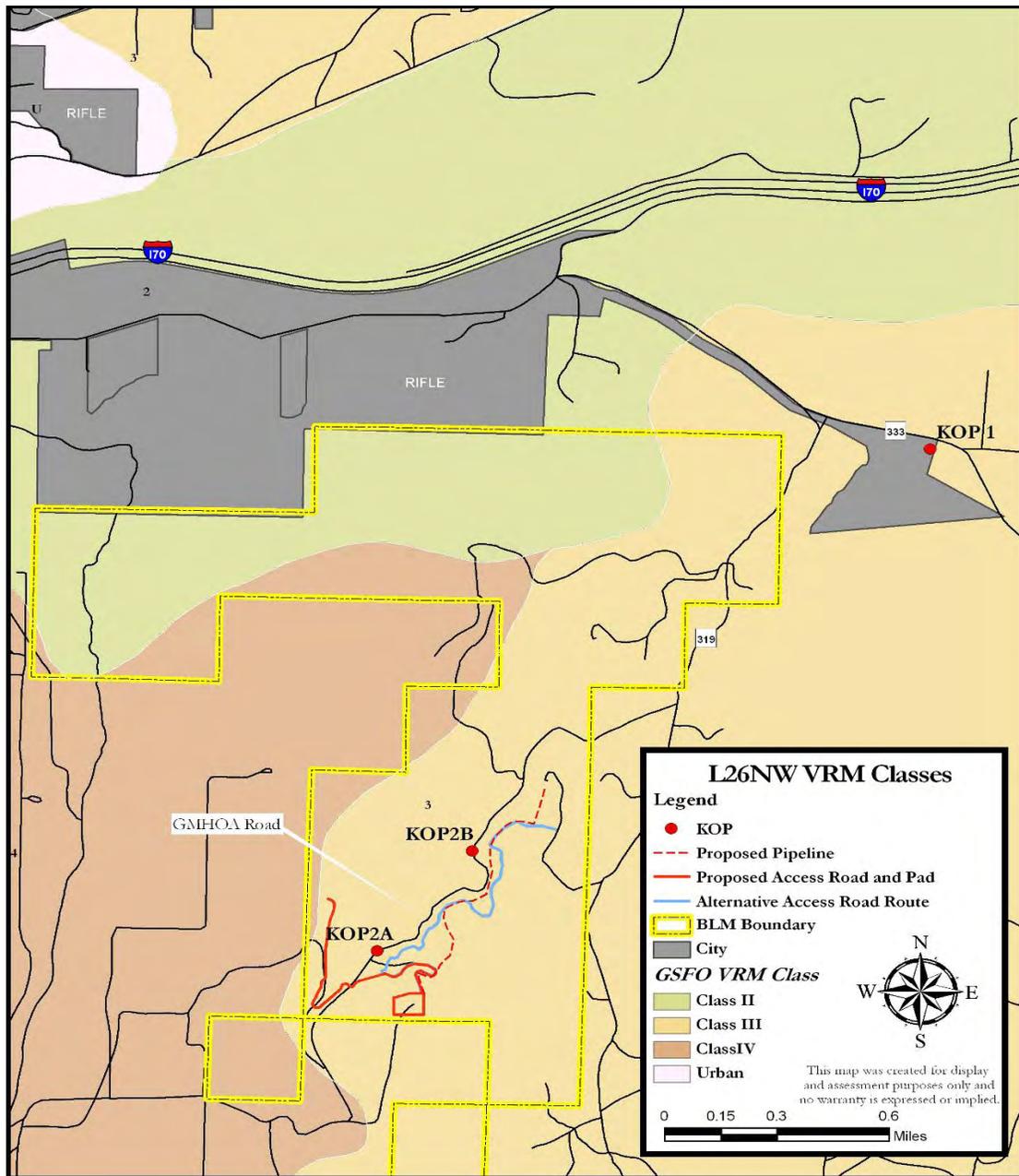


Figure 7: L26NW relationship to Visual Resource Management (V RM) Class Designations

The Proposed Action and Alternative Road and Pipeline alignments would be located in the viewer foreground to middleground, approximately 2.3 to 5 miles from the I-70 corridor, 0.5 to 1.5 miles from Country Road 319, and adjacent the GMHOA Road. BLM guidance states that lands with high visual sensitivity are those within five miles of a primary travel corridor and of moderate to very high visual exposure, where details of vegetation and landform are readily discernible and changes in visual contrast can be easily noticed by the casual observer. The visual exposure from I-70 would be limited to westbound traffic between Silt and Rifle. The Rifle Airport would also have limited visual exposure to the project area. The GMHOA Road runs through the project, and would have exposure to the proposed and alternative alignments. One home is located directly across from the proposed pipeline route, and two homes are located in the vicinity of the proposed pad. Users on CR 333 and CR 319 would have viewpoints of the project area.

The proposed and alternative alignments would traverse areas classified by the BLM as VRM (visual resource management) Class III, as defined by the Glenwood Springs Resource Area 1984 Resource Management Plan (BLM 1984). VRM Classes represent the relative value of the visual resource, providing a basis for considering the visual objectives and defining how the visual resource is to be managed. The proposed access road, pad, associated pipeline, and alternative road alignment would all be located on VRM Class III lands.

The visual impact analysis for this project is based on the views from three selected Key Observation Points (KOPs) representing two linear viewer locations: CR 333 and two along the GMHOA Road, described below. VRM worksheets for the three KOPs are provided in Appendix F.

**KOP 1** is located on CR 333, representing the viewing angle and direction with the highest frequency of viewers, encompassing CR 333, Garfield County Airport, and I-70 observers. The viewer would be looking upward toward the proposed and alternative alignments. The foreground consists of gray-green sagebrush flats with dense, dark-green pinyon/juniper stands draped on the rolling hillsides that rise to the south. The rounded form of Battlement Mesa rises in the background. Large power lines also run through the foreground of the landscape (see upper right corner of photo). The proposed and alternative alignments would be a little less than 2 miles from CR 333, placing it in the foreground to middleground.



*KOP 1*

**KOP 2A** is located on GMHOA Road, representing a location where the Proposed Action alignment would be apparent to travelers. At this location, the viewer would be looking upward toward the proposed alignment; intermittently at other locations along the GMHOA Road, the viewer may be higher than or equal to the proposed alignment. The foreground is dominated by dark-green pinyon/juniper stands draped on the rolling hillsides that rise to the north and south of the GMHOA Road. Valley walls rise steeply on the south side of the KOP and a steep drainage follows along the north side. The Proposed Action is located directly adjacent to KOP 2A, placing it in the immediate foreground on both the north and the south sides.



*KOP 2A*

**KOP 2B** is located on the GMHOA Road, representing the location where the proposed alignment would be visible to travelers. The viewer would be below the alternative alignment at this location but could be higher than or equal to this alignment while driving down the hill. The foreground is dark-green pinyon/juniper draped on the rolling hillsides that rise to the north and south of the GMHOA Road. Valley walls rise steeply on the south side of the KOP, and a steep drainage follows along the north side. The proposed alignment is located adjacent to KOP 2B to the south, in the immediate foreground.



*KOP 2B*

Environmental Consequences:

*Proposed Action*

The planning process involved many sites visits where layout and locations for the pad, pipeline, and access road were reviewed. The project was designed to utilize existing terrain to screen viewer locations as much as possible. Facilities shall be collocated with adjacent pad facilities, to alleviate their very apparent location if placed on the proposed pad. The Proposed Action design calls for a small berm feature as agreed upon between BLM, the operator and the landowner, which shall be created to interrupt the sightline of the proposed pad from an adjacent home.

Short-term visual impacts such as light pollution, dust, and increased traffic from construction, drilling, and completion activities would occur. Long-term visual impacts would be moderate to weak as seen from KOP 1. Visual mitigation measures would be required for the access road to meet Class III requirements when viewed from KOP 2A. The proposed pad would be screened by the upright vegetation located along its periphery to the north, south, and east. The proposed pipeline has been located to take advantage of existing vegetation for screening along the majority of the route. As the pipeline cuts down the slope and runs perpendicular to contours, the cleared 45-foot-wide right-of-way would be visible, although it would be viewed from an inferior position and from a diagonal angle, therefore greatly reducing the actual amount of cleared vegetation apparent to the viewer.

Because the Proposed Action would cross the GMHOA Road, much more of the disturbance would be visible to the viewer than would occur with the alternative alignment. Removal of vegetation to accommodate cut slopes, especially along the road as it climbs up the hillside to the north of the GMHOA Road, would create a geometric void in the existing stands interrupting the form, line, and color. This would result in the Proposed Action being very apparent to the casual observer from KOP 2A.

To meet Class III requirements, the following mitigation measures would be required for the lengths of visible access road:

- Woody vegetation on and below fill slopes shall be preserved to provide screening.
- The upper edge of cut-slopes should undulate and take advantage of opportunities where the existing topography and openings in vegetation provide locations which more gradual contours can be created during reclamation and create the appearance of a more naturally occurring opening in the dense woody vegetation.
- Upright woody vegetation shall be set aside during road construction and then laid back onto the cut-and-fill slopes in a pattern and color that mimic those found in nature. Care should be taken to preserve the canopy while storing and transporting.
- Facilities shall be painted Shadow Gray, a color found in the surrounding natural vertical elements.

Total short-term surface disturbance associated with the Proposed Action—including the road (6.5 acres), pipelines (4.8 acres), and well pad (4.8 acres)—would be 16.1 acres of direct impact occurring on BLM land. The long-term disturbance area for pad and road would amount to 3.4 acres.

### *Alternative Road and Pipeline*

The alternative road and pipeline route were designed to utilize existing terrain to screen viewer locations to the greatest extent possible. Pad design and facility locations would be the same as with the Proposed Action.

Because the Alternative Road and Pipeline route would be located the south and generally above the GMHOA Road, this alternative would be much less visible than the Proposed Action. Short-term visual impacts such as light pollution, dust, and increased traffic from construction, drilling, and completion activities would occur. Long-term visual impacts would be moderate to weak as seen from KOP 1.

Visual mitigation measures would be required for the access road to meet Class III requirements when viewed from KOP 2B, but less so than with the Proposed Action. Portions of fill slopes would occasionally be quite close to the GMHOA Road with no existing vegetation to provide screening. Although exposed earth slopes do occur in the landscape, the proximity of the smooth fill slopes to the viewer would be visually apparent and dominate in sections where the viewer is looking directly at the fill slopes. The removal of vegetation to accommodate cut slopes as the alternative access road passes through pinyon/juniper stands would occasionally create a bold line of removed vegetation in the existing stands interrupting the form, line, and color. The pipeline would lie beneath the road surface most of the way and the sections where it deviates would not be visible.

The alternative road and pipeline route would meet Class III standards with the following mitigation measures:

- Woody vegetation in and below fill slopes shall be preserved to provide screening.
- The upper edge of cut-slopes should undulate and take advantage of opportunities where the existing topography and openings in vegetation provide locations which more gradual contours can be created during reclamation and create the appearance of a more naturally occurring opening in the dense woody vegetation.
- Upright woody vegetation shall be set aside during road construction and then laid back onto the cut-and-fill slopes in a pattern that emulates those found in nature. Care should be taken to preserve the canopy while storing and transporting. The distance the material is carried shall be kept to a minimum.
- Fill slopes in direct view from the GMHOA Road shall have rock and other material placed on them to emulate other exposed slopes in the area.
- Facilities shall be painted Shadow Gray, a color found in the surrounding natural vertical elements.

Short-term disturbance associated with the alternative road and pipeline and the L26NW pad would amount to 15.0 acres. Long-term disturbance would be 4.4 acres.

### *No Action Alternative*

Under the No Action alternative, none of the components of the Proposed Action would be approved. Although the Fee wells would not need approval by BLM, access would have to cross BLM land. The existing visual environment would remain in its current condition, with no new or additional impacts to scenic quality or visual resources.

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

### Affected Environment

Most of the area to be directly affected by the Proposed Action consists of xeric (dry) upland communities, with minor mesic (moist) areas along an unnamed tributary stream that would be crossed by the road and pipeline segment between the proposed L26NW pad and a point near the existing H27NW pad. This drainage receives some spring and seep inflow and thus carries more persistent surface moisture than would otherwise be expected based on the limited upstream drainage area. However, flows are not sufficiently protracted during most years to support a true aquatic community in reaches near the proposed crossing. Use by aquatic organisms is apparently limited to semi-aquatic macroinvertebrates such as water striders or the aquatic larvae of terrestrial macroinvertebrates such as flies, mosquitoes, and midges and perhaps by aquatic larvae of dragonflies and damselflies.

The drainage does not normally support aquatic vertebrates (fish or frogs) or apparently even semi-aquatic vertebrates (toads and spadefoots).

### Environmental Consequences

#### *Proposed Action*

Construction of a road and pipeline across this drainage would not be expected to have a discernible adverse effect on aquatic organisms within the stream or downgradient from it. Direct loss of the stream floor at the road/pipeline crossing would have negligible impacts on the semi-aquatic macroinvertebrates described above. Impacts from inflow of sediment or chemical pollutants from other project components would be also be minor, based on the protective measures incorporated into project design and applied as COAs (see Appendix D).

#### *Alternative Road and Pipeline*

This alternative would avoid most of the direct impacts to aquatic resources because the unnamed drainage would not be crossed by a road or pipeline. A minor risk of inflow of sediments or chemical pollutants from upland areas would exist, comparable to the Proposed Action.

#### *No Action Alternative*

Because no project components would be constructed or operated under this alternative, no adverse impacts to aquatic wildlife would occur.

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

A formal Land Health Assessment has not been completed for the project area watershed. Implementation of either the Proposed Action or the Alternative Road and Pipeline in conjunction with similar activity occurring in the greater watershed would probably trend the area downward somewhat as habitat is lost and fragmented and human use is increased in the area. Because no offsite or indirect impacts are anticipated if applicable COAs (see Appendix D) are implemented, neither the Proposed Action nor the Alternative Road and Pipeline is expected to adversely affect aquatic wildlife or result in a failure of the project area to achieve Standard 4 for special status species.

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

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

#### Affected Environment

Use by terrestrial vertebrates of the project area is mostly limited to species associated with pinyon-juniper woodland. The minor extent of riparian or wetland vegetation along the unnamed tributary drainage to be crossed under the Proposed Action adds marginally to wildlife use of the area. Although characterized by relatively low compositional diversity, pinyon-juniper is nonetheless a relatively rich habitat due to the combination of structural height, periodically abundant food (juniper berry and pine nut) production, variety of insect prey supported, and presence of palatable shrubs in the otherwise sparse understory.

Prevalent terrestrial vertebrate species in the project area include the Neotropical migrant birds discussed previously in the section on Migratory Birds as well as the other taxonomic groups and representative species discussed below.

#### Mammals

Small mammals associated with pinyon-juniper habitats include the rock squirrel (*Spermophilus variegatus*), golden-mantled ground squirrel (*S. lateralis*), least chipmunk (*Tamias minimus*), and Hopi chipmunk (*T. rufus*) in addition to the desert cottontail (*Sylvilagus audubonii*) and a variety of native mice. Rocky bluffs provide habitat for the bushy-tailed woodrat (packrat) (*Neotoma cinerea*). The minor drainage located west of the GMHOA Road is likely to support a different assemblage of native mice and potentially shrew (*Sorex*) species.

Small carnivores potentially present in the area include the long-tailed weasel (*Mustela frenata*), western spotted skunk (*Spilogale gracilis*), and ringtail (*Bassariscus astutus*) in addition to the nearly ubiquitous striped skunk (*Mephitis mephitis*) and raccoon (*Procyon lotor*). All of these species are most likely to occur along the drainage. Larger carnivores expected to occur include the bobcat (*Lynx rufus*) and, along edges and openings, the coyote (*Canis latrans*), as well as the black bear (*Ursus americanus*) and mountain lion (*Felis concolor*)—the latter two less frequently.

The mule deer (*Odocoileus hemionus*) and Rocky Mountain elk (*Cervus elaphus nelsonii*) are two recreationally important species that are common throughout suitable habitats in the region. CDOW has mapped the project area as including winter range for both species. Specific use of areas that would be affected by the Proposed Action or the Alternative Road and Pipeline is likely to vary from year to year, depending on the onset, intensity, and duration of winter conditions, including snow depth and temperature. In severe winters, deer and elk spend more of their time at lower elevations north of the site, where the more gently undulating areas of sagebrush tend to be sunnier and more snow free. In mild winters, deer and elk probably use the project area throughout the season, despite the generally north-facing aspect. Elk especially are known to use the grassy uplands atop Grass Mesa and the areas of oakbrush farther south (upslope) during moderate or mild winters and when moving upward onto National Forest System (NFS) land for the summer.

#### Birds

Perching birds commonly associated with pinyon-juniper include migratory nesters such as the dusky flycatcher, pinyon jay, mountain bluebird (*Sialia currucoides*), American robin (*Turdus migratorius*),

Townsend's solitaire (*Myadestes townsendi*), juniper titmouse, blue-gray gnatcatcher, plumbeous vireo, black-throated gray warbler, chipping sparrow, and lesser. Rocky bluffs support nesting by another migratory species, the rock wren (*Salpinctes obsoletus*). During some years, nomadic flocks of cedar waxwings (*Bombycilla cedrorum*) and Clark's nutcracker (*Nucifraga columbiana*) may be attracted by crops of juniper berries and pine nuts, respectively, during winter.

The minor drainage west of the GMHOA Road, to be crossed by a road and pipeline under this alternative, attracts minor use by additional bird species due to the presence of small areas of cattails, willows, and cottonwoods. These include four migrants: the cordilleran flycatcher, red-winged blackbird (*Agelaius phoeniceus*), warbling vireo, and song sparrow (*Melospiza melodia*).

Birds of prey may nest in larger pinyon or juniper trees, although no raptor nests were found during project-specific surveys. The raptor most likely to occur in the area is a nocturnal species, the great horned owl (*Bubo virginiana*). Two woodland hawks, the Cooper's (*Accipiter cooperii*) and sharp-shinned (*A. striatus*) may also fly through the area in search of small birds or small mammals and could nest in the scattered areas of conifers and aspen. Red-tailed hawks (*Buteo jamaicensis*) are common in the region but generally are not associated with areas of dense and tall woody vegetation.

One gallinaceous species, the wild turkey (*Meleagris gallopavo*), is also common in the area and probably uses the project area as a source of food (juniper berries and pine nuts).

#### Reptiles and Amphibians

The project area is above the elevational range of most reptile species known to occur in Garfield County. Species most likely to occur include the western fence lizard (*Sceloporus undulatus*) and gopher snake (bullsnake) (*Pituophis catenifer*) in rocky or grassy clearings and the western terrestrial garter snake (*Thamnophis elegans*) along the unnamed tributary. Other reptiles potentially present along the creek, although more commonly found at lower elevations than the site, are the milk snake (*Lampropeltis triangulum*) and smooth green snake (*Ophedryx vernalis*).

No amphibians are known or expected to occur onsite based on habitat conditions along the drainage west of the GMHOA Road.

#### Environmental Consequences

##### *Proposed Action*

Removal of 16.1 acres of pinyon-juniper habitat would reduce somewhat the availability of breeding and feeding habitat by the songbird and small mammal species listed above. This also would reduce the amount of cover and prey for avian and mammalian predators. However, the total direct habitat loss would be a minor portion of a very extensive habitat type throughout the site vicinity. Additional, indirect habitat loss would result from avoidance or reduced use of areas surrounding construction or drilling/completion activities and along the road during these periods, this impact would be lessened by the location of project components near an existing roadway. Although current use of the road is light, it represents some amount of disturbance and access by humans into the habitat and has created a habitat edge throughout its length.

Therefore, while both actual and effective habitat loss along the road/pipeline route and at the pad would result in reduced numbers of several species, these reductions would represent a minor part of the total project area. The total project area is but a small portion of an extensive area of the same or similar habitat along the flanks of the basaltic highlands south of the Colorado River.

The deer and elk winter range would be protected by a 5-month TL from December 1 through April 30 (Appendix D). This TL is attached as a stipulation on Federal lease COC547373. An exception to this TL was granted to EnCana in January 2008 to allow winter drilling for the winters of 2008-2009 and 2009-2010 as a way to allow EnCana to finish drilling the area more promptly.

No raptor nests were found in proximity to project components during previous surveys. However, a COA in Appendix D addresses the fact that raptors are protected under the Migratory Bird Treaty Act and that future restrictions on construction, drilling, or completion activities could be applied if a nest is constructed and occupied by raptors in proximity to the project (see Appendix D). An additional COA in Appendix D addresses protection of wildlife from exposure to potentially harmful fluids in pits on the well pad.

#### *Alternative Road and Pipeline*

Impacts resulting from implementation of this alternative would be comparable to those under the Proposed Action, described above. While the total habitat loss would be slightly greater due to a longer road and partially separate pipeline corridor, this alternative would avoid the crossing of the unnamed tributary drainage, which adds somewhat to the overall species richness and abundance of the project area.

#### *No Action Alternative*

Because the No Action alternative would not include approval of any activities on BLM lands, no impacts to terrestrial wildlife would occur.

**Analysis of Public Land Health Standard for Plant and Animal Communities (partial, see also **Vegetation and Wildlife, Aquatic**)**: A formal Land Health Assessment has not been completed for the project area watershed. Implementation of either the Proposed Action or the Alternative Road and Pipeline in conjunction with similar activity occurring in the greater watershed would probably trend the area downward somewhat as habitat is lost and fragmented and human use is increased in the area. Because no offsite or indirect impacts are anticipated if applicable COAs (see Appendix D) are implemented, neither the Proposed Action nor the Alternative Road and Pipeline is expected to adversely affect aquatic wildlife or result in a failure of the project area to achieve Standard 4 for special status species.

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

### **SUMMARY OF CUMULATIVE IMPACTS**

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

Until relatively recently, modifications of the region have been characteristic of agricultural and ranching lands, with localized industrial impacts associated with the railroad and I-70 highway corridors. More recently, these changes are cumulative to the growth of residential and commercial uses, utility corridors, oil and gas developments, and other rural industrial uses. These increasing activity levels have accelerated the accumulation of impacts in the area. These impacts have included: (1) direct habitat

losses; (2) habitat fragmentation and losses in habitat effectiveness; (3) elevated potential for runoff, erosion, and sedimentation; (4) expansion of noxious weeds and other invasive species; and (5) increased noise and traffic and reductions in the scenic quality of the area (BLM 1999: 4-1 to 4-68).

None of the cumulative impacts described in the FSEIS was characterized as significant, and new technologies and regulatory requirements have reduced the impacts of some land uses. Nonetheless, it is clear that past, present, and reasonably foreseeable future actions has had and would continue to have adverse affects on various elements of the human environment. The anticipated impact levels for existing and future actions range from negligible to locally major, and primarily negative, for specific resources. The primary reasons for this assessment are twofold:

- The rate of development, particularly oil and gas development, is increasing in the area, resulting in an accelerated accumulation of individually nominal effects; and
- Most of the residential and commercial expansion, as well as oil and gas development, have occurred, and are likely to continue to occur, on private holdings where mitigation measures designed to protect and conserve resources are not in effect.

It is clear that the Proposed Action would contribute to the collective adverse impact for some resources. Although minor, the project would contribute incrementally to impacts on air quality, vegetation, migratory birds, terrestrial wildlife, and other resources.

**PERSONS AND AGENCIES CONSULTED**

Mike McGuire, Rebecca Brock, Mike Meskin - Grass Mesa Homeowners Association Board of Directors  
 Garland Anderson - Adjacent Landowner  
 David Grisso, RuthAnn Morss, Miracle Pfister, Scott Parker, Bob Anderson – EnCana  
 Buck Hinkson, Surveyor – Wasatch Surveying  
 Dave Andrews and Kevin King – Colorado Oil and Gas Conservation Commission

**INTERDISCIPLINARY REVIEW**

<i>Name</i>	<i>Title</i>	<i>Responsibility</i>
Jim Byers	Natural Resource Specialist	Team Leader, Access and Transportation, Solid and Hazardous Wastes, Socio-Economics
Beth Brenneman	Ecologist	Invasive Non-native Species, Special Status Species (Plants), Vegetation
Allen Crockett	Supervisory Natural Resource Specialist	Special Status Species (Wildlife and Fish), Birds of Conservation Concern, Aquatic and Terrestrial Wildlife
Karen Conrath	Geologist	Groundwater, Paleontology, Geology and Minerals
Cheryl Harrison	Archaeologist	Cultural Resources, Native American Religious Concerns
Noel Ludwig	Hydrologist	Soil, Air, Surface Water, US Waters, Noise, Wetlands
Will Howell	Petroleum Engineer	Downhole COAs
Lindsey Utter	Landscape Architect-OTAK	Recreation, Visual Resources

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## **FONSI BLM-DOI-CO-N040-2009-0102 EA**

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

### **DECISION RECORD**

**DECISION:** It is my decision to approve the construction and associated maintenance of the Alternative Road and Pipeline Route from the existing C26NW Road off County Road (CR) 319 to the proposed L26NW pad as shown on Topo B in the Applications for Permit to Drill (APDs), the construction of the L26NW Pad as shown on the plats submitted in the APDs, and the drilling, completion and production operations for the five Federal wells and two fee wells as described in the APD package. A Sundry Notice shall be approved allowing the operator to occupy the L26NW pad to drill the two fee wells since the fee wells would be drilled within the Grass Mesa Federal Unit. This decision will provide for the orderly, economical, and environmentally sound exploration and development of oil and gas resources on valid oil and gas leases.

The Alternative Road and Pipeline Route is chosen as the route to access the L26NW pad based on a number of factors. The tight curve alignment and risk of a potential accident or traffic conflict at the Grass Mesa Homeowner (GMHOA) Road crossing designed into the Proposed Action presents an overriding concern for public safety even with the proposed Traffic Control Plan identified. Although the traffic control plan identifies a process to control vehicles crossing the GMHOA Road for both HOA users and EnCana traffic, it was unclear or deficient in addressing the policing of potential EnCana traffic that might use or be tempted to use the relatively short distance down the GMHOA Road to CR319 instead of traversing the long, circuitous route across the Grass Mesa road system. After review of both routes, the expected visual impact is much reduced on the Alternative Route since there is a far greater opportunity to utilize the existing pinyon-juniper forest as tree screening. Such an opportunity did not exist along the lower segments of the Proposed Action route.

EnCana's offer to stage storage tanks serving the L26NW pad at the C26NW pad near the valley floor provides a unique opportunity to reduce truck traffic to the L26NW pad for the majority of the productive life of the planned wells. In staging the tanks at the C26NW pad, the scar created with the installation of the gas and water pipelines between the L26NW pad and the C26NW pad was a factor that led to the decision to meld the Alternative Road route with the pipeline to achieve one disturbance corridor across the overall landscape. The Proposed Action effectively would create two disturbances in the landscape with the additional impact of increasing truck traffic across Grass Mesa to support the drilling and completion of the L26NW wells.

The target gas reservoir to be tapped with the proposed wells on the L26NW pad was initially proposed for development, with wells on the O27NW pad in the Grass Mesa Geographic Area Plan (approved in fall 2004). The O27NW pad was not approved in the Geographic Area Plan as there were unresolved conflicts with critical resource values and proximity of the proposed O27NW to existing residences. The L26NW pad was included as a future pad in the Grass Mesa year-round drilling program approved by BLM in 2007 (although the pad was identified as I27NW at the time of that request). The I27NW pad name changed into the L26NW pad as it was shifted during onsite field visits across the section line from Section 27 to Section 26.

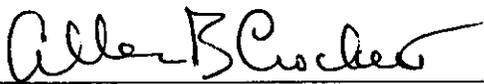
RATIONALE: The bases for this decision are as follows:

1. Approval of the Proposed Action is validating the rights granted with the Federal oil and gas leases to develop the leasehold to provide commercial commodities of oil and gas.
2. The environmental impacts have been mitigated with measures included in the attached Conditions of Approval.

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

NAME OF PREPARER: Jim Byers, Natural Resource Specialist

SIGNATURE OF AUTHORIZED OFFICIAL:



Supervisory Natural Resource Specialist

DATE SIGNED: Sept. 18, 2009

**APPENDIX A**

**EnCana Questionnaire Sent to Grass Mesa Homeowners  
October 2008**

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## GMHOA Questionnaire Road Access Options for L26NW

October 8, 2008

Following are the two roadway options presented by David Grisso at the September 20, 2008 Grass Mesa Home Owners' Association Meeting for the L26NW access road. A map to assist you in indentifying locations is *enclosed*. Please indicate your preference and include any comments you would like considered in the final determination.

**Option "A" (shown in red):**

- Crossing Grass Mesa road will be required. This crossing is on BLM surface, road starting at the H27NW pad. Approximately 800 feet of GMHOA road BLM surface will be widened and improved.

EnCana will:

- Widen stretch of the road to the corner
- Place a signal light at intersection
  - Only one EnCana or contracting truck will cross at a time
  - All trucks will abate for Grass Mesa traffic
- Install guardrail TBD
- Have electronic sign posted
- During construction, drilling, completions and reclaim (approximately 8 to 9 months from beginning of construction) of L26W EnCana will:
  - Maintain GMHOA road (top of hill to mailboxes)
  - Provide snow removal
  - Provide 24-hour traffic control at intersection

*Note: Will drill 8-9 wells and reclaim immediately*

**Option "B" (shown in blue)**

- Install guardrail on EnCana BLM road
- Install barrier for snow and rocks
- No road maintenance on GMHOA hill road

I prefer Option A                       I prefer Option B

Comments

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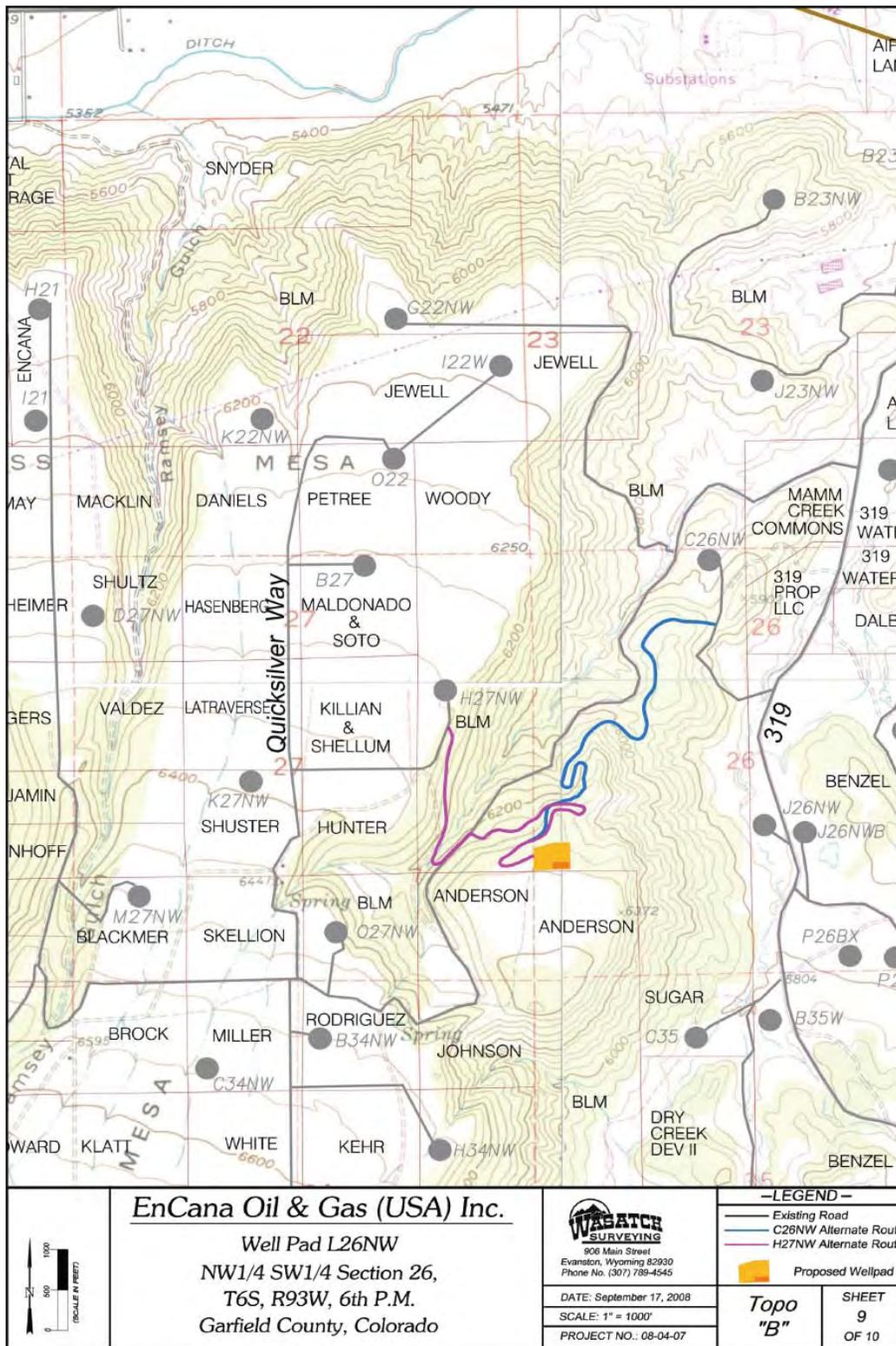
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Signed \_\_\_\_\_ Date: \_\_\_\_\_

Please print name \_\_\_\_\_

**Questionnaires must be returned in stamped, self-addressed envelope by October 20, 2008.**

**Thank you.**

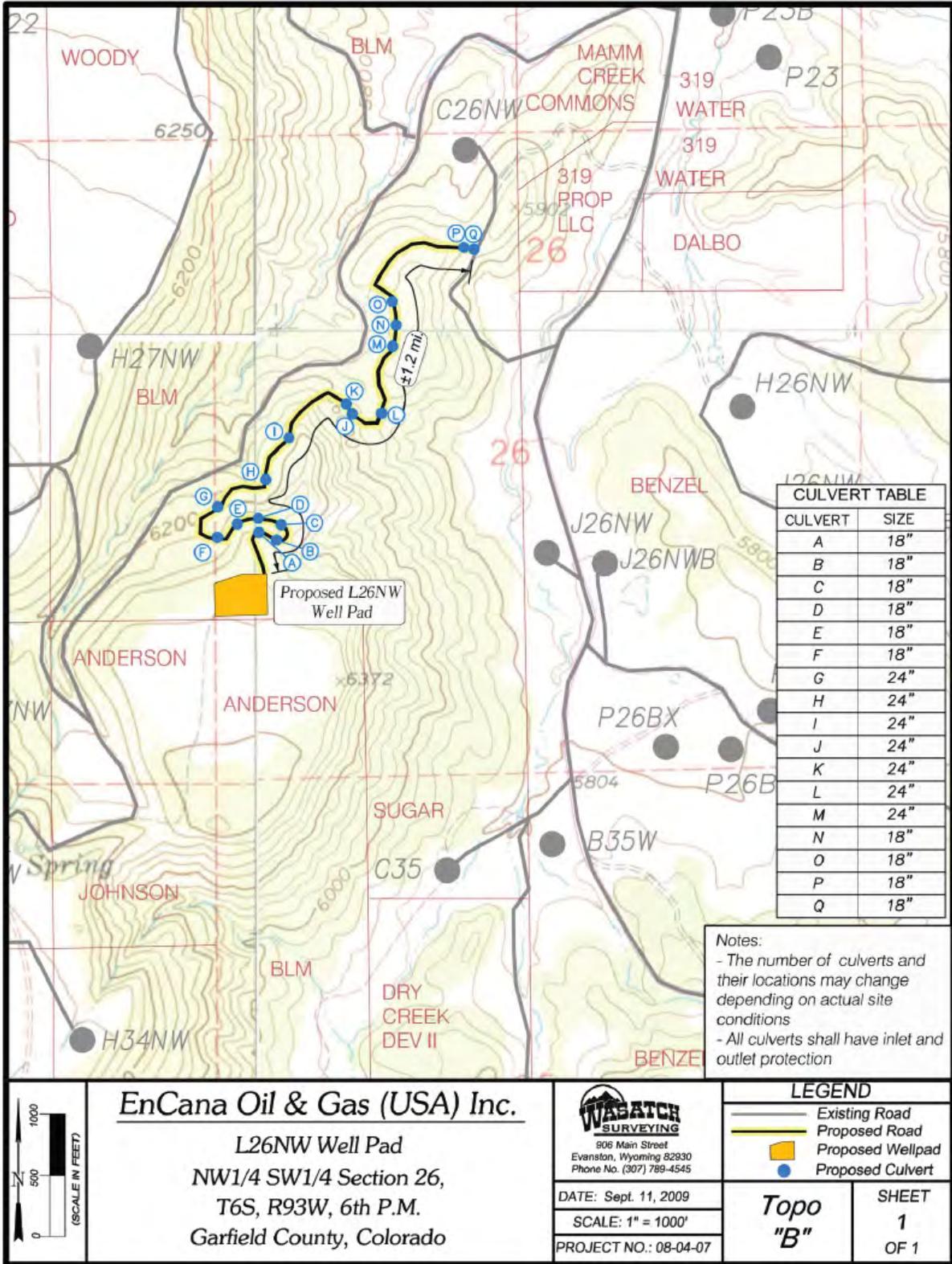


Map sent with EnCana Questionnaire, October 2008. Option A (purple route which early version of Proposed Action) and Option B (blue route which represents the C26NW route).

## **APPENDIX B**

### **Culvert Locations for Alternative Road and Pipeline Route**

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Note: Minimum Culvert Diameter is 24 inches. Culverts J and K will be installed with 36-inch pipe; Culvert L will be installed with 48" pipe. Refer to COA in Appendix D.

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**APPENDIX C**  
**TRAFFIC CONTROL PLAN**

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### **EnCana Traffic plan for the L26NW**

1. Temporary traffic light (manual operation) at the intersection of the lease road and Grass Mesa HOA. Manned 24/7 from construction start to tubing landed on last well. Daylight only during reclamation.
- 2. EnCana traffic will yield to all HOA traffic.**
3. One vehicle will be allowed to cross at any given time, recheck up and down hill clearance then proceed with next EnCana vehicle.
4. All drilling water and frac water will be pumped from the C26NW site.
5. Production tanks will be located at the C26NW site.
6. HOA road will be widened to maximum allowed by BLM up and down hill to the nearest corner to improve sight range and stopping ability. EnCana expense.
7. EnCana will maintain HOA road top to bottom during drilling and completion.
8. Only traffic to location for production life of the well will be lease operator and wellbore maintenance when needed. When maintenance is required by workover during well life span flagger will be implemented for equipment mob.

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**APPENDIX D**

**STANDARD and SITE-SPECIFIC  
SURFACE USE CONDITIONS OF APPROVAL**

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**STANDARD AND SITE-SPECIFIC  
SURFACE USE CONDITIONS OF APPROVAL (COAs)**

**SURFACE USE COAs**

The following standard surface use COAs are in addition to all stipulations attached to the respective Federal leases and to any site-specific COAs for individual well pads. Wording and numbering of these COAs may differ from those included in the EA. In cases of discrepancies, the following COAs supersede earlier versions.

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

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

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

5. Jurisdictional Waters of the U.S. The operator shall obtain appropriate permits from the U.S. Army Corps of Engineers 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 Colorado/Gunnison Basin Regulatory Office at 970-243-1199.

6. Wetlands and Riparian Zones. The operator shall restore temporarily disturbed wetlands or riparian areas. The operator shall consult with the BLM Silt Office to determine appropriate mitigation, including verification of native plant species to be used in restoration.
7. Reclamation. The goals, objectives, timelines, measures, and monitoring methods for final reclamation of oil and gas disturbances are described in Appendix I (Surface Reclamation) of the 1998 Draft Supplemental EIS (DSEIS). Specific measures to follow during interim and temporary (pre-interim) reclamation are described below.

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

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

- b. Topsoil Stripping, Storage, and Replacement. Topsoil shall be stripped following removal of vegetation during construction of well pads, pipelines, roads, or other surface facilities. This shall include, at a minimum, the upper 6 inches of soil. Any additional topsoil present at a site, such as indicated by color or texture, shall also be stripped. BLM may specify a stripping depth during the onsite visit. The stripped topsoil shall be stored separately from subsoil or other excavated material and replaced prior to final seedbed preparation.
- c. Seedbed Preparation. For cut-and-fill slopes, initial seedbed preparation shall consist of backfilling and recontouring to achieve the configuration specified in the reclamation plan. For compacted areas, initial seedbed preparation shall include ripping to a minimum depth of 18 inches, with a maximum furrow spacing of 2 feet. Where practicable, ripping shall be conducted in two passes at perpendicular directions. Following final contouring, the backfilled or ripped surfaces shall be covered evenly with topsoil.

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

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

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

- d. Seed Mixes. A seed mix consistent with BLM standards in terms of species and seeding rate for the specific habitat type shall be used on all BLM lands affected by the project (see Attachments 1 and 2 of the letter provided to operators dated May 1, 2008). Note that temporary seeding allows use of a seed mix containing sterile hybrid non-native species in addition to native perennial species.

For private surfaces, the menu-based seed mixes are recommended, but the surface landowner has ultimate authority over the seed mix to be used in reclamation. The seed shall contain no noxious, prohibited, or restricted weed seeds and shall contain no more than 0.5 percent by

weight of other weed seeds. Seed may contain up to 2.0 percent of “other crop” seed by weight, including the seed of other agronomic crops and native plants; however, a lower percentage of other crop seed is recommended. Seed tags or other official documentation shall be supplied to the BLM at least 14 days before the date of proposed seeding for acceptance. Seed that does not meet the above criteria shall not be applied to public lands.

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

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

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

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

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

- g. Erosion Control. Cut-and-fill slopes shall be protected against erosion with the use of water bars, lateral furrows, or other measures approved by BLM. Biodegradable straw matting, bales or wattles of weed-free straw or weed-free native grass hay, or well-anchored fabric silt fence shall be used on cut-and-fill slopes and along drainages to protect against soil erosion. Additional BMPs shall be employed as necessary to reduce erosion and offsite transport of sediment.
- h. Site Protection. The pad shall be fenced to BLM standards to exclude livestock grazing for the first two growing seasons or until seeded species are firmly established, whichever comes later. The seeded species will be considered firmly established when at least 50 percent of the new plants are producing seed. BLM will review and approve the type of fencing.
- i. Monitoring. The operator shall conduct annual monitoring surveys of reclaimed areas and shall submit an annual monitoring report to BLM by **December 31** of each year. The monitoring program shall use the four Reclamation Categories defined in Appendix I of the 1998 DSEIS to assess progress toward reclamation objectives. The annual report shall document whether attainment of reclamation objectives appears likely. If one or more objectives appear unlikely to be achieved, the report shall identify appropriate corrective actions. Upon review and approval of the report by the BLM, the operator shall be responsible for implementing the corrective actions or other measures specified by BLM.

8. Weed Control. The operator shall regularly monitor and promptly control noxious weeds or other undesirable plant species as set forth in the Glenwood Springs Energy Office *Noxious and Invasive Weed Management Plan for Oil and Gas Operators*, dated May 2008. A Pesticide Use Proposal (PUP) must be approved by the BLM prior to the use of herbicides. Annual weed monitoring reports shall be submitted by **December 31**.
9. Big Game Winter Range. The Federal lease to be developed from the L26NW pad contains a Big Game Winter Range Timing Limitation (TL) that prohibits construction, drilling, and completion activities during the period December 1 through April 30 of each year. In January 2008, BLM granted an exception to that TL as a way to allow EnCana to complete its planned drilling in the Grass Mesa area on a more compressed schedule. That exception applies to the 2008-2009 and 2009-2010 winter seasons. Therefore, EnCana would be allowed to undertake the proposed project during the 2009-2010 winter, but work would have to be completed no later than November 30, 2010.
10. Raptor Nesting. 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.

Raptor nest surveys conducted in 2005 for the well pad and associated pipeline did not result in location of raptor nest structures within 0.25 mile of the well pad or 0.125 mile of the road or pipeline. Therefore, a Raptor Nesting Timing Limitation (TL) is not attached to this project if the work is conducted prior to the 2010 raptor nesting season, which is defined as February 1 to August 15. This caveat is based on a maximum 5-year duration of raptor nesting survey results. If the work is not conducted prior to February 1, 2010, the operator shall conduct a new raptor nesting survey and shall be subject to a 60-day TL to prohibit construction, drilling, or completion activities within the buffer widths specified above. The specific 60-day timeframe will be selected based on the species believed to have constructed the nest. An exception will be granted if the nest is not occupied during the nesting season in which construction, drilling, or completion activities are anticipated. The TL will not apply to construction, drilling, or completion activities that are initiated before February 1 of any year and continue without interruption (of longer than one week) into the nesting season.

11. Migratory Birds. It shall be the responsibility of the operator to comply with the Migratory Bird Treaty Act with respect to “take” of migratory bird species. Under the Act, “take” means to pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct.

The operator shall prevent use by migratory birds of any pit containing fluids associated with oil or gas operations—including but not limited to reserve pits, produced water pits, frac-water pits, cuttings trenches (if covered by water/fluid), and evaporation pits. Fluids in these pits may pose a risk to migratory birds (e.g., waterfowl, shorebirds, wading birds, songbirds, and raptors) as a result of ingestion, absorption through the skin, or interference with buoyancy and temperature regulation. Regardless of the method used, it should be employed as soon as practicable after the pit has begun receiving liquids. At a minimum, the method shall be in place within 24 hours following the placement of fluids into a pit. Because of high toxicity to birds, oil slicks and oil sheens should immediately be skimmed off the surface of any pit that is not netted. The most effective way to eliminate risk to migratory birds is prompt drainage, closure, and reclamation of pits, which is strongly encouraged. All mortality or injury to species protected by the MBTA shall be reported immediately to the BLM project lead and to the U.S. Fish and Wildlife Service. For further assistance, contact the USFWS Biologist assigned to the BLM Silt Office at 970-876-9000 or [creed\\_clayton@fws.gov](mailto:creed_clayton@fws.gov), and visit <http://www.fws.gov/mountain-prairie/contaminants/oilpits.htm>.

12. Birds of Conservation Concern: Pursuant to BLM Instruction Memorandum 2008-050, all surface-disturbing activities are prohibited from May 1 to June 30 to reduce impacts to Birds of Conservation Concern (BCC). An exception to this COA will be granted if nesting surveys conducted no more than one week prior to surface-disturbing activities indicate that no BCC species are nesting or otherwise present within 10 meters of the area to be disturbed. Nesting surveys shall include an audial survey for diagnostic vocalizations in conjunction with a visual survey for adults and nests. Surveys shall be conducted by a qualified breeding bird surveyor between sunrise and 10:00 AM under favorable conditions for detecting and identifying a BCC species.
13. Range Management. Range improvements (fences, gates, reservoirs, pipelines, etc) shall be avoided during development of natural gas resources to the maximum extent possible. If range improvements are damaged during exploration and development, the operator will be responsible for repairing or replacing the damaged range improvements. If a new or improved access road bisects an existing livestock fence, steel frame gate(s) or a cattleguard with associated bypass gate shall be installed across the roadway to control grazing livestock.
14. Ips Beetle. To avoid mortality of pinyon pines due to infestations of the *Ips* beetle, any pinyon trees damaged during road, pad, or pipeline construction shall be chipped after being severed from the stump or grubbed from the ground, buried in the toe of fill slopes (if feasible), or cut and removed from the site within 24 hours to a location approved by the Colorado State Forest Service.
15. Paleontological Resources. All persons associated with operations under this authorization shall be informed that any objects or sites of paleontological or scientific value, such as vertebrate or scientifically important invertebrate fossils, shall not be damaged, destroyed, removed, moved, or disturbed. If in connection with operations under this authorization any of the above resources are encountered the operator shall immediately suspend all activities in the immediate vicinity of the discovery that might further disturb such materials and notify the BLM authorized officer of the findings. The discovery must be protected until notified to proceed by the BLM authorized officer.

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

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

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

If in connection with operations under this contract, the operator, its contractors, their subcontractors, or the employees of any of them discovers, encounters, or becomes aware of any objects or sites of cultural value or scientific interest such as historic ruins or prehistoric ruins, graves or grave markers, fossils, or artifacts, the operator shall immediately suspend all operations in the vicinity of the cultural resource and shall notify the BLM authorized officer of the findings (16 USC 470h-3, 36 CFR 800.112). Operations may resume at the discovery site upon receipt of written instructions and

authorization by the BLM authorized officer. Approval to proceed will be based upon evaluation of the resource. Evaluation shall be by a qualified professional selected by the BLM authorized officer from a Federal agency insofar as practicable. When not practicable, the operator shall bear the cost of the services of a non-Federal professional.

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

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

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

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

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

Monitor: A cultural resource monitor will be required during all phases of construction for the road and/or pipeline in the northern half of Section 26 by an archaeology firm qualified to do such archaeological work within the Glenwood Springs Resource Area.

- No ground-disturbing construction activities shall begin prior to the archaeologist's arrival. The proponent is responsible for notifying the archaeologist at least 72 hours in advance of any proposed ground disturbance.
- If cultural resources are discovered, all ground disturbing activities in the vicinity of identified find(s) shall be halted and a buffer area at least 100 ft on each side of the find(s) will be protected from any additional disturbance until which time as the find(s) is mitigated.
- Mitigation of the discovery may require a data recovery plan and consultation with the State Historic Preservation Officer.
- A stratigraphic profile shall be drawn and photographs. As appropriate, samples for analysis and/or paleoenvironmental reconstruction shall be taken as appropriate.

- Periodic reporting to the BLM archaeologist of progress and findings shall be completed on a weekly or more frequent schedule as deemed necessary by the BLM authorized officer.
  - A draft report documenting the monitor shall be completed in accordance with GSFO monitor report standards and presented to the GSFO archaeologist for review within 30 days of completion of the monitor followed by a final report within 30 days after the review is received. A time extension may be requested by the archaeological firm from the GSFO archaeologist if additional time is required to finalize the data and report.
17. **Visual Resources.** Production facilities shall be placed to avoid or minimize visibility from travel corridors, residential areas, and other sensitive observation points—unless directed otherwise by BLM due to other resource concerns—and shall be placed to maximize reshaping of cut-and-fill slopes and interim reclamation of the pad.
- To the extent practicable, existing vegetation shall be preserved when clearing and grading for pads, roads, and pipelines. The authorized officer may direct that cleared trees and rocks be salvaged and redistributed over reshaped cut-and-fill slopes or along linear features.
- Above-ground facilities shall be painted Shadow Grey to blend with the existing landscape.
18. **Reserve Pit.** A minimum of 2 feet of freeboard shall be maintained in the reserve pit. Freeboard is measured from the highest level of drilling fluids and cuttings in the reserve pit to the lowest surface elevation of ground at the reserve pit perimeter.
19. **Soils.** Cuts and fills shall be minimized when working on erosive soils and slopes in excess of 30 percent. Cut-and-fill slopes shall be stabilized through revegetation practices with an approved seed mix shortly following construction activities to minimize the potential for slope failures and excessive erosion. Fill slopes adjacent to drainages shall be protected with well-anchored silt fences, straw wattles, or other acceptable BMPs designed to minimize the potential for sediment transport. On slopes greater than 50 percent, BLM personnel may request a professional geotechnical analysis prior to construction.
20. **Road Construction.** Where sideslopes exceed 50%, no sidecasting from road construction will be allowed; excavated material shall be end-hauled to a location with gentler slopes – preferably where additional fill material will be needed. Where feasible in areas with sideslopes less than 50%, cuts shall be laid back to 2:1 slope in order to break up the visual scar and facilitate reclamation.

### **Site-Specific COAs for Proposed Action and Alternative Road and Pipeline**

1. To help reduce hydrocarbon odors affecting nearby residence(s), no frac pit construction or use will be allowed. Only standard reserve pits of a size to support the number of planned wells will be allowed within 0.5 mile of residence (B16W, E9W, G22NW H27NW H34NW, K4D, K22NW, K33NW and O27NW aka L26NW).
2. To help mitigate noise impacts from drilling to nearby residence, a drill rig with state-of-the-art noise reduction enhancements shall be used on location to drill wells. Sound barriers will be installed along south and western side of the pad to provide visual and noise screening for nearby residence during the drilling and completion process. Lighting on the drill rig shall be configured to avoid direct illumination toward the nearby residence.

3. To minimize truck traffic to the L26NW pad, remote completion (frac) operations using the C26NW pad is strongly encouraged utilizing the buried water lines planned for the pipeline corridor.
4. To mitigate noise and visual impacts arising from well production operations, a mound feature shall be created during interim reclamation and pad reshaping. The raised earth feature shall be generally located in the southwest pad quadrant in a manner that maximizes screening of equipment and operation on the pad. Prior to pad reshaping, BLM and EnCana representatives shall visit the site to determine the optimal location, shape and configuration of the feature. Typical topsoil spreading shall include the mound feature to promote establishment of desirable vegetation. Furthermore, the height of the reclaimed mound shall not be so high as to obscure the tree tops along edge of mesa east and north of the pad.
5. Prior to pad construction, the existing dilapidated wire fence along the north side of the propped pad shall be removed and disposed.
6. The existing horse trail that winds its way generally from L26Nw pad to the C26NW pad will be intersected in a number of spots by the proposed L26NW access road and pipeline. Where the trail is intersected, a path for continued use of the trail by recreation users shall be provided by removing any tree slash or rocks that may create an impediment.
7. EnCana has agreed to locate the storage tanks supporting the L26NW wells on the C26NW pad. The tanks shall be installed on the C26NW pad as shown on Sheet 1 of 1 dated 9/2/09. The separators shall be staged on the L26NW pad. Prior to installation of the separator units, a site visit by EnCana and BLM representatives shall determine the final location of the separators on the pad.
8. The pipelines (one steel gas line and two flexsteel water lines) shall generally be installed within the road disturbance corridor typically along the planned road ditch. The pipelines shall be installed in the same trench preferably before road construction is completed.
9. To dissuade any motorized use of the C26NW road or the L26NW road by the traveling public, EnCana can install a traffic control gate on BLM land near the intersection with CR 319.
10. All construction, drilling, completion and production operations on the L26NW pad shall occur on BLM land and not on the adjacent private land. To ensure compliance, EnCana is urged to establish the private land boundary via survey.

### **Site-Specific COAs for Alternative Road and Pipeline**

1. Nearly the entire Alternative Road and Pipeline shall be constructed with a requirement that cleared trees be windrowed along the downslope side to create a windrow barrier to catch rolling debris, rocks, and other materials that could be generated during the road construction operations. If the construction techniques are unable to control rolling hazard, a person with radio communications with the equipment operators would be staged along the GMHOA Road to delay construction work when vehicles are passing along the GMHOA Road. During construction of the road and pipeline, should any construction debris or rockfall be inadvertently deposited on the GMHOA Road, the operator shall immediately mobilize the necessary equipment and remove the traffic hazards from the roadway so that normal traffic flow on GMHOA Road is re-established.
2. As identified in EnCana's construction plans for the Alternative Route, the road shall be surfaced with 5 inches of 3-inch minus material and 3 inches of 1½-inch road base. Geofabric material shall

be placed across the width of the roadway on north-facing slopes, or wet, shaded areas. The fabric shall be installed underneath the 5-inch layer of road subgrade. To accommodate the sections where no sidecasting is allowed and fill material must be hauled, hammerhead turnarounds for haul trucks shall be identified in the field during the road pioneering.

3. The L26NW road shall be constructed along the centerline stakes placed in field. For the upper 1500 feet of road construction (Stations 32+00 through 47+00), the road design package prepared by River City Consultants (dated 12/16/08) shall be referenced and used.

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**APPENDIX E**

**DOWNHOLE CONDITIONS OF APPROVAL**

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**DOWNHOLE CONDITIONS OF APPROVAL**  
**Applications for Permit to Drill**

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

**Surface Location:** NWSW, Section 26, Township 6 South, Range 93 West, 6<sup>th</sup> P.M.

<u>Well Name</u>	<u>Well No.</u>	<u>Bottomhole Location</u>	<u>Lease</u>
Federal(L26NW)	27-9A	NESE Sec. 26, T. 7S, R. 95W.	COC54737
Federal(L26NW)	27-9C	NESE Sec. 26, T. 7S, R. 95W.	COC54737
Federal(L26NW)	27-9D1	NESE Sec. 26, T. 7S, R. 95W.	COC54737
Federal(L26NW)	27-9D2	NESE Sec. 26, T. 7S, R. 95W.	COC54737
Federal(L26NW)	26-12A2	SWNW Sec. 26, T. 7S, R. 95W.	COC54737

1. Twenty-four hours *prior* to (a) spudding, (b) conducting BOPE tests, (c) running casing strings, and (d) within twenty-four hours *after* spudding, the GSEO shall be notified. One of the following GSEO's inspectors shall be notified by phone: Steve Ficklin at 970-947-5213, Julie King shall at 970-947-5239, and Todd Sieber at 970-947-5220.
2. A GSEO petroleum engineer shall be contacted for a verbal approval prior to commencing remedial work, plugging operations on newly drilled boreholes, changes within the drilling plan, changes or variances to the BOPE, deviating from conditions of approval, and conducting other operations not specified within the APD. Contact, Will Howell at 970-947-5221 (office) or 970-319-5837 for verbal approvals. As a secondary contact, call Dane Geyer at 970-947-5229 (office) or 970-589-6887 (cell) for verbal approvals.
3. If a well control issue arises (e.g. kick, blowout, or water flow), casing failure occurs, or an increase in bradenhead pressure occurs during fracturing operations, Will Howell shall be notified within 24 hours from the time of the event.
4. The BOPE shall be tested and conform to Onshore Order #2 for a **5M** system.
5. A casinghead rated to 5,000 psi or greater shall be utilized.
6. An electrical/mechanical mud monitoring equipment shall be functional prior to drilling out the next shoe. At a minimum, this shall include a trip tank, pit volume totalizer, stroke counter, and flow sensor.
7. Gas detecting equipment shall be installed in the mud return system, prior to drilling out the next shoe, and hydrocarbon gas shall be monitored for pore pressure changes.
8. A gas buster shall be functional and all flare lines effectively anchored in place, prior to drilling out the next shoe. The discharge of the flare lines shall be a minimum of 100 feet from the well head and targeted at bends. The panic line shall be a separate line (not open inside the buffer tank) and effectively anchored. All lines shall be downwind of the prevailing wind direction and directed into a flare pit, which cannot be the reserve pit. The flare system shall use an automatic ignition. Where noncombustible gas is likely or expected to be vented, the system shall be provided supplemental fuel for ignition and maintain a continuous flare.

9. Surface Casing cement will be circulated to surface. If the TOC is lower than required or the cement sheath of poor quality, then, a CBL will be run and remedial cementing performed to insure zone isolation/wellbore integrity. Contact Will Howell 970-947-5221 or 970-319-5837.
10. Prior to commencing fracturing operations, the production casing shall be tested to the maximum anticipated surface fracture pressure and held for 15 minutes. If leak-off is found, Will Howell shall be notified within 24 hours of the failed test, but prior to proceeding with fracturing operations. The test shall be charted and set to a time increment as to take up no less than a quarter of the chart per test. The chart shall be submitted with the well completion report.
11. On the first well drilled on this pad, a triple combo (open hole logs) shall be run from the base of the surface borehole to surface, and another run from TD to the surface casing shoe. Each open-hole log shall be submitted to the GSEO within 24 hours after running. These logs shall be submitted digitally in LAS. format. If EnCana can find the open hole log from well (Federal #30-11), it will be accepted in lieu of running an open hole on subsequent wells planned for this pad. Contact Karen Conrath at 970-947-5235 or karen\_conrath@blm.gov for clarification.
12. As a minimum, cement shall be brought to 200 feet above the Mesaverde. Prior to commencing fracturing operations, a CBL shall be run (from TD to 200 feet above the TOC) and an electronic copy submitted to the GSEO. If the TOC is lower than required or the cement sheath of poor quality, then, within 48 hours from running the CBL and prior to commencing fracturing operations, a GSEO petroleum engineer shall be notified for further instruction.
13. Submit the (a) mud/drilling log (e.g. Pason disc), (b) driller's event log/operations summary report, (c) production test volumes, (d) directional survey, and (e) Formation Integrity Test results with the well completion report. Contact Will Howell for clarification.
14. After the surface casing is cemented, a leak-off test will be performed on the first well drilled in accordance with OOGO No. 2; Sec. III, B.1. i. in order to make sure the surface casing is set in a competent formation. Submit the results from the test via email (william\_howell@blm.gov) on the first well drilled on the pad.
15. EnCana Oil & Gas, Inc. shall test all domestic water wells within a 0.25- mile radius of a Federal well bore prior to spudding the gas well (baseline test of water well) and within 3 days after the last completion operation for the pad or 30 days from the most recent completion stage if there is an extended break in the completion process (whichever occurs sooner). Water samples shall be tested by a qualified third-party entity for hydrocarbons and other compounds utilized in the drilling or completion operations. Results of water sampling shall be reported to the appropriate domestic well owner within 30 days of testing. If contamination is found in the post-completion water sample when compared to the baseline sample, BLM and landowner shall be notified within 24 hours from the time the data is analyzed.

**APPENDIX F**

**VISUAL CONTRAST RATING WORKSHEETS**

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UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT  
**VISUAL CONTRAST RATING WORKSHEET**

Date: 03.10.09

District/ Field Office: Glenwood Springs

Resource Area: GSFO

Activity (program): Proposed Action for L26NW  
Access Rd, Pad and Pipeline and Alternative Rd  
Alignment

**SECTION A. PROJECT INFORMATION**

1. Project Name: EnCana L26NW  2. Key Observation Point: KOP 1  3. VRM Class: Class III	4. Location: Township 6S  Range 93W  Section 26	5. Location Sketch 
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**SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION**

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Rolling hillsides with benches, leading down to the flat valley floor and up to mountains in the distance	Amorphous, organic, complex, non-directional	Horizontal, vertical, geometric, thin
LINE	Horizontal, diagonal for valleys and ridge lines	Complex, mainly formed from changes in color or absence of vegetation	Horizontal, geometric
COLOR	Light tans, browns, grays, burnt reds	Olive green, dark green, golden browns, tans, straw-colored	Whites, grays, browns, metallic
TEXTURE	Fine to medium	Fine to medium, patchy	Fine

**SECTION C. PROPOSED ACTIVITY DESCRIPTION**

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	No apparent change	Existing vegetation will be interrupted by removed vegetation in linear shapes	N/A
LINE	Horizontal, diagonal	Removal of vegetation will result in straight lines along the edge of disturbance	N/A
COLOR	Light tans	Light green	Shadow Gray
TEXTURE	Fine	Fine	Fine

SECTION D. CONTRAST RATING     SHORT TERM     LONG TERM

1. DEGREE OF CONTRAST		FEATURES												2. Does project design meet visual resource management objectives? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No (Explain on reverses side)	
		LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)					
		STRONG	Moderate	Weak	None	STRONG	Moderate	Weak	None	STRONG	Moderate	Weak	None		
ELEMENTS	FORM				X		X							X	3. Additional mitigating measures recommended <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No    (Explain on reverses side)  Evaluator's Name: Date Lindsey Utter 03.10.09
	LINE			X			X							X	
	COLOR		X					X						X	
	TEXTURE			X				X						X	

Comments from item 2.

The project is located in a VRM Class III area. Land located under the VRM Class III designation can have moderate change but should still partially maintain the existing character of the landscape. Changes to the landscape in Class III areas should still repeat basic elements found in the natural features of the landscape. Management activities may attract attention but should not dominate the view of the casual observer.

Even though the removal of vegetation and the disturbance of ground would create moderate contrast in color, line, and form this would meet the requirements of Class III.

Additional Mitigating Measures (See item 3)

The planning process for this project involved many site visits where layout and locations for the pad, pipeline, and access road were reviewed. Designing the project to utilize existing terrain as a screen to viewer locations was employed as much as possible. To help alleviate the color and line contrast created by cut slopes and the removal of vegetation along the road route, woody material removed during construction will be stockpiled and then laid back on exposed slopes post construction. All associated facilities will be painted Shadow Gray.

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT  
**VISUAL CONTRAST RATING WORKSHEET**

Date: 09.09.09

District/ Field Office: Glenwood Springs

Resource Area: GSFO

Activity (program): L26NW Proposed Action  
(Pad, Access Road and Pipeline Route)

## SECTION A. PROJECT INFORMATION

1. Project Name: EnCana L26NW	4. Location Township 6S	5. Location Sketch 
2. Key Observation Point: KOP 2A	Range 93W	
3. VRM Class: Class III	Section 26	

## SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Enclosed valley landscape with steep hillside rising from a narrow drainage	Amorphous, dense stands of P/J	Horizontal, geometric roads and occasional home
LINE	Vertical, diagonal	Complex, mainly formed from changes in color or absence of vegetation	Horizontal, geometric
COLOR	Light tans, browns, grays	Olive green, dark green, grays, dark brown	Brown
TEXTURE	Fine to medium	Fine to medium, patchy	Fine

## SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Narrow, long road; cut-and-fill slopes	Absence interrupts the dense P/J stand	N/A
LINE	Bold diagonal	Bold, long, linear edge of removed vegetation following the cut slopes	N/A
COLOR	Light tans, browns	Light greens and grays	N/A
TEXTURE	Smooth to medium	Smooth	N/A

SECTION D. CONTRAST RATING      SHORT TERM      LONG TERM

1.		FEATURES												2. Does project design meet visual resource management objectives? <u>  </u> Yes    X No (Explain on reverses side)
		LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)				
DEGREE OF CONTRAST		STRONG	MODERATE	WEAK	NONE	STRONG	MODERATE	WEAK	NONE	STRONG	MODERATE	WEAK	NONE	3. Additional mitigating measures recommended X Yes <u>  </u> No    (Explain on reverses side)
ELEMENTS	FORM			X		X							X	
	LINE		X			X							X	
	COLOR				X		X						X	
	TEXTURE				X		X						X	

Comments from item 2.

The project is located in a VRM Class III area. Land located under the VRM Class III designation can have moderate change but should still partially maintain the existing character of the landscape. Changes to the landscape in Class III areas should still repeat basic elements found in the natural features of the landscape. Management activities may attract attention but should not dominate the view of the casual observer.

The removal of vegetation to accommodate cut slopes, especially along the access road as it is cut up the hillside to the north of the GMHOA road, would create a geometric void in the existing stands interrupting the form, line, and color. This would result in the Proposed Action being very apparent to the casual observer from KOP 2A.

Impacts to the south of the GMHOA road, including the pipeline route, would be less apparent and not dominate the view because they would be intermittently visible above the traveler.

Additional Mitigating Measures (See item 3)

Care must be taken during construction to preserve vegetation on and below fill slopes, as the upright woody material will provide screening. The upper edge of cut slopes should undulate and take advantage of opportunities where the existing topography and openings in vegetation provide locations which more gradual contours can be created during reclamation. Woody material cleared during construction should be placed back on cut slopes in naturally appearing way to break up the texture and color of the exposed slopes and to create microclimates encouraging vegetation reestablishment.

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT  
**VISUAL CONTRAST RATING WORKSHEET**

Date: 09.09.09

District/ Field Office: Glenwood Springs

Resource Area: GSFO

Activity (program): L26NW Alternative Road Alignment

## SECTION A. PROJECT INFORMATION

1. Project Name: EnCana L26NW	4. Location Township 6S	5. Location Sketch 
2. Key Observation Point: KOP 2B	Range 93W	
3. VRM Class: Class III	Section 26	

## SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Enclosed valley landscape with steep hillside rising from a narrow drainage	Amorphous, dense stands of P/J	Horizontal, geometric roads and occasional homes
LINE	Vertical, diagonal	Complex, mainly formed from changes in color or absence of vegetation	Horizontal, geometric
COLOR	Light tans, browns, grays	Olive green, dark green, grays, dark brown	Brown
TEXTURE	Fine to medium	Fine to medium, patchy	Fine

## SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Narrow, linear road cut-and-fill slopes	Absence interrupts the dense P/J stand	N/A
LINE	Gradual diagonal, horizontal	Linear edge of upper cut slope when passing through P/J	N/A
COLOR	Light tans, browns	Light greens and grays	N/A
TEXTURE	Smooth to medium	Smooth	N/A

SECTION D. CONTRAST RATING       SHORT TERM       LONG TERM

1.  DEGREE OF CONTRAST		FEATURES												2. Does project design meet visual resource management objectives? <u>  </u> Yes <input checked="" type="checkbox"/> No (Explain on reverses side)
		LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)				
		STRONG	MODERATE	WEAK	NONE	STRONG	MODERATE	WEAK	NONE	STRONG	MODERATE	WEAK	NONE	
ELEMENTS	FORM		X				X						X	3. Additional mitigating measures recommended X Yes <u>  </u> No    (Explain on reverses side)
	LINE		X				X						X	
	COLOR			X				X					X	
	TEXTURE	X							X				X	
														Evaluator's Name: Lindsey Utter Date 09.09.09

Comments from item 2.

The project is located in a VRM Class III area. Land located under the VRM Class III designation can have moderate change but should still partially maintain the existing character of the landscape. Changes to the landscape in Class III areas should still repeat basic elements found in the natural features of the landscape. Management activities may attract attention but should not dominate the view of the casual observer.

Portions of fill slopes will occasionally be quite close to the GMHOA road with no existing vegetation to provide screening. Although exposed earth slopes do occur in the landscape, the proximity of the smooth fill slopes to the viewer will be visually apparent and dominate in sections where the viewer is looking directly at the fill slopes. The removal of vegetation to accommodate cut slopes as the Alternative Access road passes through P/J stands would create a bold line of removed vegetation in the existing stands interrupting the form, line, and color. This would result in the Proposed Action being very apparent to the casual observer from KOP 2B.

The pipeline would lay in the road most of the way and the sections where it deviates would not be visible.

Additional Mitigating Measures (See item 3)

Care must be taken during construction to preserve vegetation on and below fill slopes, as the upright woody material will provide screening. The upper edge of cut slopes should undulate and take advantage of opportunities where the existing topography and openings in vegetation provide locations where more gradual contours can be created during reclamation. Woody material cleared during construction should be placed back on cut slopes in naturally appearing way to break up the texture and color of the exposed slopes and to create microclimates encouraging vegetation reestablishment.

Fill slopes in direct view from the GMHOA shall have rock and other material placed on them to emulate other exposed slopes in the area.