

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

ENVIRONMENTAL ASSESSMENT

NUMBER: DOI-BLM-CO-N040-2010-0078-EA

CASEFILE NUMBER: Federal Oil and Gas Lease COC60433; Communitization Agreements COC73836 and COC70806.

PROJECT NAME: Proposal to Drill Eight Federal Wells from the Existing 35L Pad and Five Federal Wells from the Existing 36L Pad on Private Land Near Battlement Creek Southeast of Parachute, Garfield County, Colorado.

PAD LOCATIONS:

Pad 35L – Township 7 South (T7S), Range 95 West (R95W), Section 35, NW¹/₄SW¹/₄ , 6th P.M.

Pad 36L – T7S, R95W, Section 36, NW¹/₄SW¹/₄, 6th P.M.

LEGAL DESCRIPTIONS: Surface and bottomhole locations of proposed Federal are listed in Table 1.

Table 1. Surface and Bottomhole Locations of Proposed Wells		
<i>Proposed Wells</i>	<i>Surface Locations (Section 35, T7S, R95W)</i>	<i>Bottomhole Locations (Section 21, T6S, R95W)</i>
35-14C (35L)	NW ¹ / ₄ SW ¹ / ₄ , 2115 feet FSL 543 feet FWL	SW ¹ / ₄ SW ¹ / ₄ , 577 feet FSL 626 feet FWL
35-14D (35L)	NW ¹ / ₄ SW ¹ / ₄ , 2109 feet FSL 539 feet FWL	SW ¹ / ₄ SW ¹ / ₄ , 253 feet FSL 624 feet FWL
35-14A (35L)	NW ¹ / ₄ SW ¹ / ₄ , 2128 feet FSL 552 feet FWL	SW ¹ / ₄ SW ¹ / ₄ , 1191 feet FSL 620 feet FWL
35-14B (35L)	NW ¹ / ₄ SW ¹ / ₄ , 2122 feet FSL 547 feet FWL	SW ¹ / ₄ SW ¹ / ₄ , 889 feet FSL 613 feet FWL
35-24D (35L)	NW ¹ / ₄ SW ¹ / ₄ , 2110 feet FSL 551 feet FWL	SE ¹ / ₄ SW ¹ / ₄ , 238 feet FSL 1953 feet FWL
35-24C (35L)	SE ¹ / ₄ NW ¹ / ₄ , 2511 feet FNL 1443 feet FWL	SW ¹ / ₄ NW ¹ / ₄ , 2161 FNL 1676 feet FWL
35-24B (35L)	NW ¹ / ₄ SW ¹ / ₄ , 2122 feet FSL 559 feet FWL	SE ¹ / ₄ SW ¹ / ₄ , 2125 feet FSL 1939 feet FWL
35-24A (35L)	NW ¹ / ₄ SW ¹ / ₄ , 2128 feet FSL 564 feet FWL	SE ¹ / ₄ SW ¹ / ₄ , 1172 feet FSL 1942 feet FWL
<i>Proposed Wells</i>	<i>Surface Locations (Section 36, T7S, R95W)</i>	<i>Bottomhole Locations (Section 36, T7S, R95W)</i>
36-14A (36L)	NW ¹ / ₄ SW ¹ / ₄ , 2036 feet FSL 697 feet FWL	SW ¹ / ₄ SW ¹ / ₄ , 1168 feet FSL 668 feet FWL
36-24B (36L)	NW ¹ / ₄ SW ¹ / ₄ , 2033 feet FSL 715 feet FWL	SE ¹ / ₄ SW ¹ / ₄ , 809 feet FSL 2046 feet FWL
36-24C (36L)	NW ¹ / ₄ SW ¹ / ₄ , 2030 feet FSL 708 feet FWL	SE ¹ / ₄ SW ¹ / ₄ , 497 feet FSL 2045 feet FWL
36-24D (36L)	NW ¹ / ₄ SW ¹ / ₄ , 2027 feet FSL 701 feet FWL	SE ¹ / ₄ SW ¹ / ₄ , 220 feet FSL 2050 feet FWL
36-24A (36L)	NW ¹ / ₄ SW ¹ / ₄ , 2035 feet FSL 7522 feet FWL	SE ¹ / ₄ SW ¹ / ₄ , 1085 feet FSL 2040 feet FWL

APPLICANT: Noble Energy, Inc. Contact: Judi Kohn, Regulatory Manager, 1625 Broadway, Suite 220, Denver, Colorado 80202.

PROPOSED ACTION

Noble Energy, Inc. (“Noble”) proposes to drill and develop 13 Federal oil and gas wells from two locations. The 35L pad was previously built by Presco (former owner) several years ago and reclaimed by Noble approximately 8 months ago. No wells were drilled on the 35L location. The 36L pad is an existing pad currently supporting three producing fee wells drilled in 2008. Both pads are located on private land owned by Noble near Battlement Creek, about 6 miles southeast of Parachute, Garfield County, Colorado. Eight Federal wells are proposed on the 35L pad, and five Federal wells are proposed on the 36L pad. The Federal wells would be drilled directionally from these two locations into underlying Federal lease COC60433. Lease terms applicable to the wells are presented in the Lease Stipulations section. Both pads are accessed through public and private lands; however, public access would not be available because the existing access road into the development area on Battlement Mesa is across private land. The 35L pad is situated on a west-facing slope, and the 36L pad is on a north-facing slope. Both pads are accessed on existing roads. Both pads lie within a mixed woodland of conifers and quaking aspen with associated shrubs and grasses in the understory. The 36L pad is currently in production and has not undergone interim reclamation.

35L Pad and 36 L Pad Plans

Figures 2 and 3 show the pad layouts for the 35L and 36L pads. A 12-inch gas-gathering pipeline is in place along the existing access roads leading to both pads. A new 8-inch diameter steel gas-gathering trunkline and a 4-inch flex steel produced water pipeline would be buried 4 feet deep within the access road and tie into the main 12-inch diameter natural gas pipeline in the main road at the 35C pad. From that point, they would extend road another 0.5 mile northeast to the 35L pad along the access road. Water for drilling operations would be obtained from the near Rifle by Hyland Enterprises, Inc, the hauling company permitted for this activity and contracted by Noble. Noble plans to utilize a Closed Loop Drilling System, and no cuttings pits are anticipated. On both pads, cuttings from the wells, once dry, would be stacked in a corner of the pad against the cutslope. At that point, the cuttings would be tested to Colorado Oil and Gas Conservation Commission (COGCC) specifications and then re-laced onto the pad during reclamation and covered with fill material and topsoil (Figures 4 and 5). Produced water during completions operations would be placed into holding tanks on location and then transferred into the water pipelines and disposed of through their injection well process on private lands.

A small tank farm would be located just off the 35L pad, on the uphill side of the access road. A small area would be notched out for the tanks, approximately 0.17 acre in size. Separators would be located off the pad as well, near the road entrance to the pad between the tanks. The 35L pad is anticipated to have 11 tanks and 6 separators on location. The 35L pad falls under a Federal Communitization Agreement, which requires that bottomholes in Sections 35 and 36 be segregated for appropriate Federal allocation and metering/calibration. Consequently, more than one tank may be required on the 35L tank farm.

The planned short-term surface disturbance for the 35L pad totals 4.3 acres and includes the off-pad locations of the tanks and separators. No new surface disturbance is expected from installing the pipeline along the existing road. After interim reclamation, the pad area would be 1.3 acres, all on private land.

The same gas-gathering pipeline in place along the existing roads to the 35L pad also continues to the 36L pad. Currently, three fee wells drilled in 2008 are producing on the well pad, and no new pipelines would be needed for the five proposed Federal wells. Total surface disturbance on this pad is 5.3 acres. After interim reclamation, 3 acres of surface disturbance would remain. The condensate tanks are currently located along the access road to the pad and are expected to remain off the pad. Separators are located on the pad and would be expected to remain on location.

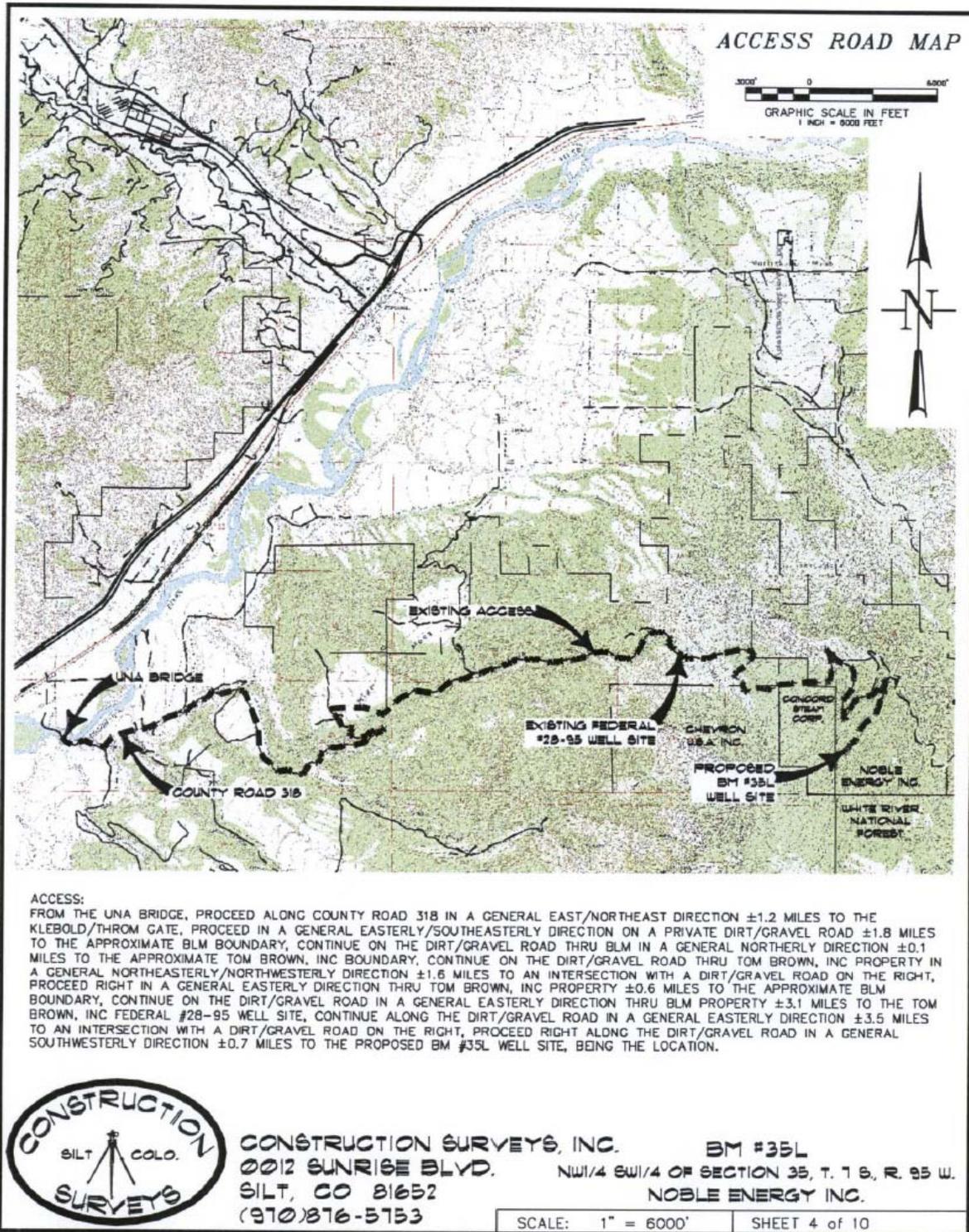


Figure 1. Access Roads to 35L and 36L Pads.

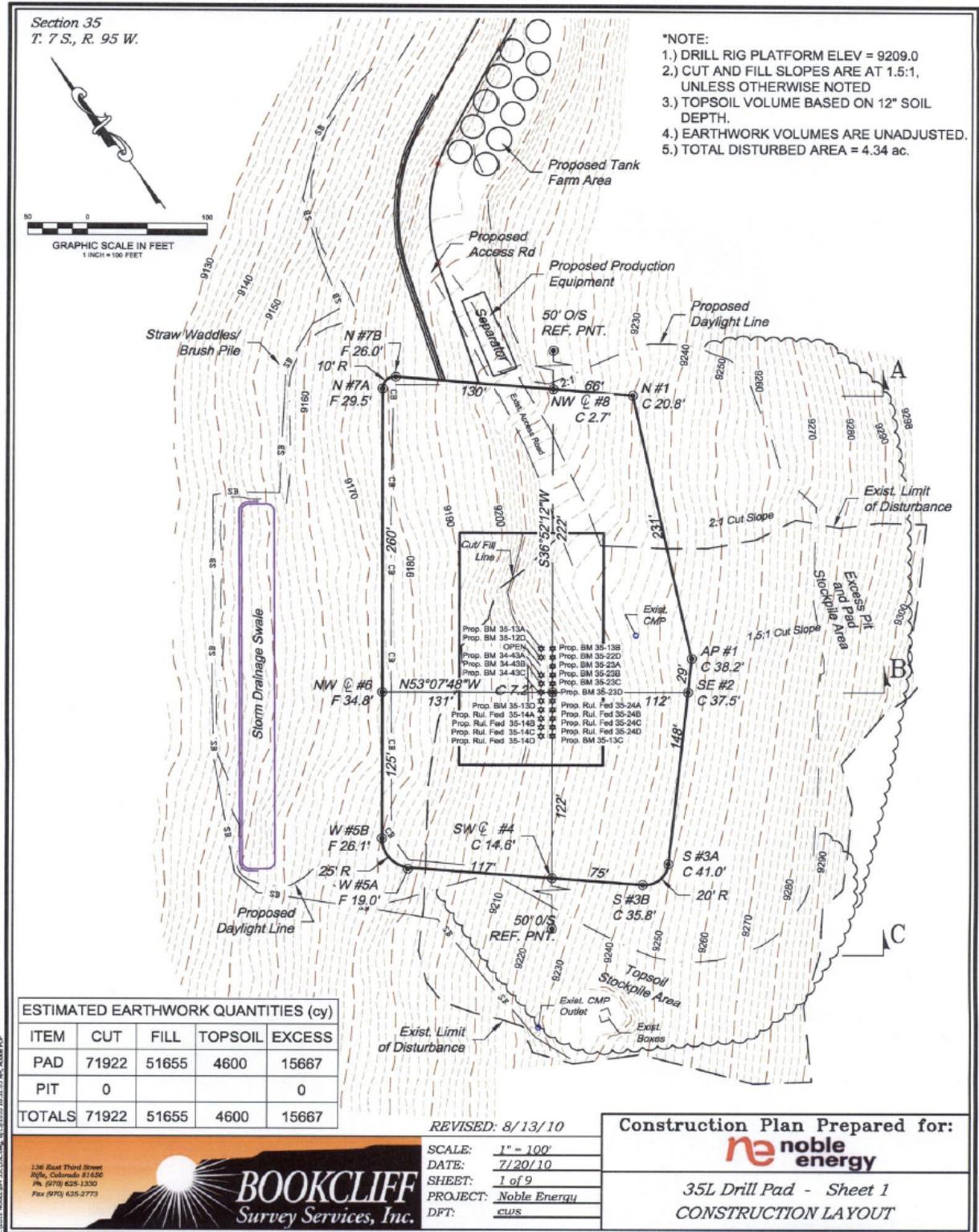


Figure 2. 35L Pad Construction Layout.

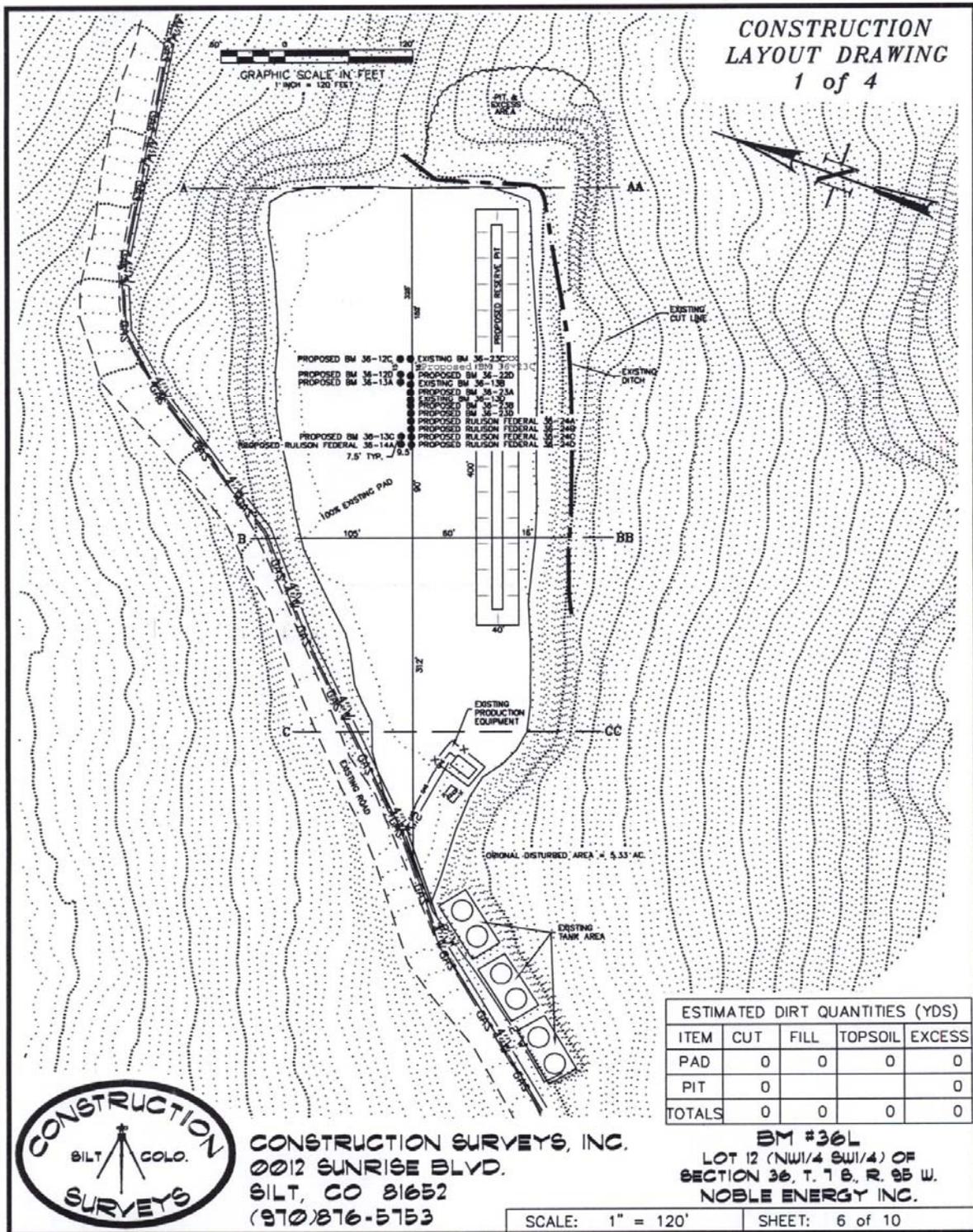


Figure 3. 36L Pad Existing Layout.

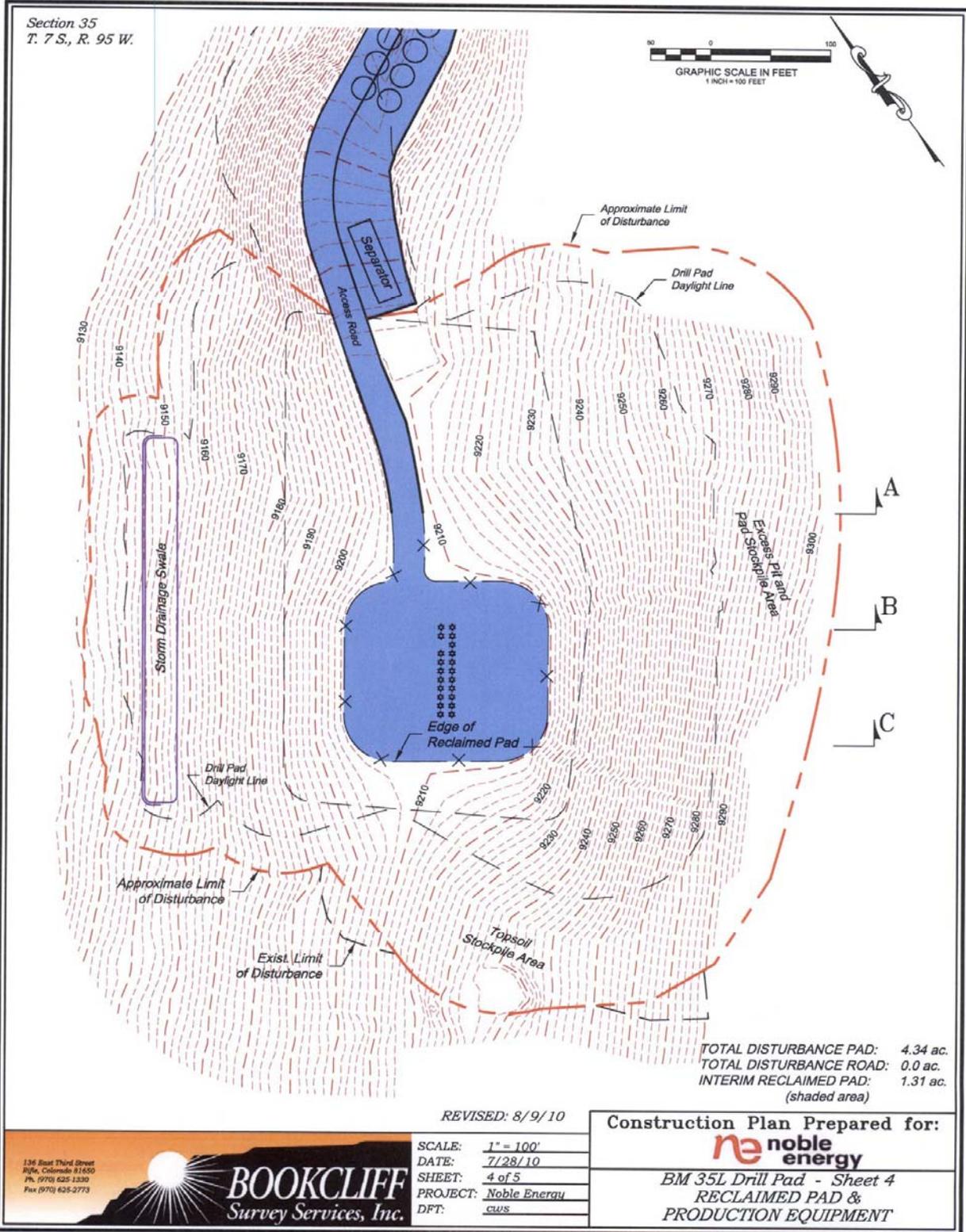


Figure 4. 35L Pad Reclamation Layout.

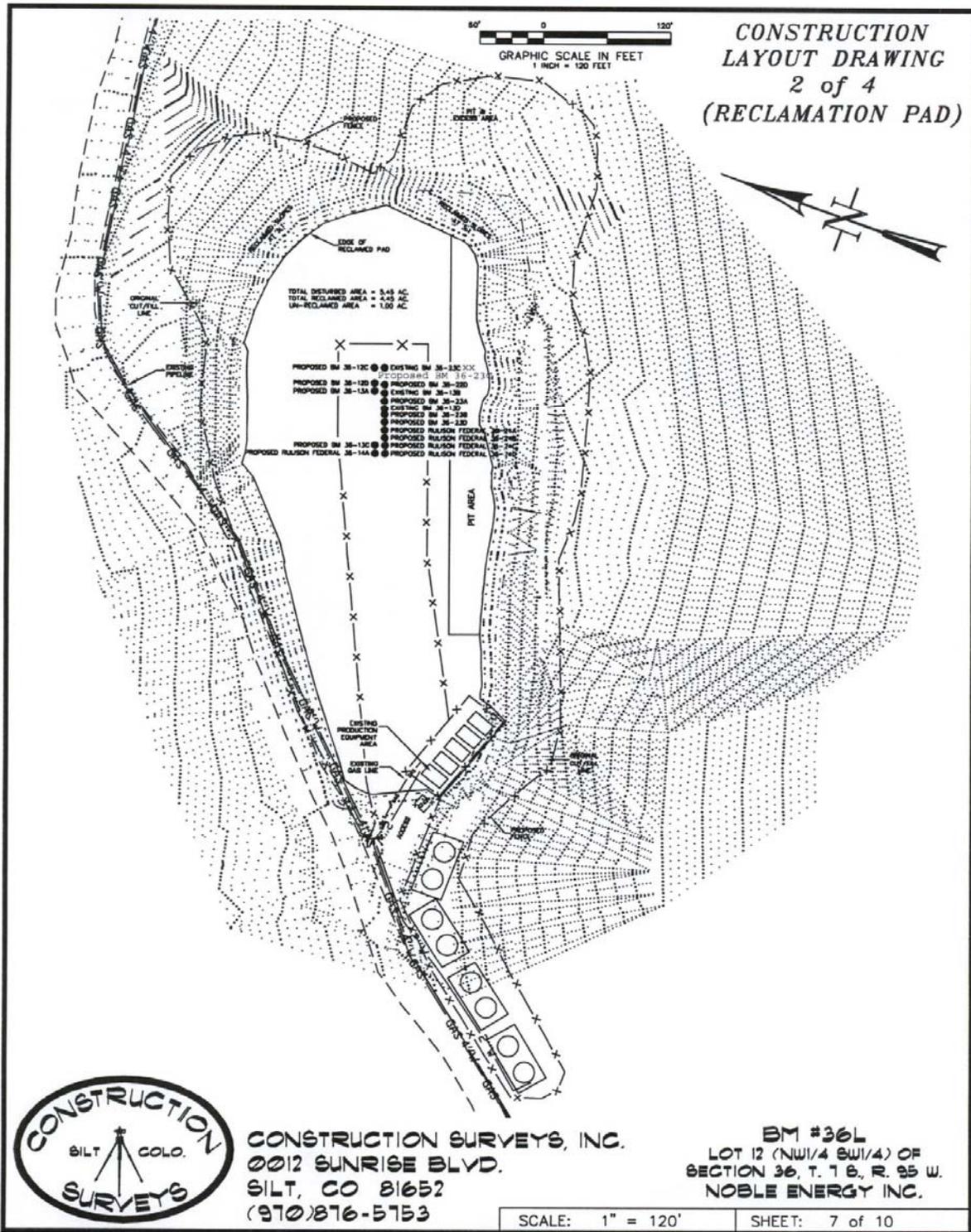


Figure 5. 36L Pad Reclamation Layout.

Pad and pipeline construction would follow the guidelines established in the BLM Gold Book, *Surface Operating Standards for Oil and Gas Exploration and Development* (USDI and USDA 2007). A road maintenance program would be required during the production phase of the wells. This program would include blading, ditching, culvert installation and cleanout, weed control, and gravel surfacing and resurfacing when needed. Roads would be maintained in a safe and usable condition.

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

NO ACTION ALTERNATIVE

The No Action Alternative constitutes denial of the 13 Federal APDs associated with the Proposed Action. However, production-related activities associated with the existing Fee wells would continue, as would upgrades to the roads, pipelines, and other surface disturbance for the existing Fee wells and any additional Fee wells drilled under the authority of the COGCC.

PURPOSE AND NEED FOR THE ACTION

The purpose of the action is to develop oil and gas resources on Federal lease COC60433 consistent with existing Federal lease rights. The action is needed to increase the development of oil and gas resources for commercial marketing to the public.

SUMMARY OF LEASE STIPULATIONS

The 13 Federal wells would be directionally drilled from the two Fee surface locations into underlying Federal lease COC60433. The applicable Federal lease terms are presented in Table 2. Appendix A presents standard and site-specific COAs applicable to Federal APDs.

Table 2. Lease Stipulations Applicable to the Proposed Action		
<i>Lease</i>	<i>Where Applied</i>	<i>Lease Stipulation</i>
COC60433	T7S, R95W Sec. 25: SESW; Sec. 35: S2S2;	Controlled Surface Use. Fragile Soils and Slopes Great than 35%. Maintain soil productivity of site. Prevent accelerated erosion and protect water quality (surface and groundwater sources).
COC60433	T7S, R95W Sec. 25: SESW;	Controlled Surface Use. Protect perennial water impoundments and streams, and/or riparian/wetland vegetation by moving oil and gas exploration and development beyond the riparian vegetation zone. <i>Exception Criteria:</i> An exception may be granted if an onsite impact analysis shows no degradation to resource values.

PLAN CONFORMANCE REVIEW

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

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

Dates Amended: November 1991 – Oil and Gas Plan Amendment (BLM 1991); March 1999 – Oil & Gas Leasing & Development Record of Decision and Resource Management Plan Amendment (BLM 1999b).

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

Environmental analysis of proposed projects on BLM land must address whether the Proposed Action or alternatives being analyzed would result in impacts that would maintain, improve, or deteriorate land health conditions identified in the applicable Land Health Assessment (LHA). However, because no component of the Proposed Action would involve BLM surface lands, an LHA does not apply, and conformance with the land health standards is not evaluated in this EA.

AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

During its internal scoping process for this Environmental Assessment (EA), pursuant to the National Environmental Policy Act (NEPA), BLM resource specialists identified the following elements of the natural and human environment as present in the project vicinity and potentially affected by the project:

Access and Transportation	Paleontological Resources
Air Quality	Socio-Economics
Cultural Resources	Soils
Geology and Minerals	Vegetation
Invasive Non-Native Plants	Wastes, Hazardous and Solid
Migratory Birds	Water Quality, Surface and Ground
Noise	Wildlife, Aquatic and Terrestrial

This section describes those environmental elements and analyzes the direct and indirect impacts on those elements potentially resulting from implementation the Proposed Action. Environmental

Access and Transportation

Affected Environment

The project area is accessed by exiting I-70 at the town of Parachute (Exit 75), driving west through Parachute on U.S. Highway 6 (First Street), turning south (left) onto Una Road (County Road [CR] 300) for 2.4 miles, turning right onto “High Mesa Road” (not labeled), and staying to the right in a southeasterly direction for 6 miles. At this point, the route turns right at the sign for another pad, the 35C,

and continues through that pad for 0.5 mile to the 35L location. Access to the 36L pad follows the same route except that it bears left at the sign to the 35C pad and continues 2 miles to the 36L location. Figure 1 shows the access routes.

Environmental Consequences

Proposed Action

The Proposed Action would result in a substantial temporary increase in truck traffic and a less substantial long-term increase compared to existing traffic associated with the three existing Fee wells on the 36L pad. An estimated 1,160 truck trips over a 30-day period would be required to support the drilling and completion of a proposed Federal well (Table 3). Once the well is in production, traffic would decrease to occasional visits for monitoring or maintenance activities. The well is assumed to require recompletion once per year. Each recompletion would require 3 to 5 truck-trips per day for approximately 7 days. Fluids (condensate and produced water) generated during the life of the well would be stored in tanks onsite and periodically removed from the tanks and trucked offsite.

Table 3. Traffic Associated with Drilling and Completion Activities		
<i>Vehicle Class</i>	<i>Number of Trips per Well</i>	<i>Percentage of Total</i>
16-wheel tractor trailers	88	7.6%
10-wheel trucks	216	18.6%
6-wheel trucks	452	39.0%
Pickup trucks	404	34.8%
Total	1,160	100.0%

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

Degradation of field development roads from travel by heavy vehicles is expected to require periodic road maintenance. Both road maintenance activities and vehicular travel would create fugitive dust and noise (see sections on air quality and noise). Mitigation measures to be applied as COAs (Appendix A) would ensure adequate dust abatement and road maintenance occur.

No Action Alternative

This alternative would not affect access or transportation other than as associated with long-term production and maintenance of the three existing Fee wells on the 36L pad and with any Fee wells drilled under the authority of the COGCC.

Air Quality

Affected Environment

Colorado Ambient Air Quality Standards (CAAQS) and National Ambient Air Quality Standards (NAAQS) are health-based criteria for the maximum acceptable concentrations of air pollutants in areas of public use. Although specific air quality monitoring has not been conducted within the project area, regional air quality monitoring has been conducted in Rifle and elsewhere in Garfield County (Air Resources 2009). Air pollutants measured in the region for which ambient air quality standards exist include carbon monoxide (CO), nitrogen dioxide (NO₂), ozone (O₃), particulate matter less than 10 microns (µ) in diameter (PM₁₀) and less than 2.5 µ in diameter (PM_{2.5}), and sulfur dioxide (SO₂).

The project area lies within Garfield County, which has been described as an attainment area under CAAQS and NAAQS. An attainment area is an area where ambient air pollution quantities are below (i.e., better than) NAAQS standards. As shown in Table 4, regional background values are well below established standards, and all areas within the cumulative study area are designated as attainment for all criteria pollutants. Federal air quality regulations are enforced by the Colorado Department of Public Health and Environment (CDPHE). The Prevention of Significant Deterioration (PSD) Program within CDPHE is designed to limit incremental increases for specific air pollutant concentrations above a legally defined baseline level, as defined by an area's air quality classification. Incremental increases in PSD Class I areas are strictly limited.

Air pollutants measured in the region for which ambient air quality standards exist include carbon monoxide (CO), nitrogen dioxide (NO₂), ozone (O₃), particulate matter less than 10 microns (μ) in diameter (PM₁₀) and less than 2.5 μ in diameter (PM_{2.5}), and sulfur dioxide (SO₂). 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 NCSMDP area and surrounding areas are classified as PSD Class II. The PSD Class I areas located within 100 miles of the NCSMDP area are Flat Tops Wilderness (approximately 25 miles north), Maroon Bells – Snowmass Wilderness (approximately 35 miles south), West Elk Wilderness (approximately 60 miles southeast), Black Canyon of the Gunnison National Monument (approximately 65 miles south), and Eagles Nest Wilderness (approximately 60 miles east). Dinosaur National Monument (approximately 80 miles northwest) is listed as a Federal Class II area but is regulated as a Class I area for SO₂ by CDPHE. Regional background pollutant concentrations and applicable standards or limits are listed in Table 4.

Table 4. Air Pollutant Background Concentrations, Colorado and National Ambient Air Quality Standards, and Prevention of Significant Deterioration Increments.					
<i>Pollutant/Averaging Time</i>		<i>Measured Background</i>	<i>CAAQS and/or NAAQS</i>	<i>Incremental Increase Above Legal Baseline</i>	
Carbon Monoxide (CO) ¹	1-hour	1,160 $\mu\text{g}/\text{m}^3$	40,000 $\mu\text{g}/\text{m}^3$ (35 ppm)	n/a	n/a
	8-hour	1,160 $\mu\text{g}/\text{m}^3$	10,000 $\mu\text{g}/\text{m}^3$ (9 ppm)	n/a	n/a
Nitrogen Dioxide (NO ₂) ²	Annual Arithmetic Mean	10 $\mu\text{g}/\text{m}^3$	100 $\mu\text{g}/\text{m}^3$ (0.053 ppm)	2.5 $\mu\text{g}/\text{m}^3$	25 $\mu\text{g}/\text{m}^3$
Ozone ³	8-hour	0.076 ppm (highest)	0.075 ppm	n/a	n/a
Particulate Matter (PM ₁₀) ¹	24-hour	114 $\mu\text{g}/\text{m}^3$ (highest)	150 $\mu\text{g}/\text{m}^3$	8 $\mu\text{g}/\text{m}^3$	30 $\mu\text{g}/\text{m}^3$
Particulate Matter (PM _{2.5}) ⁴	24-hour	40 $\mu\text{g}/\text{m}^3$ (highest)	35 $\mu\text{g}/\text{m}^3$	n/a	n/a
	Annual	11.2 $\mu\text{g}/\text{m}^3$	15 $\mu\text{g}/\text{m}^3$	n/a	n/a
Sulfur Dioxide (SO ₂) ^{5,6}	3-hour	24 $\mu\text{g}/\text{m}^3$	1,300 $\mu\text{g}/\text{m}^3$ (0.5 ppm)	25 $\mu\text{g}/\text{m}^3$	512 $\mu\text{g}/\text{m}^3$
	24-hour	13 $\mu\text{g}/\text{m}^3$	365 $\mu\text{g}/\text{m}^3$ (0.14 ppm)	5 $\mu\text{g}/\text{m}^3$	91 $\mu\text{g}/\text{m}^3$
	Annual	5 $\mu\text{g}/\text{m}^3$	80 $\mu\text{g}/\text{m}^3$ (0.03 ppm)	2 $\mu\text{g}/\text{m}^3$	20 $\mu\text{g}/\text{m}^3$

¹ Background data collected in Rifle, 2008; highest levels recorded in April (Air Resource Specialists 2009).
² Background data collected by EnCana at site north of Parachute, 2007 (CDPHE 2008a).
³ Background data collected in Rifle, 2008; highest levels recorded in July (Air Resource Specialists 2009).
⁴ Background data collected in Rifle, September – December 2008; highest levels recorded in December (Air Resource Specialists 2009).
⁵ Background data collected at Unocal site, 1983-1984 (CDPHE 2008a).
⁶ Colorado 3-hour AAQS = 700 $\mu\text{g}/\text{m}^3$.

Environmental Consequences

Proposed Action

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

Air quality would decrease temporarily during construction of the 35L pad, wells, and pipelines. The 36L is an existing pad; therefore, no new pipelines are needed. Pollutants generated during these activities would include combustion emissions and fugitive dust associated with construction equipment and vehicles. Construction activities for the well pad, access road, and pipelines would occur between the hours of 7:00 a.m. and 6:00 p.m. each day for a period of 4 to 6 weeks. Once construction activities are complete, air quality impacts associated with these activities would also cease. Fugitive dust from mobilization and rigging up the drill rig would also occur, although impacts associated would be minor and short-lived.

Emissions of volatile organic compounds (VOCs) are dependent on the characteristics of the condensate, tank operations, and production. The air impacts associated with the condensate tanks are anticipated to be minor, but VOC emissions would be controlled under CDPHE Regulation 7 (CDPH 2008b). This includes capture and thermal destruction of VOCs from condensate tanks.

The Roan Plateau RMPA and EIS describes potential effects from oil and gas development (BLM 2006a:4-26 to 4-37). Analyses were completed with regard to greenhouse gas emissions, a near-field and far-field analysis for "criteria pollutants" (particulate matter [PM₁₀ and PM_{2.5}], carbon monoxide, sulfur dioxide, and nitrogen oxides), and hazardous air pollutants (HAPs)(benzene, ethylbenzene, formaldehyde, hydrogen sulfide, toluene, and xylenes. Sulfur and nitrogen deposition, acid neutralizing capacity, and a visibility screening analysis were also completed for the Roan Plateau RMPA and EIS. Because the visibility screening analysis showed potential impacts at one or more Class I areas, a refined visibility analysis was also completed. The refined visibility analysis indicated a "just noticeable" impact on visibility for one day each at two Class I areas (Black Canyon of the Gunnison National Park and the Mt. Zirkel Wilderness). For the other pollutants analyzed, the implementation of oil and gas development under the Roan Plateau RMPA and EIS was calculated as having no or negligible long-term adverse impacts on air quality. The Proposed Action is within the scale of development, including the number of oil and gas wells to be drilled within the CRVFO area during the life of the Roan Plateau RMPA. Therefore, potential impacts on air quality from the Proposed Action were analyzed and disclosed as part of the air quality modeling for that project.

Activities described in the Proposed Action would result in localized short-term increases in pollutant emissions from vehicles and drilling equipment and fugitive dust emissions from construction and use of the well pads and access road. Concentrations would be expected to be below applicable ambient air quality standards as analyzed in the Roan Plateau RMPA and EIS. However, it is anticipated that construction, drilling, and production activities could produce high levels of fugitive dust in dry conditions without dust abatement. To mitigate dust generated by these activities, the operator would be required to implement dust abatement strategies as needed by watering the access road and construction areas and/or by applying a surfactant approved by the BLM (Appendix A). Additionally, the operator

would be required to apply gravel to the access road to a compacted depth of 6 inches, further reducing fugitive dust emissions (Appendix A).

Since the current land use plan was approved (BLM 1999b), ongoing scientific research has identified the potential impacts of “greenhouse gases” (GHGs) and their effects on global atmospheric conditions. These GHGs include carbon dioxide, methane, nitrous oxide, water vapor, and several trace gases. Through complex interactions on a global scale, these GHG emissions are believed by many experts to cause a net warming effect of the atmosphere, primarily by decreasing the amount of heat energy radiated by the Earth back into space.

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

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

No Action Alternative

Under the No Action Alternative, the proposed development of Federal wells described in the Proposed Action would not occur. Therefore, the types of emissions of pollutants from pad construction, vehicle and equipment engines, or disturbed surfaces that would accompany the Proposed Action would not occur, except in relation to the drilling, completion, and production of Fee wells under COGCC authority.

Cultural Resources

Affected Environment

One Class III cultural resource investigation (intensive pedestrian inventories) identified as CRVFO# 1110-17 has been conducted in the area of the proposed new well pad. Numerous other surveys have been conducted along or across the access road and pipeline route. No “historic properties” were identified within the pad area. “Historic properties” are cultural resources that are eligible or potentially eligible for inclusion on the National Register of Historic Properties (NRHP).

Environmental Consequences

Proposed Action

Implementation of the Proposed Action would have no impact to “historic properties,” because none was discovered during cultural inventory. Therefore, BLM made a determination of “**No Historic Properties**

Affected.” This determination was made in accordance with the 2001 revised regulations [36CFR 800.4(d)(1)] for Section 106 of the National Historic Preservation Act (16U.S.C 470f), the BLM/State Historic Preservation Officer (SHPO) Programmatic Agreement (1997) and Colorado Protocol (1998)]. Therefore, no formal consultation was initiated with the SHPO.

Indirect, long-term cumulative impacts from increased access and the presence of project personnel could result in a range of impacts to known and undiscovered cultural resources in the vicinity of the location. These impacts could range from illegal collection and excavation to vandalism. A standard Education/Discovery Condition of Approval (COA) for cultural resource protection would be attached to the APD(s) for the Federal wells (Appendix A). The importance of this COA would be stressed to the operator and its contractors, including informing them of their responsibilities to protect and report any cultural resources encountered during construction, drilling, completion, and maintenance operations.

No Action Alternative

The No Action Alternative constitutes denial of the APDs and denial of the BLM right-of-way associated with the Proposed Action. Under the No Action Alternative, none of the proposed developments described in the Proposed Action would take place except in conjunction with drilling, completion, and production activities related to the Fee wells under COGCC authority.

Geology and Minerals

Affected Environment

The project area is located with the southern Piceance Basin. The Piceance Basin is a broad, asymmetrical structural basin at the eastern edge of the Colorado Plateau. The basin trends southeast to northwest and contains over 200,000 feet of Cambrian through Tertiary strata. It is flanked by the White River uplift to the northeast and the Gunnison and Uncompahgre uplifts to the south and is separated from the Uinta Basin to the west by the Douglas Creek Arch.

Mineral resources within the basin include oils and gas deposits, coal, sand, and gravel. Oil and gas production is derived from tight sandstones in the Cretaceous Mesaverde Group and the Tertiary Wasatch Formation. Oil and gas are currently being produced from thousands of existing wells in nearby fields. There are several known hydrocarbon-producing marine sands located at the base of the Mesaverde Group, including the Cameo coal zone. Sand and gravel deposits are found in limited amounts in Quaternary alluvium along stream valleys.

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- or over-pressured formations are incorporated into drilling scenarios for the proposed wells. Estimates of the depths at which 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. Measures for the protection of geologic resources are detailed in the down-hole conditions of approval.

Additional effects could include an increased potential for landslides and fault movement. Small, active slumps and earthflows have been observed within the claystones of the Wasatch Formation and younger rocks near Battlement Mesa. New slumps may occur as a result of road and well pad construction on steep slopes in the Wasatch Formation. Use of drilling under pressure and hydraulic fracturing of the wells could potentially induce movement in nearby faults, causing an earthquake. However, Colorado is considered a region of minor earthquake activity with a peak acceleration of 20% and a 2% probability of exceedance in 50 years (USGS 2007).

No Action Alternative

Under the No Action Alternative, no new impacts to geologic and mineral resources would occur in relation to Federal minerals. Impacts associated with development of Fee minerals would be within the jurisdiction of the COGCC.

Invasive Non-Native Species

Affected Environment

The project occurs within a mixed woodland dominated by quaking aspen (*Populus tremuloides*) interspersed with small stands of subalpine fir (*Abies bifolia*) and Engelmann spruce (*Picea engelmannii*). Two invasive non-native biennial forbs—plumeless thistle (*Carduus acanthoides*) and houndstongue (*Cynoglossum officinale*)—were scattered across the landscape.

Environmental Consequences

Proposed Action

Surface-disturbing activities provide a niche for the invasion and establishment of invasive non-native plants (weeds), particularly when these species are already present in the surrounding area. Because invasive non-native species were found in the vicinity of the project area, the potential for invasion following construction activities is high. Mitigation measures designed to minimize the spread of these species would be attached to the Federal well APDs as COAs (Appendix A).

No Action Alternative

Impacts from invasive non-native species under the No Action Alternative would be similar to those under the Proposed Action because the acres of disturbance would be the same to accommodate development and production of Fee wells (Appendix A).

Migratory Birds

Affected Environment

The Migratory Bird Treaty Act (MBTA) provides protections for native passerines (flycatchers and songbirds) as well as birds of prey, migratory waterbirds (waterfowl, wading birds, and shorebirds), and other native species such as doves, hummingbirds, swifts, and woodpeckers. 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.

BLM's management for migratory birds focuses on species listed by the U.S. Fish and Wildlife Service (USFWS) as Birds of Conservation Concern (BCC), other neotropical migrants, and birds of prey. The current BCC list (USFWS 2008a) for Region 16 (Southern Rockies/Colorado Plateau) includes 13 species known to occur in the CRVFO area and potentially present in or near the project vicinity: the peregrine falcon (*Falco peregrinus*), prairie falcon (*F. mexicanus*), bald eagle (*Haliaeetus leucocephalus*), golden eagle (*Aquila chrysaetos*), 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*), Brewer's sparrow (*Spizella breweri*), and Cassin's finch (*Carpodacus cassinii*).

The project occurs in mixed aspen woodlands interspersed with stands of spruce-fir forest. This habitat supports a variety of subalpine species, including Neotropical migrants such as the broad-tailed hummingbird (*Selasphorus platycercus*), olive-sided flycatcher (*Contopus cooperi*), Hammond's flycatcher (*Empidonax hammondi*), plumbeous vireo (*Vireo plumbeus*), ruby-crowned kinglet (*Regulus calendula*), hermit thrush (*Catharus guttatus*), western tanager (*Piranga ludoviciana*), yellow-rumped warbler (*Dendroica coronata*), chipping sparrow (*Spizella passerina*), dark-eyed junco (*Junco hyemalis*), and pine siskin (*Carduelis pinus*), in addition to Cassin's finch. Birds of prey in the higher elevations habitats, besides the flammulated owl mentioned above, include the northern goshawk (*Accipiter gentilis*) and northern saw-whet owl (*Aegolius acadicus*).

Stands and clumps of aspen within the coniferous forest attract additional Neotropical migrants such as the cordilleran flycatcher (*Empidonax difficilis*), western wood-pewee (*Contopus sordidulus*), tree swallow (*Tachycineta bicolor*), violet-green swallow (*Tachycineta thalassina*), house wren (*Troglodytes aedon*), warbling vireo (*Vireo gilvus*), and orange-crowned warbler (*Vermivora celata*).

Raptor species known to occur in similar habitats in this portion of the CRVFO area include the Cooper's hawk (*Accipiter cooperii*), sharp-shinned hawk (*Accipiter striatus*), red-tailed hawk (*Buteo jamaicensis*), great horned owl (*Bubo virginianus*), northern pygmy owl (*Glaucidium gnoma*), flammulated owl, and northern saw-whet owl (*Aegolius acadicus*).

Environmental Consequences

Proposed Action

Under the Proposed Action, approximately 0.25 acre of new disturbance would occur on private land. The existing disturbance of 9.6 acres of private land would be reduced to 4.3 acres following interim reclamation. Drilling of the well would displace birds from preferred habitats for a short time due to noise and human presence. Displaced individuals are less likely to nest due to other suitable habitat

already being occupied and may be subject to reduced survival if the areas into which they are displaced are less suitable. Research indicates that noise associated with development and production activities can also lead to lower avian diversity and density in both adjacent and distant areas (Forman 2000, Forman and Deblinger 2000). Noise can decrease usable habitat for birds by reducing the distance at which courtship or territorial vocalizations by males are heard by potential mates, interfering with territory establishment and defense, mate selection, and reproductive potential. These impacts may result in a short-term decrease in the local populations of some species, due to both direct habitat loss resulting from vegetation removal and indirect habitat loss resulting from disturbance. However, none of the BCC species or other migratory bird species present in the area would be expected to suffer significant declines in population size or reductions in the overall viability of the species.

No raptor survey has been completed for the area. However, if construction, drilling, or completion activities begin before the start of the raptor nesting season (February 1 to August 15) as expected, no survey would be required. If construction, drilling, and completion are initiated after February 1, BLM would apply a 60-day timing limitation (TL) during the period May 1 to June 30 (Appendix A), which includes the peak of the nesting season for the Cooper's and sharp-shinned hawks and flammulated owl. BLM would grant an exception to this TL if a survey conducted during the nesting season documented no active nests.

Noble remains subject to the MBTA, administered by the USFWS, which precludes the "take" of any raptor or most other native species. The MBTA prohibits the "take" of a protected species. Under the Act, the term "take" means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. The USFWS interprets "harm" and "kill" to include loss of eggs or nestlings due to abandonment or reduced attentiveness by one or both adults as a result of disturbance by human activity, as well as physical destruction of an occupied nest.

No Action Alternative

Under the No Action Alternative, no additional construction or development activities would take place except in conjunction with Federal wells. However, any new Fee wells drilled under the authority of the COGCC would result in the same types of impacts as described for the Proposed Action, as would any impacts associated with ongoing production of existing Fee wells.

Native American Religious Concerns

Affected Environment

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

Environmental Consequences

Proposed Action

At present, no Native American concerns are known within the project area and none were identified during the inventories. The Ute Tribe of the Uintah and Ouray Bands, the primary Native American tribe in this area of the CRVFO, have indicated that they do not wish to be consulted for small projects or projects where no Native American areas of concern have been identified either through survey or past

consultations. Therefore, formal consultation was not undertaken. If new data are disclosed, new terms and conditions may have to be negotiated to accommodate their concerns.

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

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

No Action Alternative

The No Action Alternative constitutes denial of the APDs and denial of the BLM right-of-way associated with the Proposed Action. Under the No Action Alternative, none of the proposed developments described in the Proposed Action would take place. However, production activities would continue for the existing Fee wells and any new Fee wells developed under the authority of the COGCC. For these wells and associated activities, impacts would be as described above for the Proposed Action.

Noise

Affected Environment

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 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 area, ambient sound levels are expected to be approximately 30 to 40 dBA (EPA 1974, Harris 1991). As a basis for comparison, the noise level during normal conversation of two people 5 feet apart is 60 dBA. The project would be located in a rural, unpopulated area with few potential noise sources. Noise levels from human activity in the project vicinity are mostly mechanical, consisting mainly of existing oil and gas wells, new exploration activities, and ranching/farming operations. These noises are widely dispersed throughout the area, with localized impacts from vehicular traffic.

Environmental Consequences

Proposed Action

The project would result in increased levels of noise during the construction, drilling, and completion phases. The noise would be most noticeable along the roads used to haul equipment and at the pad location. Drilling activities are subject to noise abatement procedures as defined in the COGCC Rules and Regulations (Aesthetic & Noise Control Regulations). Operations involving pipeline or gas facility installation or maintenance, the use of a drilling rig, completion rig, workover rig, or stimulation are subject to the maximum permissible noise levels for industrial zones. The 2006 revised COGCC noise control rules call for noise levels from oil and gas operations at any well site and/or gas facility to comply with the maximum permissible levels (Table 5) at a distance of 350 feet.

Table 5. Noise Standards for Light industrial, Residential/Agriculture/Rural		
<i>Zone</i>	<i>7:00 A.M. to 7:00 P.M</i>	<i>7:00 P.M. to 7:00 A.M</i>
Light Industrial	70 dBA	65 dBA
Residential/Agricultural/Rural	55 dBA	50 dBA

Given the remote locations of the proposed project activities, with no reasonably close occupied structure or designated recreational area, the light industrial standard is applicable. The allowable noise level for periodic impulsive or shrill noises is reduced by 5 dBA from the levels shown (COGCC 2006).

Short-term (7- to 14-day) increases in nearby noise levels would characterize road and well pad construction while the existing cuttings trench is re-opened. Based on the Inverse Square Law of Noise Propagation (Harris 1991) and an typical noise level for construction sites of 65 dBA at 500 feet (Table 6), project-related noise levels would be approximately 59 dBA at a distance of 1,000 feet, approximating active commercial areas (EPA 1974).

Table 6. Noise Levels at Typical Construction Sites and along Access Roads			
<i>Equipment</i>	<i>Noise Level (dBA)</i>		
	<i>50 feet</i>	<i>500 feet</i>	<i>1,000 feet</i>
Air Compressor, Concrete Pump	82	62	56
Backhoe	85	65	59
Bulldozer	89	69	63
Crane	88	68	62
Front End Loader	83	83	57
Heavy Truck	88	68	62
Motor Grader	85	65	59
Road Scraper	87	67	61
Tractor, Vibrator/Roller	80	60	54
Sources: BLM (1999a), La Plata County (2002)			

Traffic noise would also be elevated as a consequence of the Proposed Action. The greatest increase would be along access roads during the drilling and completion phases. Based on the La Plata County data presented in Table 6, approximately 68 dBA of noise (at 500 feet) would be created by each fuel and water truck that travels these roads. Less noise would be created by smaller trucks and passenger vehicles

such as pickup trucks and sport utility vehicles. Although the duration of increased noise from this source would be short, it would occur repeatedly during the drilling and completion phases.

Noise impacts would decrease during the production phase but would remain background noise levels. During maintenance and well workover operations, noise levels would temporarily increase above those associated with routine well production. However, since no residences occur within several miles of the project area or access road, noise impacts associated with the Proposed Action would be negligible.

No Action Alternative

This alternative would not have an impact on existing noise levels, because the development activities would not occur. However, any future Fee wells developed under the authority of the COGCC would have the same potential for noise impacts as described above for the Proposed Action.

Special-Status Species

Federally Listed, Proposed, or Candidate Plant Species

Affected Environment

Federally Listed, Proposed, or Candidate Plant Species

According to the latest species list from the USFWS, the following Federally listed, proposed, or candidate plant species may occur within or be impacted by actions occurring in Garfield County: Parachute beardtongue (*Penstemon debilis*), DeBeque phacelia (*Phacelia submutica*), Colorado hookless cactus (*Sclerocactus glaucus*), Ute ladies'-tresses orchid (*Spiranthes diluvialis*), and Cathedral Bluffs meadow-rue (*Thalictrum heliophilum*).

Environmental Consequences

Proposed Action

The project area contains no habitat for Federally listed, proposed, or candidate plant species. Therefore, the project would have “**No Effect**” on these species.

No Action Alternative

Because no potential habitat for any Federally listed, proposed, or candidate plant species is present in the project area, the No Action Alternative, including ongoing production of existing Fee wells and development of any new Fee wells under the authority of the COGCC, would not adversely affect these species.

Federally Listed, Proposed, or Candidate Animal Species

Affected Environment

Eight species of Federally listed, proposed, or candidate threatened or endangered vertebrate species occur within Garfield County or may be affected by projects within the County. These species, their status, and their distributions and habitat associations in the region are summarized below:

Canada Lynx (*Lynx canadensis*). Federally listed as threatened. Canada lynx occupy high-latitude or high-elevation coniferous forests characterized by cold, snowy winters and an adequate prey base (Ruggiero et al. 1999). The preferred prey of Canada lynx throughout their range is the snowshoe hare (*Lepus americanus*). In the western United States, lynx are associated with mesic forests of lodgepole pine, subalpine fir, Engelmann spruce, and quaking aspen in the upper montane and subalpine zones, generally between 8,000 and 12,000 feet in elevation. Although snowshoe hares are the preferred prey in Colorado, lynx in also feed on other species such as the mountain cottontail (*Sylvilagus nuttallii*), pine squirrel (*Tamiasciurus hudsonicus*), and dusky grouse (*Dendragapus obscurus*).

The U.S. Forest Service (USFS) has mapped suitable denning, winter, and other habitat for lynx within the White River National Forest (WRNF), portions of which are adjacent to BLM lands within the CRVFO. The mapped suitable habitat in the WRNF comprises several areas known as Lynx Analysis Units (LAUs). The project area borders the Battlement LAU and is located within suitable habitat, though due to the pads being on private land, it is not mapped as such.

Mexican Spotted Owl (*Strix occidentalis*). Federally listed as threatened. This large owl nests, roosts, and hunts in mature coniferous forests in canyons and foothills. The only extant populations in Colorado are in the Pikes Peak and Wet Mountain areas of south-central Colorado and the Mesa Verde area of southwestern Colorado. Because no known occurrences or suitable habitats are present in the project vicinity, this species is not considered further.

Western Yellow-billed Cuckoo (*Coccyzus americanus occidentalis*). Candidate for Federal listing. This secretive species occurs in mature riparian forests of cottonwoods and other large deciduous trees with a well-developed understory of tall riparian shrubs. Riparian areas in the project area do not provide suitable habitat for this species. It also is not known to occur in the cottonwood corridor along the Colorado River a few miles north of the project area; occurrence there is unlikely due to the patchy nature of the stands and the general lack of a tall-shrub understory.

Razorback Sucker (*Xyrauchen texanus*), Colorado Pikeminnow (*Ptychocheilus lucius*), Humpback Chub (*Gila cypha*), and Bonytail (*G. elegans*). Federally listed as endangered. These four species of Federally listed big-river fishes 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 a few miles north of the project 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 chub, at Black Rocks west of Grand Junction, is known to exist in Colorado.

Greenback Cutthroat Trout (*Oncorhynchus clarki stomias*). Federally listed as threatened. The greenback cutthroat trout was not identified on the USFWS list for Garfield County; however, recent surveys have identified a population in Cache Creek, located several drainages east of the project area. The greenback is the subspecies of cutthroat trout native to the Platte River drainage on the Eastern Slope of Colorado, while the Colorado River cutthroat trout (*O. c. pleuriticus*) is the subspecies native to Garfield County and throughout the Western Slope of Colorado. Although the occurrence of greenbacks in Cache Creek and potentially elsewhere in the CRVFO and WRNF areas is apparently the result of human intervention (e.g., sanctioned or *ad hoc* translocation of fish from the Eastern Slope), its status as threatened applies to Western Slope populations. However, because drainages within the project area do not support this species, it is not considered further.

Environmental Consequences

Proposed Action

The Mexican spotted owl and western yellow-billed cuckoo are not expected to occur in the project vicinity based on documented occurrences and habitats present. Therefore, the Proposed Action would have “**No Effect**” on these species.

Canada Lynx – Direct impacts would occur in areas considered suitable Canada lynx winter and denning habitat on private surface. No direct impacts would occur within mapped denning, winter or other habitat on Federal lands. This private land consists mainly of mixed conifer and aspen. These stands of aspen and mixed conifer are connected from larger, more continuous lynx habitat, though the proposed pad locations are on the edge of the LAU. The dense vegetation provides a visual screen from project areas and attenuates sounds associated with vehicular traffic and equipment. Moreover, the project would not remove any remove only 0.25 acres of habitat all within private lands.

Based on the information summarized above, a Biological Assessment (BA) for the Canada lynx, prepared by BLM and submitted to the USFWS on November 15, 2010, pursuant to Section 7 of the ESA (BLM 2010a), reached an effects determination of “**May Affect, Not Likely to Adversely Affect**” for the Canada lynx as a result of the development of the project. The USFWS issued a letter on December 13, 2010 concurring with this determination.

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

No Action Alternative

Under the No Action Alternative, no additional construction or development activities would take place. Therefore, impacts to Federally Listed, Proposed, or Candidate Animal Species would be the less than under the Proposed Action.

BLM Sensitive Plant Species

Affected Environment

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

Environmental Consequences

Proposed Action

No BLM sensitive plant species or their habitats are present in the vicinity of the Proposed Action. Therefore, no impacts to these species would occur.

No Action Alternative

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

BLM Sensitive Animal Species

Affected Environment

BLM sensitive animal species with habitat and/or occurrence records in the portion of the CRVFO that includes the project area and vicinity are listed in Table 7. The analysis area provides suitable habitat for the following BLM sensitive wildlife species: fringed myotis (*Myotis thysanodes*), Townsend’s big-eared bat (*Corynorhinus townsendii*), and northern goshawk (*Accipiter gentilis*). BLM sensitive fish species not present within or adjacent to the project area but occurring in the vicinity include the flannelmouth sucker (*Catostomus latipinnis*), bluehead sucker (*C. discobolus*), and roundtail chub (*Gila robusta*). The Colorado River cutthroat trout (*Oncorhynchus clarki pleuriticus*) may also occur in the vicinity.

Table 7. Special-Status Wildlife Species Present or Potentially Present in the Project Area		
Common Name	Habitat	Potential for Occurrence
Fringed myotis, Townsend’s big-eared bat	Breeds and roosts in caves, trees, mines, and buildings; hunts over pinyon-juniper, montane conifers, and semi-desert shrubs.	Possible
Northern goshawk	Predominantly uses spruce/fir forests but will also use Douglas-fir, various pines, and aspens.	Possible
Bald eagle	Nests and roosts in mature cottonwood forests along rivers, large streams, and lakes.	Present along Colorado River
Brewer’s sparrow	Sagebrush shrublands, mountain parks; may be found in alpine willow stands.	Unlikely
Great Basin Spadefoot	Habitat includes pinyon-juniper woodlands, sagebrush, and semi-desert shrublands	Unlikely
Northern leopard frog	Wet meadows and the shallows of marshes, glacial kettles, beaver ponds, lakes, reservoirs, streams, and irrigation ditches.	Unlikely
Midget faded rattlesnake	High, cold desert dominated by sagebrush and with an abundance of rock outcrops and exposed canyon walls.	Unlikely
Colorado River cutthroat trout	Restricted to small headwaters streams isolated from introductions or colonization by non-native trouts.	Present in Beaver Creek
Flannelmouth sucker, bluehead sucker, roundtail chub	Generally restricted to rivers and major tributaries.	Present in Colorado River

Environmental Consequences

Proposed Action

Fringed Myotis (*Myotis thysanodes*) and Townsend's Big-eared Bat (*Corynorhinus townsendii*) – These species hunt at night for aerial insects over pinyon-juniper woodlands, montane conifer woodlands, and semi-desert shrublands. These bats sometimes roost in tree cavities, and the mixed conifer and aspen could support use. Since the pad already exists, new disturbance would be only 0.25 acre, all on private land. No caves occur in the project vicinity, although the areas of mixed conifer and aspen could receive some use for roosting. Lower elevation habitats along the access road have the greatest potential for use as feeding sites, although construction activities would not occur at night when the bats are feeding.

Northern Goshawk – This species is mostly limited to spruce/fir or aspen forests, such as this proposed project area. If there were nests found in the area, the operator would be required to adhere to a 60-day Timing Limitation to protect nesting goshawks. The 0.25 acre of new disturbance would not lead to additional impacts in habitat loss, but drilling of the well would displace birds away from preferred habitats for a short time due to noise and human presence.

Brewer's Sparrow – The project vicinity contains limited and marginal habitat for the Brewer's sparrow, which generally is restricted to extensive, uniform stands of sagebrush, primarily sagebrush steppe. If the species were to occur, oil and gas activities occurring within the home range of a nesting pair could cause individuals to shift their feeding patterns and to locate their nests to avoid the disturbance (noise, dust, human activity). However, this impact would be limited to the nesting season and would not be an issue for long-term production and maintenance operations.

Great Basin Spadefoot – This species generally inhabits seasonal pools and ponds in pinyon-juniper woodland, sagebrush, and semi-desert shrubland habitats, mostly below 6,000 feet in elevation. The project vicinity is of marginal suitability for this species, and spadefoots have not been discovered during surveys of nearby streams.

Northern Leopard Frog – Unlike the spadefoot, the northern leopard frog is limited to perennial waters, including ponds and slow-flowing perennial streams or persistent portions of intermittent streams. They require streams with good water quality and abundant aquatic or shoreline vegetation. Because the project would not involve new habitat disturbance, impacts to this species are not expected.

Midget Faded Rattlesnake – The midget faded rattlesnake is a small, pale-colored subspecies of the common and widespread western rattlesnake. The midget faded rattlesnake is endemic to a small area of southwestern Wyoming, northeastern Utah, and northwestern Colorado, including western Garfield County. Suitable habitats include sandy and rocky areas in pinyon-juniper and semi-desert shrub. The relatively densely vegetated and generally north-facing aspects of the plan area are less suitable than the more barren south-facing areas north of I-70.

Colorado River Cutthroat Trout – Remaining populations of this subspecies of cutthroat trout occur mostly in headwater streams and lakes of the Colorado River drainage. This includes Battlement Creek, which is located generally southwest of the plan area and is within close proximity of the project area in Section 36. The most recent sampling that took place in July 2006 by CRVFO fisheries personnel confirmed the occurrence of the Colorado River cutthroat trout in Battlement Creek. However, because minimal habitat loss would occur, and with measures to protect surface waters from inflow of sediments or pollutants associated with oil and gas activities, the potential for adverse impacts is low. The greatest risks would be associated with spillage of produced water, condensate, or other chemicals into Battlement Creek as a result of a truck accident.

Flannelmouth Sucker and Roundtail Chub – As with the ecologically similar Colorado River endangered fishes described above, the flannelmouth sucker and roundtail chub are adapted to naturally high sediment loads and therefore would not be affected by increased sediment transport to the Colorado River, in the unlikely event that this were to occur as a result of the project. Protective COAs for water quality would minimize this potential (Appendix A). These species are vulnerable to alterations in flow regimes in the Colorado River (including evaporative losses from dams and depletions from withdrawal of water for irrigation or municipal water supplies) that affect the presence of sandbars and seasonally flooded overbank areas needed for reproduction. The small amount of water consumption associated with the Proposed Action would not cause discernible impacts to the Colorado River flow regime.

Bluehead Sucker – This species is found throughout the middle and upper Colorado River Basin, in a variety of areas from headwater streams to large rivers (Woodling 1985). The bluehead sucker prefers areas with a rock substrate and mid to fast flowing waters. If this species were present, the greatest risks would be associated with spillage of produced water, condensate, or other chemicals Battlement Creek as a result of a truck accident.

No Action Alternative

Under the No Action Alternative, no additional construction or development activities would take place. Therefore, impacts to BLM Sensitive Animal Species would be the less than under the Proposed Action.

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 & Development, Draft Supplemental Environmental Impact Statement (BLM 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. Pertinent of the Federal laws dealing with hazardous materials contamination are as follows:

- The Oil Pollution Act (Public Law 101-380) prohibits discharge of pollutants into waters of the US, which by definition would include any tributary, including any dry wash that eventually connects with the Colorado River.
- The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)(Public Law 96-510) provides for emergency response, cleanup, and compensation associated with releases of hazardous substances into the environment. It also provides national, regional, and local contingency plans. Applicable emergency operations plans in place include the National Contingency Plan (NCP)(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 U.S. Army Corps of Engineers and may be subject to Nationwide Permit Number 38.
- The Resource Conservation and Recovery Act (RCRA) (Public Law 94-580) regulates the use of hazardous substances and disposal of hazardous wastes. Note: While oil and gas lessees are exempt from RCRA, right-of-way holders are not. RCRA strictly regulates the management and disposal of hazardous wastes.

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

Environmental Consequences

Proposed Action

Possible pollutants that could be released during the construction phase of this project would include diesel fuel, hydraulic fluid, and lubricants. These materials would be used during construction of the road, pad, and pipeline and for refueling and maintaining equipment and vehicles. Potentially harmful substances used in 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.

No Action Alternative

The No Action Alternative would result in the same types of risks of releases or spills of hazardous or solid wastes into the environment in conjunction with existing and any new Fee wells drilled under the authority of the COGCC. However, because the Federal wells would not be approved, the risks would be somewhat less.

Water Quality, Surface and Ground

Surface Water

Affected Environment

The existing locations lie within two separate USGS 6th-code hydrologic unit watershed. The area where proposed activities for the 35L pad would occur is within the Dry Creek unit, which empties directly into the Colorado River approximately 6 miles to the northwest. The area of the 36L pad is within the Battlement Creek unit, which empties directly into the Colorado River approximately 7 miles to the north.

According to the *Stream Classifications and Water Quality Standards* (CDPHE, Water Quality Control Commission [WQCC] Regulation No. 37) (CDPHE 2010), unnamed ephemeral drainages that drain most of the project vicinity are within segment 4a, which includes tributaries to the Colorado River from its confluence with the Roaring Fork River to a point immediately below its confluence with Parachute Creek. Pad 35L is located near an intermittent branch of Battlement Creek, and 36L is located near an intermittent branch of Dry 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.

All streams within segment 4a are on the State of Colorado’s *303(d) List of Water Quality Limited Segments Requiring TMDLS* (CDPHE, WQCC Regulation No. 93) for naturally high levels of selenium. Additionally the tributaries to the Lower Colorado River which include the project area are on the State of Colorado’s *Monitoring and Evaluation List* for sediment load (CDPHE, WQCC Regulation No. 93) (CDPHE 2010). Table 8 presents the limited streamflow and water quality data collected by the USGS at sites along Battlement Creek (USGS 2007).

Parameter	Battlement Creek near Parachute, CO	
	Site #392620107 8/8/1979	Site #09092600 4/27/1977
Instantaneous discharge (cfs)	8.2	NA
Temperature, water (°C)	17.5	7.0
Field pH (standard units)	8.2	8.0
Specific conductance (µS/cm/cm at 25°C)	135	410
Total Dissolved Solids (mg/L)	NA	270
Hardness as CaCO ₃ (mg/L)	61	220
Chloride (mg/L)	0.6	230
Selenium (µg/L)	NA	1.0
Dissolved oxygen (mg/L)	NA	7.2
Source: USGS 2007 NA = data not available		

No sediment measuring stations are located on the Colorado River or its tributaries near the 35L and 36L pads.

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 caused by further disturbance on the existing pads, increased traffic, and contamination by drilling fluids, produced water, or condensate. Surface waters would be most susceptible to sedimentation during drilling and completion activities. After this period, reclamation activities would substantially reduce surface exposure, decreasing the risk to surface waters over the long term.

Although surface waters would be most susceptible to sedimentation over the short term, access roads will continue to be traveled 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 roads and the remaining disturbed areas of the pads would be reduced through the implementation of Best Management Practices (BMPs) and other preventive measures. As proposed, these measures would include limiting cut slope steepness, step-cutting, crowning road surfaces, installing culverts and drainage systems, and applying gravel to all upgraded BLM roads in the project area to a compacted thickness of 6 inches (Appendix A).

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

Tanks used to store produced water and condensate would be placed in secondary containment to prevent offsite release. In the event of an accidental release, produced water and condensate would be confined for cleanup in a containment area and would not migrate to surrounding soils or surface waters. Pipelines associated with the transport of these liquids would be pressure tested to detect leakage prior to use. Cuttings pits must be decontaminated to COGCC standards prior to pit closure.

Implementation of the standard COAs for mitigating impacts to surface waters (Appendix A) would minimize risks of adverse impacts associated with construction and ongoing production activities.

No Action Alternative

The No Action Alternative would constitute denial of the Federal wells as proposed. Production of existing wells and drilling of any new Fee wells under the authority of the COGCC would result in the same types of potential impacts to surface waters as described above for the Proposed Action.

Waters of the U.S.

Affected Environment

Waters of the U.S. located in the project vicinity include the mainstem and tributaries of Battlement and Dry Creeks. Section 404 of the Clean Water Act requires a Department of the Army permit from the U.S. Army Corps of Engineers (USACE) prior to discharging dredged or fill material into waters of the U.S. as defined by 33 CFR Part 328.

Environmental Consequences

Proposed Action

No new crossings of waters of the U.S. are included in the Proposed Action, nor is pad expansion proposed that could discharge fill into Waters of the U.S. Improperly designed crossings of small ephemeral drainages, in particular any undersized or poorly aligned culverts, could result in soil degradation, including erosion at culvert outlets. This could potentially supply sediment to the Colorado River approximately 6 to 7 miles to the north. However, standard and site-specific surface-use COAs listed in Appendix A would be implemented to protect Battlement and Dry Creeks, the Colorado River, and any other waters of the U.S. potentially impacted by stormflow runoff from the pad.

No Action Alternative

The No Action Alternative would constitute denial of the Federal wells as proposed. However, Fee wells drilled under the authority of the COGCC would result in the same types of potential for impacts to waters of the U.S. as described above for the Proposed Action.

Groundwater

Affected Environment

The project area is located within the Division of Water Resources (DWR) Water Division 5, which encompasses Garfield County (Topper et al. 2003). Groundwater in this division is generally found in alluvial and sedimentary aquifers.

The major alluvial aquifer in the project area is the Colorado River Basin (CRB). The Colorado River represents the largest surface water outflow in the state. Alluvial groundwater is tributary to the stream system and is managed as if it were surface water. Alluvium in the Colorado River Basin generally consists of unconsolidated boulders, cobbles, gravel, sand, silt, and clay. The thickness of the alluvium is variable, but tends to be thinner in the upper reaches and thicker in the lower reaches. Generally, alluvial well depths are less than 200 feet and typically range from 20 to 40 feet. The quality of alluvial groundwater in the CRB can vary widely, and is affected by return flow quality, mineral weathering and dissolution, cation-anion exchange with alluvial minerals and organic compound loading from fertilizer and pesticide leaching.

The major sedimentary aquifer in the project area is the Piceance Basin. The basin is a structural basin, geologically downwarped and surrounded by uplifts. The uplifting has resulted in the filling of the basin with sediments eroded from highlands. The sediments are derived from rocks of Tertiary and Late Cretaceous age. The project area lies in the southern portion of the Piceance Basin, which is drained by a number of tributary creeks that flow into the Colorado River. Most of the groundwater recharge is provided by winter precipitation and stored as snowpack at higher elevations. Sources of Piceance Basin groundwater resources in the project area are from the Mesaverde Group.

No water wells have been developed within the project area; however, seven water wells are located within 1 mile. The depths of the wells range from 7 to 98 feet (although six have been subsequently abandoned). Use of the wells is primarily domestic; it can therefore be assumed that the water is fit for human consumption.

Environmental Consequences

Proposed Action

Groundwater resources in the project area could be adversely affected by the drilling operations and water storage components of the Proposed Action. Contamination of groundwater could result from drilling fluids or petroleum constituents. However, isolation of water-bearing formations during the installation of production casing would minimize the effects. A review of the 10-point drilling plan associated with the Proposed Action indicates that any shallow groundwater zones encountered during drilling would be adequately protected. It is highly unlikely that the deeper 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 produced from migrating to potable water zones.

The reserve pit (if used) on each new well pad would be lined to ensure that drilling mud or produced water would not affect groundwater resources. The reserve pit would be constructed so as not to leak, break, or allow discharge. Specific requirements related to reserve pits are presented in Appendix A.

No Action Alternative

There would be no new effects from the implementation of the No Action Alternative. Ongoing natural gas development in the project area would be the primary source of impacts to groundwater sources. However, since the same protective measures are being implemented on other developments, including Fee wells under the authority of the COGCC, impacts from the No Action Alternative would be similar to those of the Proposed Action.

Paleontology

Affected Environment

Vertebrate fossils are known to occur in the Wasatch Formation within the project area. The Paleocene-Eocene Wasatch Formation includes mammals, birds, reptiles, fish, fresh water clams, snails, and plants. Important invertebrate fossils are known from the Parachute Creek member of the Green River Formation. The Eocene Green River Formation includes fossil insects (over 100 species), as well as plants, gar, turtles, and crocodilians.

The project area is heavily vegetated and covered with thick soil deposits. In addition, examination of BLM's paleontology database and consultation with BLM's Regional Paleontologist indicate no known fossil deposits in the project vicinity. It is therefore unlikely that a field survey would provide additional information indicating the presence of significant fossil resources.

Environmental Consequences

Proposed Action

Construction of oil and gas facilities, including access roads and well pads, has the potential to damage or destroy scientifically important fossils, particularly during excavation of surface sediments and shallow bedrock. However, based on the small amount of new surface disturbance associated with adding Federal wells to the existing 35L and 36L pads and the site-specific conditions described above, the potential for impacts to fossils is very low. Nonetheless, a standard paleontological COA (Appendix A) would be attached to the APDs (Appendix A) to ensure protection in the event that paleontological resources are encountered.

No Action Alternative

The potential for Under the No Action Alternative, no impacts to paleontological resources would occur.

Socio-Economics

Affected Environment

The project area is located within Garfield County, Colorado. The population of Garfield County grew by approximately 2.7% 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% 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% of total employment.

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

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

The growth of the oil and gas industry in the past 10 years has been increasingly important to local economies (BLM 2006). Gas production in Garfield County has increased tremendously during the past eight years from 70 billion cubic feet (BCF) in 2000 to more than 376 BCF in 2008 (COGCC 2009). In addition, Garfield County is experiencing the fastest oil and gas development in Colorado with 3,000 drilling permits currently approved (COGCC 2009). While the number of workers employed in the mining and extraction industry in Garfield County has been shown to be only 1.7%, this number is considered misleading because some oil and gas employment has been incorporated as part of the construction sector statistics instead (BLM 2006). For example, in the year 2005, an estimated 4,000 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 (USFS), U.S. Fish and Wildlife Service (USFWS), and National Park Service (NPS). The amount may also be adjusted based on population and as appropriated by Congress. By formula, payments are decreased as other Federal funds, such as mineral royalty payments, increase. PILT received by Garfield County in the last four years has been as follows: \$1,170,205 in 2004; \$808,348 in 2005; \$1,065,158 in 2006; and \$1,078,087 in 2007 (USDI 2008).

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

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

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

Environmental Consequences

Proposed Action

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

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

No Action Alternative

The No Action Alternative would result in no additional impacts to socio-economics of the general area, other than those accompanying development of Fee wells on the 35L and 36L well pads under the authority of the COGCC.

Soils

Affected Environment

The proposed project is covered by the *Soil Survey of Rifle Area, Colorado* (NRCS 2010, USDA 1985). According to this survey the Proposed Action area would occur on entirely on the Cochetopa Loam soil type. The area is generally characterized by rolling mountainsides and alluvial fans with elevations ranging from 7,000 to 9,500 feet. The gradients range from 9% to 50%, gentle in the valleys to steep along mountainsides. The soils are formed in basaltic alluvium and are well drained. The top surface layer is a loam about 21 inches thick, with underlying stony clay loam from 21-30 inches and stony clay from 30 to 60 inches. Permeability is slow, surface runoff is slow and available water capacity is high. The erosion hazard is severe.

Environmental Consequences

Proposed Action

The Proposed Action would involve vegetation and soil removal for two expanded well pads. The Proposed Action would result in approximately 4.3 acres of additional short-term vegetation loss and soil disturbance, with a long-term loss of an additional 1.3 acres. In general, the area that would be affected by the Proposed Action contains adequate vegetation buffers and low to moderate slopes that would reduce the potential for sediment transport to Battlement and Dry Creeks. 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 may decrease the soil fertility and revegetation potential. Such impacts should be adequately mitigated by proper utilization of the standard and site-specific COAs. Following interim reclamation, it would 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.

No Action Alternative

The No Action Alternative would constitute denial of the Federal wells as proposed. However, Fee wells drilled under the authority of the COGCC would result in the same potential for impacts to soils as described above for the Proposed Action.

Vegetation

Affected Environment

The project occurs in a mixed woodland of quaking aspen interspersed with stands of Engelmann spruce and subalpine fir. Numerous native shrubs, forbs, and grasses are found in the understory.

Environmental Consequences

Proposed Action

Under the Proposed Action, approximately 0.25 acre of new disturbance would occur on private land. The existing disturbance of 9.6 acres of private land would be reduced to 4.3 acres following successful interim reclamation. With implementation of standard conditions of approval (Appendix A), desirable forbs and grasses on the unused portions of the pad, road, and pipeline could be established within 2 to 3 years. However, because of periodic workovers and the potential for additional well bores in the future, it is likely that vegetation would remain in an early seral stage for the life of the wells.

No Action Alternative

Under the No Action Alternative, no additional construction or development activities would take place. Therefore, impacts to vegetation would be the same as under the Proposed Action. Operations and maintenance activities of the existing pad would continue but would not impact additional vegetation.

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

Affected Environment

Battlement Creek is a perennial stream in Section 36 southeast of the project area and is a tributary to the Colorado River. A native trout subspecies, the Colorado River cutthroat trout, is known to occur in Battlement Creek. This subspecies is listed as sensitive by the BLM; see the section on Special-Status Species for detailed information. Fish surveys by CDOW and USFS have documented the presence of greenback cutthroat trout—a Federally listed threatened subspecies—in upper reaches of Cache Creek, located two drainages to the east.

Aquatic macroinvertebrates living in perennial streams such as Battlement Creek during a portion of their lifecycles include larvae of stoneflies, mayflies, and some caddisflies in fast-flowing reaches with rocky or detrital substrates. Both the aquatic larvae and winged adults of stoneflies, mayflies, and caddisflies are probably the main prey for trout in Battlement Creek, along with terrestrial invertebrates that land or fall onto the surface or are carried into the stream in runoff from adjacent uplands. In slow-flowing portions of Battlement Creek with fine substrates, aquatic macroinvertebrates probably include the larvae of midges, mosquitoes, and some caddisflies. These species are able to tolerate relatively warm, turbid, and poorly oxygenated waters, and their more abbreviated larval stages allow them to reproduce in intermittent streams and in seasonally inundated overbank areas.

Environmental Consequences

Proposed Action

Since no construction would occur outside the previously disturbed area of the pad, the Proposed Action would not directly affect Battlement Creek, the Colorado River, or the species that inhabit these waters. The greatest risks would be associated with spillage of produced water, condensate, or other chemicals into Battlement Creek as a result of a truck accident.

No Action Alternative

The No Action Alternative constitutes denial of the APD associated with the Proposed Action. However, Fee wells drilled under the authority of the COGCC would have the same impacts to aquatic wildlife and described above for the Proposed Action.

Wildlife, Terrestrial

Affected Environment

Terrestrial wildlife habitats and the baseline conditions that affect habitat availability and quality are presented in the Vegetation section of this EA. Habitats present are predominantly aspen woodlands interspersed with subalpine fir/Engelmann spruce forest. The project vicinity provides habitats for various species of big game, small game, and nongame mammals and birds that are found in low- to mid-elevation habitats of west-central Colorado.

Mammals

The site is located within summer range for both mule deer (*Odocoileus hemionus*) and Rocky Mountain elk (*Cervus elaphus nelsoni*), including a summer concentration area for elk, and is also an elk production area as mapped by CDOW (2008). Summer range is defined as the part of the range where 90% of the

individuals are located between spring green-up and the first heavy snowfall, or during a site-specific period of summer as defined for each Data Analysis Unit (DAU). Summer concentration areas are areas where elk concentrate from mid-June through mid-August. These areas are known for their high quality forage, security, and lack of disturbance, which contribute to meeting the energy demands associated with coming rut and the winter season. Elk production areas are that part of the overall range of elk occupied by females from May 15 to June 15 for calving. The lush forage, proximity to water, and thermal and hiding cover provided by these areas contribute to meeting the energy demands of lactation and calf rearing.

Large carnivores present in the project vicinity include the mountain lion (*Puma concolor*) and black bear (*Ursus americanus*). CDOW (2008) has mapped all of the analysis area as black bear (*Ursus americanus*) overall range and black bear fall concentration area (CDOW 2008). This reflects the abundance of large quantities of mast and berries necessary to establish fat reserves for the winter hibernation period. Mountain lions move seasonally to generally follow migrations of their preferred prey, mule deer. Two medium-sized carnivores, the coyote (*Canis latrans*) and bobcat (*Lynx rufus*), are also present throughout the region in open habitats and broken or wooded terrain, respectively, where they hunt for small mammals, reptiles, and ground-dwelling birds. Smaller carnivores in habitats similar to those near the project site include the ringtail (*Bassariscus astutus*) and spotted skunk (*Spilogale gracilis*).

Small mammals present within the planning area include rodents such as the rock squirrel (*Spermophilus variegatus*), golden-mantled ground squirrels (*Spermophilus lateralis*), least chipmunk (*Tamias minimus*), and packrat (bushy-tailed woodrat) (*Neotoma cinerea*), as well as the mountain cottontail (*Sylvilagus nuttallii*). Rodents and, to a lesser extent rabbits, are the primary prey base for a variety of avian and mammalian predators.

Birds

Birds of prey may nest in conifers, aspen, or very tall oaks associated with the project area, although no raptor nests were found during project-specific surveys. Raptors that are potentially present are the northern goshawk, flammulated owl, and boreal owl, as well as the great horned owl (*Bubo virginiana*), and saw-whet owl (*Aegolius acadicus*),

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 for both foraging and nesting in trees such as Douglas-fir or aspen. A raptor survey is to be completed prior to the start of any construction, drilling, or completion activities due to the most recent one having expired in 2010.

One gallinaceous species, the wild turkey (*Meleagris gallopavo*), is common in habitat types such as found in the project area, which provide abundant food in the form of plant material and invertebrate prey in the dense leaf litter. Areas containing tall shrubs such as Gambel's oak, serviceberry, and chokecherry are particularly important to turkeys because of the acorns and berries they provide. CDOW has mapped the project area as wild turkey overall habitat. Another upland gamebird, the dusky (blue) grouse (*Dendragapus obscurus*), is potentially present in conifer/aspen habitats, although this species generally occurs at higher elevations.

Reptiles and Amphibians

The project area is above the elevational range of most reptile species known to occur in Garfield County. The species most likely to occur is the western terrestrial garter snake (*Thamnophis elegans*) along

Battlement Creek. Species potentially present at the lowest elevations of the access roads but generally found at lower elevations include the western fence lizard (*Sceloporus undulatus*) and gopher snake (bullsnake) (*Pituophis catenifer*) in upland shrublands and milk snake (*Lampropeltis triangulum*) and smooth green snake (*Opheodrys vernalis*) along West Mamm Creek.

No amphibians are known or expected to occur onsite based on habitat conditions along the drainage. The northern leopard frog and boreal toad are not known to occur in the area according to CDOW mapping.

Environmental Consequences

Proposed Action

Since minimal construction would be associated with the Proposed Action, the greatest impact on wildlife, especially big game and raptors, would be the disturbance caused by increased human activity, equipment operation, vehicle traffic, harassment by any dogs brought to the site by contractors, and noise related to drilling and completion activities. Most species of wildlife are relatively secretive and distance themselves from these types of disturbance or move to different areas screened by vegetation screening or topographic features. This avoidance, referred to as displacement, results in underuse of habitat near the disturbance. Avoidance of forage and cover resources adjacent to disturbance reduces habitat utility and the capacity of the affected acreage to support wildlife populations (BLM 1999a).

No Action Alternative

The No Action Alternative constitutes denial of the APD associated with the Proposed Action. Under the No Action Alternative, the Federal well proposed and described in the Proposed Action would not be drilled, and therefore no impacts to terrestrial wildlife would occur beyond those associated with the two existing pads. However, ongoing production of existing wells and drilling of any new Fee wells under the authority of the COGCC would have the same potential for impacts as described for the Proposed Action.

SUMMARY OF CUMULATIVE IMPACTS

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

Although none of the cumulative impacts described in the 1999 FSEIS was characterized as significant, and while new technologies and regulatory requirements have reduced the impacts of some land uses, it is nonetheless clear that past, present, and reasonably foreseeable future actions has had and would continue to have adverse effects on various elements of the human environment. The anticipated impact levels for existing and future actions range from negligible to locally major, and primarily negative, for specific resources. The primary reasons for this assessment are twofold: (1) the rate of development, particularly oil and gas development, has until recently been increasing in the area, resulting in an accelerated accumulation of individually nominal effects; and (2) residential and commercial expansion, as well as most of the oil and gas development, has occurred private holdings lands where mitigation measures designed to protect and conserve resources are not in effect.

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

PERSONS AND AGENCIES CONSULTED

Noble Energy, Inc – Mike Bonkiewicz, Judi Kohn
 Colorado Oil and Gas Conservation Commission – Dave Kubeczko
 Garfield County Oil & Gas Liaison Office – Nikki Reckles
 Bookcliff Survey Services, Inc.

INTERDISCIPLINARY TEAM REVIEW

BLM staff from the CRVFO who participated in the preparation of this EA—including review of survey results submitted by Noble’s consultants, evaluation of impacts likely to occur from implementation of the Proposed Action, and identification of appropriate COAs to be attached and enforced by BLM—are listed in Table 10.

Table 10. BLM Interdisciplinary Team Authors and Reviewers		
<i>Name</i>	<i>Title</i>	<i>Areas of Participation</i>
Beth Brenneman	Ecologist	Invasive Non-native Species, Special-status Species (Plants), Vegetation
Allen Crockett, Ph.D.	Supervisory Natural Resource Specialist	NEPA Review
Cheryl Harrison	Archaeologist	Cultural Resources, Native American Religious Concerns
William Howell	Petroleum Engineer	Downhole COAs
Shauna Kocman, Ph.D.	Hydrologist	Soils, Surface Water, Waters of the U.S.
Sylvia Ringer	Wildlife Biologist	Migratory Birds, Special-status Species (Animals), Wildlife, Aquatic and Terrestrial
Rebecca Rutan	Natural Resource Specialist	EA Project Lead, Air Quality, Access & Transportation, Noise, Socio-Economics
Todd Sieber	Geologist	Geology and Minerals, Groundwater, Paleontology

REFERENCES CITED

Air Resource Specialists, Inc. 2009. 2008 Air quality summaries for Rifle and Parachute monitoring stations. Provided via e-mail by Cassie Archuleta. Fort Collins, Colorado.

Bureau of Land Management (BLM). 1984. Glenwood Springs Resource Management Plan. Glenwood Springs Field Office, Colorado.

_____. 1991. Record of Decision, Oil and Gas Plan Amendment. Glenwood Springs Field Office, Colorado.

_____. 1998. Oil & Gas Leasing & Development – Draft Supplemental Environmental Impact Statement. Glenwood Spring Field Office, Colorado.

_____. 1999a. Oil & Gas Leasing & Development – Final Supplemental Environmental Impact Statement. Glenwood Spring Field Office, Colorado.

_____. 1999b. Oil & Gas Leasing & Development – Record of Decision and Resource Management Plan Amendment. Glenwood Spring Field Office, Colorado.

_____. 2005. Rifle-West Watershed Land Health Assessment. Glenwood Springs Field Office, Colorado.

_____. 2006. Final Roan Plateau Resource Management Plan Amendment & Environmental Impact Statement, Volume III, Appendix C. Glenwood Springs Field Office, Colorado.

Colorado Department of Public Health and Environment (CDPHE). 2010. Water Quality Control Commission (WQCC), Regulation No. 93, 2006 Section 303(d) List of Water-Quality-Limited Segments Requiring TMDLs, effective April 30, 2010.

<http://www.cdphe.state.co.us/regulations/wqccregs/100293wqlimitedsegmdlsnew.pdf>. accessed 1/7/10

_____. 2007. Water Quality Control Commission (WQCC), Regulation No. 37 Classifications and numeric standards for Lower Colorado River basin and tables. Amended February 8, 2010; effective June 3, 2010.

<http://www.cdphe.state.co.us/regulations/wqccregs/100237wqcclowercoloradoriverbasin.pdf>. Accessed 1/7/10

_____. 2008a. Garfield County background air pollutant concentrations. E-mail sent by Nancy Chick in Air Pollution Control Division on October 14.

_____. 2008b. Regulation Number 7: Control of ozone via ozone precursors. Air Pollution Control Division Document 5CCR1001-9. <http://www.cdphe.state.co.us/regulations/airregs/>.

Cole, R.D., G.J. Daub, and L.K. Weston. 1995. Review of geology, mineral resources, and ground-water hydrology of Green River Formation, north-central Piceance Creek Basin, Colorado. *In* W.R. Averett (Ed.), *The Green River Formation in Piceance Creek and Eastern Uinta Basins: Grand Junction, Colorado*, Grand Junction Geological Society, p. 63-81.

Colorado Division of Water Resources (CDWR). 2008. Guide to Colorado well permits, water rights, and water administration. <http://water.state.co.us/pubs/wellpermitguide.pdf>

_____. 2009. Colorado Decisions Support System online (developed by the CDWR and Colorado Water Conservation Board (CWCB). <http://cdss.state.co.us/dnn/>

Colorado Division of Wildlife (CDOW) 2008. National Diversity Information Source (CDOW-NDIS). Elk and mule deer habitat GIS data.

Cumella, S. 2009. Geology of the Piceance Basin Mesaverde gas accumulation. Adapted from an oral presentation at the American Association of Petroleum Geologists Annual Convention, Denver, June 7-10, 2009. Search and Discovery article #110106, posted July 30.

Donnell, J.R. 1969. Paleocene and lower Eocene units in the southern part of the Piceance Creek basin Colorado, *In* Contributions to stratigraphy, 1968: U.S. Geological Survey Bulletin, 1274-M, p. M1-M18.

- Ellis, M.S., and V.L. Freeman. 1984. Geologic map and cross sections of the Carbondale 30' x 60' quadrangle, West Central Colorado, map C-97-A. U.S. Geological Survey, Denver.
- EnerMax, Inc. 2007. Hydraulic fracturing. <http://www.enermaxinc.com/hydraulic-fracturing>.
- Glover, K.C., D.L. Naftz, and L.J. Martin, L.J. 1998. Geohydrology of Tertiary rocks in the Upper Colorado River basin in Colorado, Utah, and Wyoming, excluding the San Juan Basin, regional aquifer-system analysis: U.S. Geological Survey Water-Resources Investigations Report 96-4105.
- Graham, G. 2001. Colorado Division of Water Resources. Personal communication.
- Harris, C.M. 1991. Handbook of acoustical measurements and noise control, McGraw-Hill, Inc., New York.
- Hemborg, T.H. 2000. Gas production characteristics of the Rulison, Grand Valley, Mamm Creek, and Parachute Fields, Garfield County, Colorado: Turning marginally economic basin-centered tight-gas sands into profitable reservoirs in the Southern Piceance Basin. Colorado Geological Survey, Resource Series 39. Denver.
- Holditch, S.A. 2006. Tight gas sands. Society of Petroleum Engineers Paper 103356, Journal of Petroleum Technology.
- Kuuskræa, V.A. 1997. Producing massively stacked lenticular sands of Colorado's Piceance Basin: Gas Tips – A Publication of Gas Research Institute GRI-97/0206:4-11.
- Lorenz, J.C. 1989. Reservoir sedimentology of rocks of the Mesaverde Group, multiwall experiment site and east-central Piceance Basin, northwest Colorado. In B.E. Law and C.W. Spencer, C.W. (Eds.), Geology of tight gas reservoirs in the Pinedale Anticline area, Wyoming, and at the multiwall experiment site, Colorado: U.S. Geological Survey Bulletin 1886:K1-K24.
- La Plata County, Colorado. 2002. Final La Plata County Impact Report. October.
- Murphy, P.C., Daitch, D. 2007. Paleontological overview of oil shale and tar sands areas in Colorado, Utah, and Wyoming.
- National Academy of Sciences. 2007. Weather and climate extremes in a changing climate. National Academies Press. <http://dels.nas.edu/globalchange/reportDetail.php?id=4288&c=clim&t=pubs>.
- Natural Resources Conservation Services (NRCS) 2010 Soil Data Mart. <http://soildatamart.nrcs.usda.gov>. accessed 1/7/10
- Pima County Wastewater Management Department. 2006. Arid west water quality research project, aquatic communities of ephemeral stream ecosystems, Final Report. Prepared by URS Corporation, Albuquerque, New Mexico, and GEI Consultants, Inc./Chadwick Ecological Division, Littleton, Colorado.
- Pranter, M. J., R.D. Cole, P. Henrikus, and N.K. Sommer. 2009. Sandstone-body dimensions in a lower coastal-plain depositional setting: Lower Williams Fork Formation, Coal Canyon, Piceance Basin, Colorado, AAPG Bulletin 93(10): 1379-1401. October.

Robson, S.G., and G.J. Saulnier, Jr. 1981. Hydrogeochemistry and simulated solute transport, Piceance Basin, northwestern Colorado. U.S. Geological Survey Professional Paper 1196, 65 p.

Shroba, R.R., and R.B. Scott. 1997. Revised preliminary geologic map of the Rifle quadrangle, Garfield County, Colorado. U.S. Geological Survey, OFR OF-97-852, scale 1:24000.

Taylor, O.J. 1987. Hydrologic system of Piceance Basin, *In* Taylor, O.J., compiler, Oil shale, water resources, and valuable minerals of the Piceance Basin, Colorado, the challenge and choices of development: U.S. Geological Survey Professional Paper 1310, p. 63-76.

Tweto, O., R. H. Moench, and J.C. Reed, Jr. 1978. Geologic map of the Leadville 1 degree x 2 degree Quadrangle, Northwestern Colorado. U.S. Geological Survey, Denver.

Utah Geological Survey (UGS). 2009. Utah's Sevier Thrust System. Department of Natural Resources, <http://geology.utah.gov/utahgeo/geo/thrustfault5.htm>. Accessed 01/13/10.

U.S. Department of Agriculture (USDA). 1985. Soil survey of Rifle area, Colorado: parts of Garfield and Mesa Counties. Soil Conservation Service [Natural Resources Conservation Service].

U.S. Department of the Interior and U.S. Department of Agriculture (USDI and USDA). 2007. Surface operating standards and guidelines for oil and gas exploration and development. The Gold Book. Fourth edition.

U.S. Environmental Protection Agency (EPA). 1974. Information on noise levels identified as requisite to protect public health and welfare with an adequate margin of safety. EPA-550/9-74-004, Arlington, VA.

_____. 1996. Stationary internal combustion sources, section 3.3: Gasoline and diesel industrial engines. EPA Document AP 42, Fifth edition, Volume I, Chapter 3. <http://www.epa.gov/ttn/chief/ap42/ch03/index.html>.

_____. 2004. Environmental Protection Agency. Evaluation of impacts to underground sources of drinking water by hydraulic fracturing of coalbed methane reservoirs. EPA 816-R-04-003, Attachment 3, The Piceance Basin, June 2004.

_____. 2005. Examination of the multiplier used to estimate PM_{2.5} fugitive dust emissions from PM₁₀. Presented by T.G. Pace at the 14th International Emission Inventory Conference, Las Vegas, NV.

_____. 2006. Drinking water standards and health advisories, EPA 822-R-06-013, August 2006. <http://www.epa.gov/waterscience/criteria/drinking/dwstandards.html#secondary>. Accessed October 2009.

U.S. Fish and Wildlife Service (USFWS). 2008. Birds of conservation concern. Division of Migratory Bird Management, Arlington, Virginia. 93 pp. [Online version available at http://library.fws.gov/bird_publications/bcc2008.pdf].

U.S. Geological Survey (USGS). 2007. Water Resources of the United States, NWISWeb. Water quality samples for the nation, Colorado River near DeBeque. Available at <http://nwis.waterdata.usgs.gov/nwis/qwdata>. Accessed 1/7/10

Vargas, M.F., and T.L. Davis. 2006. Characterization and 3-D reservoir modeling of fluvial tight-gas sandstones in the Williams Fork Formation, Rulison Field, Piceance Basin, Colorado, USA. American Association of Petroleum Geologists, Annual Convention, (SEPM) Technical Program Abstracts.

Warner, D.L. 1964. Mancos-Mesaverde (Upper Cretaceous) intertonguing relations, Southeast Piceance Basin, Colorado: AAPG Bulletin 48(7): 1091-1107. July.

WestWater Engineering (WWE). 2009. Biological survey report, Cottonwood Gulch natural gas wells and access roads. Prepared for Williams Production RMT Company. June.

Willis, G.C. 1999. The Utah thrust system: an overview. *In* L.W. Spangler and C.J. Allen (Eds.). Geology of northern Utah and vicinity: Utah Geological Association Publication 27: 1-9.

Left blank for two-sided copying.

FONSI
DOI-BLM-CO-N040-2010-0078-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 Proposed Action presented in the attached Environmental Assessment (EA). The Proposed Action includes construction at the existing 35L and 36L pads and associated pipelines, as shown on the plats submitted in the Applications for Permit to Drill (APDs), and the drilling, completion, and production of Federal oil and gas wells on these pads.

Initiation of surface-disturbing activities and of drilling and completion activities associated with Federal oil and gas wells on the 35L and 36L pads shall not commence until approval by BLM of APDs submitted by Noble Energy, Inc.

This decision will provide for the orderly, economical, and environmentally sound exploration and development of oil and gas resources on valid oil and gas leases.

RATIONALE: The bases for this decision are as follows:

1. Approval of the Proposed Action is validating the rights granted with the Federal oil and gas leases to develop the leasehold to provide commercial commodities of oil and gas.
2. The environmental impacts have been mitigated with measures incorporated into the Proposed Action or as specified in the Conditions of Approval (COAs) appended to the EA.

MITIGATION MEASURES: Mitigation measures presented in Appendix A will be applied as COAs for both surface and drilling operations.

NAME OF PREPARER: Rebecca Rutan, Natural Resource Specialist

SIGNATURE OF AUTHORIZED OFFICIAL:



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

SIGNED: Jan. 25, 2011

Left blank for two-sided copying.

APPENDIX A

Surface-Use and Downhole Conditions of Approval

Left blank for two-sided copying.

**STANDARD SURFACE-USE CONDITIONS OF APPROVAL
DOI-BLM-CO-N040-2010-0078-EA**

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

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

Culverts at drainage crossings shall be designed and installed to pass a 25-year or greater storm event. On perennial and intermittent streams, culverts shall be designed to allow for passage of aquatic biota. The minimum culvert diameter in any installation for a drainage crossing or road drainage shall be 24 inches. Crossings of drainages deemed to be jurisdictional waters of the U.S. pursuant to Section 404 of the Clean Water Act may require additional culvert design capacity. Due to the flashy nature of area drainages and anticipated culvert maintenance, the U.S. Army Corps of Engineers (USACE) recommends designing drainage crossings for the 100-year event. Contact the USACE Colorado West Regulatory Branch at 970-243-1199 ext. 17 (Travis Morse).

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

5. Jurisdictional Waters of the U.S. The operator shall obtain appropriate permits from the U.S. Army Corps of Engineers (USACE) prior to discharging fill material into waters of the U.S. in accordance with Section 404 of the Clean Water Act. Waters of the U.S. are defined in 33 CFR Section 328.3 and may include wetlands as well as perennial, intermittent, and ephemeral streams. Permanent impacts to waters of the U.S. may require mitigation. Contact the USACE Colorado West Regulatory Branch at 970-243-1199 ext. 17 (Travis Morse). Copies of any printed or emailed approved USACE permits or verification letters shall be forwarded to the BLM.

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

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

The deadlines for seeding described above are subject to extension upon approval of the BLM based on season, timing limitations, or other constraints on a case-by-case basis. If the BLM approves an extension for seeding, the operator may be required to stabilize the reclaimed surfaces using hydromulch, erosion matting, or other method until seeding is implemented.
 - c. Topsoil Stripping, Storage, and Replacement. All topsoil shall be stripped following removal of vegetation during construction of well pads, pipelines, roads, or other surface facilities. In areas of thin soil, a minimum of the upper 6 inches of surficial material shall be stripped. The BLM may specify a stripping depth during the onsite visit or based on subsequent information regarding soil thickness and suitability. The stripped topsoil shall be stored separately from subsoil or other excavated material and replaced prior to final seedbed preparation. The BLM best management practice (BMP) for the Windrowing of Topsoil (COA number 19) shall be implemented for well pad construction whenever topography allows.
 - d. Seedbed Preparation. For cut-and-fill slopes, initial seedbed preparation shall consist of backfilling and recontouring to achieve the configuration specified in the reclamation plan. For compacted areas, initial seedbed preparation shall include ripping to a minimum depth of 18 inches, with a maximum furrow spacing of 2 feet. Where practicable, ripping shall be conducted in two passes at perpendicular directions. Following final contouring, the backfilled or ripped surfaces shall be covered evenly with topsoil.

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

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

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

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

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

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

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

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

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

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

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

- i. Site Protection. The pad shall be fenced to BLM standards to exclude livestock grazing for the first two growing seasons or until seeded species are firmly established, whichever comes later. The seeded species will be considered firmly established when at least 50% of the new plants are producing seed. The BLM will approve the type of fencing.
 - j. Monitoring. The operator shall conduct annual monitoring surveys of all sites categorized as “operator reclamation in progress” and shall submit an annual monitoring report of these sites to the BLM by **December 31** of each year. The monitoring program shall use the four Reclamation Categories defined in Appendix I of the 1998 DSEIS to assess progress toward reclamation objectives. The annual report shall document whether attainment of reclamation objectives appears likely. If one or more objectives appear unlikely to be achieved, the report shall identify appropriate corrective actions. Upon review and approval of the report by the BLM, the operator shall be responsible for implementing the corrective actions or other measures specified by the BLM.
8. Weed Control. The operator shall regularly monitor and promptly control noxious weeds or other undesirable plant species as set forth in the Glenwood Springs Field Office *Noxious and Invasive Weed Management Plan for Oil and Gas Operators*, dated March 2007. A Pesticide Use Proposal (PUP) must be approved by the BLM prior to the use of herbicides. Annual weed monitoring reports shall be submitted to BLM by **December 1**.
 9. Big Game Winter Range Timing Limitation. To minimize impacts to wintering big game, no construction, drilling or completion activities shall occur during a Timing Limitation (TL) period from **January 1 to March 1 annually**
 10. Bald and Golden Eagles. It shall be the responsibility of the operator to comply with the Bald and Golden Eagle Protection Act (Eagle Act) with respect to “take” of either eagle species. Under the Eagle Act, “take” includes to pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest and disturb. “Disturb” means to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, (1) injury to an eagle; (2) a decrease in its productivity by substantially interfering with normal breeding, feeding, or sheltering behavior; or (3) nest abandonment by substantially interfering with normal breeding, feeding, or sheltering behavior. Avoidance of eagle nest sites, particularly during the nesting season, is the primary and preferred method to avoid a take. Any oil or gas construction, drilling, or completion activities planned within 0.5 mile of a bald or golden eagle nest, or other associated activities greater than 0.5 miles from a nest that may disturb eagles, should be coordinated with the BLM project lead and BLM wildlife biologist and the USFWS representative in the BLM Field Office (970-876-9051).
 11. Raptor Nesting. To protect nesting raptors, a survey shall be conducted prior to construction, drilling, or completion activities that are to begin during the raptor nesting season (February 1 to August 15). The survey shall include all potential nesting habitat within 0.25 mile of a well pad or 0.125 mile of an access road, pipeline, or other surface facility. Results of the survey shall be submitted to the BLM. If a raptor nest is located within the buffer widths specified above, a 60-day Timing Limitation (TL) shall be applied to postpone initiation of construction, drilling, and completion activities. The dates of this TL will be based on the particular species of raptor.
 12. Migratory Birds. It shall be the responsibility of the operator to comply with the Migratory Bird Treaty Act (MBTA) with respect to “take” of migratory bird species. Under the MBTA, “take” means to pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. The operator shall prevent use by migratory birds of any pit containing fluids associated with oil or gas operations, including but not limited to reserve pits, produced water pits, frac-water

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

13. Birds of Conservation Concern. Pursuant to BLM Instruction Memorandum 2008-050, all surface-disturbing activities are prohibited from **May 1 to July 1** 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 within 30 meters (100 feet) of the area to be disturbed. Nesting shall be deemed to be occurring if a territorial (singing) male is present within the distance specified above. Nesting surveys shall include an aural survey for diagnostic vocalizations in conjunction with a visual survey for adults and nests. Surveys shall be conducted by a qualified breeding bird surveyor between sunrise and 10:00 AM under favorable conditions for detecting and identifying a BCC species. This provision does not apply to ongoing construction, drilling, or completion activities that are initiated prior to May 1 and continue into the 60-day period at the same location.
14. Range Management. Range improvements (fences, gates, reservoirs, pipelines, etc) shall be avoided during development of natural gas resources to the maximum extent possible. If range improvements are damaged during exploration and development, the operator will be responsible for repairing or replacing the damaged range improvements. If a new or improved access road bisects an existing livestock fence, steel frame gate(s) or a cattleguard with associated bypass gate shall be installed across the roadway to control grazing livestock.
15. 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.
16. Paleontological Resources. All persons associated with operations under this authorization shall be informed that any objects or sites of paleontological or scientific value, such as vertebrate or scientifically important invertebrate fossils, shall not be damaged, destroyed, removed, moved, or disturbed. If in connection with operations under this authorization any of the above resources are encountered the operator shall immediately suspend all activities in the immediate vicinity of the discovery that might further disturb such materials and notify the BLM of the findings. The discovery must be protected until notified to proceed by the BLM.

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

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

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

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

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

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

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

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

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

18. Visual Resources. All applications for permit to drill (APDs) shall include a detailed, site-specific description outlining how the Proposed Action will meet the VRM Class of the area where the action

is proposed. The specific location of the Proposed Action, including pads, roads, and pipelines, shall be shown on a map and shall include associated cut-and-fill data (location, horizontal and vertical extent, slope length, and steepness).

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

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

Above-ground facilities shall be painted a natural color selected to minimize contrast with adjacent vegetation or rock outcrops. The color shall be specified by the BLM and attached as a COA to individual APDs.

19. Windrowing of Topsoil. Topsoil shall be windrowed around the pad perimeter to create a berm that limits and redirects stormwater runoff and extends the viability of the topsoil per BLM Topsoil Best Management Practices (BLM 2009 PowerPoint presentation available upon request from Glenwood Springs Field Office). Topsoil shall also be windrowed, segregated, and stored along pipelines and roads for later spreading across the disturbed corridor during final reclamation. Topsoil berms shall be promptly seeded to maintain soil microbial activity, reduce erosion, and minimize weed establishment.
20. 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.
21. Soils. Cuts and fills shall be minimized when working on erosive soils and slopes in excess of 30%. 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%, BLM personnel may request a professional geotechnical analysis prior to construction.
22. Generator Noise. The generator(s) and pump(s) serving the injection well shall be installed and operated at the site in a manner that, at a minimum, meets the Colorado Oil and Gas Conservation Commission's Noise Abatement regulation (No. 802) for Residential/Agricultural/Rural Zone. In summary, this regulation requires that the noise level not exceed 50 db(A) between 7:00 p.m. and 7:00 a.m. at a distance of 350 feet from the noise source.

DOWNHOLE CONDITIONS OF APPROVAL
Applications for Permit to Drill

Company/Operator: Noble Energy, Inc.

Surface Location: NWSW, Section 35, Township 7 South, Range 95 West, 6th P.M.

Well Name	Well No/(Pad).	Bottomhole Location	Lease
Rulison Federal	35-14A (35L)	SWSW, Sec. 35, T7S, R95W	COC60433
Rulison Federal	35-14B (35L)	SWSW, Sec. 35, T7S, R95W	COC60433
Rulison Federal	35-14C (35L)	SWSW, Sec. 35, T7S, R95W	COC60433
Rulison Federal	35-14D (35L)	SWSW, Sec. 35, T7S, R95W	COC60433
Rulison Federal	35-24A (35L)	SESW, Sec. 35, T7S, R95W	COC60433
Rulison Federal	35-24B (35L)	SESW, Sec. 35, T7S, R95W	COC60433
Rulison Federal	35-24C (35L)	SESW, Sec. 35, T7S, R95W	COC60433
Rulison Federal	35-24D (35L)	SESW, Sec. 35, T7S, R95W	COC60433

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 BLM shall be notified. One of the following CRVFO inspectors shall be notified by phone: Julie King, Lead PET, at 970-876-9036; David Giboo at 970-876-9038 or 970-319-2211 (cell); or Alan White at 970-876-9037 or 970-366-2565(cell).
2. A CRVFO petroleum engineer shall be contacted for a verbal approval prior to commencing remedial work, plugging operations on newly drilled boreholes, changes within the drilling plan, sidetracks, changes or variances to the BOPE, deviating from conditions of approval, and conducting other operations not specified within the APD. Contact Will Howell at 970-876-9049 or 970-319-5837(cell) for verbal approvals.
3. If a well control issue arises during drilling or completions operations (e.g. kick, blowout, or water flow, casing failure occurs, or an increase in bradenhead pressure), Will Howell shall be notified at 970-876-9049 or 970-319-5837 (cell) within 24 hours from the time of the event. IADC, Driller's Logs, and Pason Logs (mud logs) shall be forwarded to BLM, Will Howell, 2300 River Frontage Road, Silt, Colorado 81652 within 24 hours of a well control event.
4. The BOPE shall be tested and conform to Onshore Order #2 for a **5M** system.
5. A casinghead rated to 5,000 psi or greater shall be utilized.
6. An electrical/mechanical mud monitoring equipment shall be function tested prior to drilling out the surface casing shoe. As a minimum, this equipment shall include a trip tank, pit volume totalizer, stroke counter, and flow sensor.
7. Prior to drilling out the surface casing shoe, gas detecting equipment shall be installed in the mud return system, and the rate of penetration/mud shall be monitored for hydrocarbon gas/pore pressure changes.
8. A gas buster shall be functional and all flare lines effectively anchored in place, prior to drilling out the surface casing shoe. The discharge of the flare lines shall be a minimum of 100 feet from the well

head and targeted at bends. The panic line shall be a separate line (not open inside the buffer tank) and effectively anchored. All lines shall be downwind of the prevailing wind direction and directed into a flare pit, which cannot be the reserve pit. The flare system shall use an automatic ignition. Where noncombustible gas is likely or expected to be vented, the system shall be provided supplemental fuel for ignition and maintain a continuous flare.

9. A length of 3,300 feet of surface casing will be required on these wells to protect potential water source/aquifers and control loss circulation zones.
10. After the surface casing is cemented, a Pressure Integrity Test/FIT will be performed on the first well drilled in accordance with OOGO No. 2; Sec. III, B.1. i. in order to make sure the surface casing is set in a competent formation. Submit the results from the test via email (whowell@blm.gov) on the first well drilled on the pad and record results in the IADC log.
11. Prior to commencing fracturing operations, the production casing shall be tested to the maximum anticipated surface treating/fracture pressure (Noble 9000 psi) and held for 15 minutes without a 2% leakoff. 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 within 48 hours after Frac operations.
12. As a minimum, cement shall be brought to 200 feet above the Mesaverde. After WOC for the production casing, a CBL shall be run to verify the TOC and an electronic copy submitted to BLM, Will Howell, 2300 River Frontage Road, Silt, CO 81652 within 48 hours. 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 CRVFO petroleum engineer shall be notified for remedial operations.

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

A production casing centralizer program will maintain a 67% stand-off. The centralizer program will have 1 centralizer every other joint through the vertical section and 1 centralizer per joint through the tangent (build/drop) sections of the well.

13. On the first well drilled on this pad, a triple combo open hole log shall be run from the base of the surface borehole to surface, and from TD to bottom of surface casing shoe. This log shall be in submitted within 48 hours to BLM, Will Howell, 2300 River Frontage Road, Silt, CO 81652. Contact Todd Sieber at 970-876-9044 or 970-319-7887 (cell) or anthony_sieber@blm.gov for clarification.
14. Submit the (a) mud/drilling log (e.g. Pason disc), (b) driller's event log/operations summary report, (c) production test volumes, (d) directional survey, and (e) Pressure Integrity Test results within 30 days of completed operations (i.e. landing tubing) per 43 CFR 3160-9. Contact Will Howell for clarification.
15. A casing string integrity test will be run insuring casing mechanical integrity on the surface/ production casing. This casing integrity test will not exceed 70% of the casing burst pressure per OOGO No. 2; Sec III, B. 1. h. The test pressure should not decline more than 10% in 30 minutes or

remedial work will be necessary. Submit the graphical results from the test via email (whowell@blm.gov) or mail to BLM, Will Howell, 2300 River Frontage Road, Silt, Colorado 81652.

16. 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 graphical results from the test via email (whowell@blm.gov) or mail to BLM, Will Howell, 2300 River Frontage Road, Silt, Colorado 81652.