

**United States Department of the Interior
Bureau of Land Management
Royal Gorge Field Office
3028 E. Main Street
Cañon City, CO 81212**

Environmental Assessment

Razor 12 F, G, H APDs

DOI-BLM-CO-F02-2014-010 EA

December, 2013



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CHAPTER 1 - INTRODUCTION

1.1 IDENTIFYING INFORMATION

CASEFILE/PROJECT NUMBER (optional): Lease # COC 75061

PROJECT TITLE: Razor 12 F, G, H Applications for Permits to Drill

PLANNING UNIT: Northeast

LEGAL DESCRIPTION: Weld County, T10N R58W S 12

APPLICANT: Whiting Oil and Gas

1.2 INTRODUCTION AND BACKGROUND

BACKGROUND: This EA has been prepared by the BLM to analyze environmental impacts of the construction of three well pads and the drilling of up to sixteen horizontal oil wells on private surface estates/over private mineral estates (fee/fee). The projects are located on rangeland in Northwest Weld County approximately 17 miles east of the town of Grover, Colorado. The wells will access fee and Federal minerals. The Federal mineral estate that will be accessed by the wells is leased and subject to oil and gas development. All surface activities related to these actions will take place on privately owned surface, there is no public land or public access in the project area.

1.3 PURPOSE AND NEED

The purpose of the action is to provide the applicant the opportunity to develop their leases for the production of oil and gas. The need for the action is to develop oil and gas resources on Federal Lease COC75061 consistent with existing Federal lease rights provided for in the Mineral Leasing Act of 1920, as amended.

1.4 DECISION TO BE MADE

The BLM will decide whether to approve the Razor 12 F, G, and H Applications for Permits to Drill (APDs) project based on the analysis contained in this Environmental Assessment (EA). This EA will analyze the proposed action; to construct three well pads, install production facilities, and drill wells in order to develop federal and private minerals from a private surface (fee/fee/fed). Access to the proposed project would be on existing highway, county and oil field roads. The finding associated with this EA may not constitute the final approval for the proposed action.

1.5 PLAN CONFORMANCE REVIEW

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

Name of Plan: Northeast Resource Area Plan and Record of Decision as amended by the Colorado Oil and Gas Final EIS and Record of Decision (RD)

Date Approved: 09/16/86 amended 12/06/91

Decision Number: O&G Resources, Issue 21

Decision Language: “These 210,410 acres of surface and subsurface may be leased and developed for oil and gas with the standard stipulations included in the leases and standard site-specific stipulations included in any use authorization.”

1.6 SCOPING, PUBLIC INVOLVEMENT AND ISSUES

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

Persons/Public/Agencies Consulted: The federal mineral estate parcels being accessed with this action were scoped and made available for public comment during the leasing process. Scoping for the current action occurred through posting on the BLM NEPA website.

Issues Identified:

No issues were identified during public scoping.

CHAPTER 2 - PROPOSED ACTION AND ALTERNATIVES

2.1 INTRODUCTION

The BLM has already received 8 Application Permits to Drill (APDs), and is anticipating receiving 4 additional APDs proposing the construction of three well pads, and the drilling of 16 horizontal oil wells on private surface over private minerals, developing both private and federal minerals (fee/fee/fed). 8 of the 16 proposed fee/fee/fed wells are to be drilled on the “F” well pad, which will also have 8 totally private (fee surface/100% fee minerals) wells drilled from its surface, regardless of the BLM’s decision pertaining to the fee/fee/fed wells planned for this pad. 4 of the proposed 16 fee/fee/fed wells are planned to be drilled from the “G” pad, which will also contain 4 totally fee wells, regardless of the BLM’s decision pertaining to the Federal wells on this pad. The remaining 4 fee/fee/fed wells will be drilled from the surface of the “H” pad, which already contains one totally fee well, and is planned to have 3 additional fee wells drilled from this pad regardless of the BLM’s decision pertaining to the fee/fee/fed wells planned for

this pad. The “H” pad was already constructed prior to the drilling of the fee well, but will need to be expanded in order to drill the additional wells. Since all surface activity and related disturbance is taking place on private surface, and private minerals are targeted along with federal minerals, BLM has limited authority over the actions that take place on the surface, including authority to impose mitigation measures (as COAs to the approved APD) pertaining to the surface management of the well site. However, BLM will analyze the impacts to applicable resources, including some that BLM has no authority to affect.

The projects are in Weld County, approximately 17 miles east of the Town of Grover. The federal mineral estate is leased and subject to oil and gas development.

The general area description would be defined as rural rangeland located in the northeastern plains of Colorado, used primarily for livestock production and oil and gas development. There are a few county roads in the project area. Access is limited to private or petroleum field roads, over private surface. The roadways vary in development but most are dirt/primitive roads. There is no public land or public roads or other public access in the project area.

Extensive oil and gas development has occurred in the area, mostly on private (fee) surface and private (fee) mineral estate.

2.2 ALTERNATIVES ANALYZED IN DETAIL

2.2.1 Proposed Action

The proposed action is to construct three well pads and drill 16 horizontal wells in order to develop private and federal minerals, from a private surface over private minerals.

Access to the proposed projects would be gained by traveling on existing highways, county and oil field roads. There will be no new road construction. The individual well pads will have production facilities located on them if the wells are economic.

Since all of the proposed pads have entirely fee (private) wells planned for their surface, and the pads are located on fee surface over fee mineral estate, the pads may be constructed and totally fee (private) wells drilled before the approval of the BLM APDs for the fee/fee/federal wells that are planned for these locations.

Proposed Pad Details:

Razor 12 “F” Pad:

The proposed Razor 12 “F” pad would have a maximum cut of 12.9 feet and a maximum fill of 9.6 feet resulting in 31,300 cu yards of excess material, plus 7,850 cu yards of topsoil which will be stripped from the top 6” of the surface and stockpiled before construction, for use during interim reclamation. Construction of the well pad would result in approximately 11.8 acres of new surface disturbance, which would be reduced to approximately 3.5 acres after successful interim reclamation.

Razor 12 “G” Pad:

The proposed Razor 12 “G” pad would have a maximum cut of 26 feet and a maximum fill of 6 feet resulting in 49,950 cubic yards of material, plus 7,250 cu yards of topsoil which will be stripped from the top 6” of the surface and stockpiled before construction, for use during interim reclamation. Construction of the well pad would result in approximately 12.2 acres of new surface disturbance, which would be reduced to approximately 3.5 acres after successful interim reclamation.

Razor 12 “H” Pad:

The Razor 12 “H” pad was already constructed prior to the drilling of the existing fee well recently drilled from it’s surface, and has not yet been interim reclaimed. In order to drill the additional planned wells on this pad, it will be expanded from approximately 4.5 acres to approximately 12.9 acres for the drilling phase. Existing topsoil and spoils piles will be moved, and combined with new topsoil and spoils. The topsoil will be segregated for use during interim reclamation. Expanding the pad would require a maximum cut of 21.6 feet and a maximum fill of 7 feet resulting in 59,900 cu yards of excess spoils material. 3,980 cu yards of topsoil will be stripped and added to the existing topsoil pile, which was segregated from the initial pad construction. The pad size will be reduced to approximately 3.5 acres after successful interim reclamation.

The proposed drilling and completion of all wells will utilize closed loop systems. All liquids will be stored in tanks within on the pad. No pits will be utilized. Drill cuttings will be bio-remediated onsite, and after it meets the standards of Colorado Table 910-1, will be spread thin over wellsite before interim reclamation. All other waste materials produced during drilling, completion and operation of the well (completion fluids, produced water, sewage and garbage) will be hauled off site and recycled or disposed of at applicable state permitted commercial treatment/disposal facilities. The duration drilling is estimated to total 60 days.

If the initial wells on the Razor 12 pad(s) are good producers, the operator may delay interim reclamation on the pad(s) in order to drill additional wells on this pad, which would take place after the proper permits (BLM, COGCC ect.) are obtained for these wells by the operator. Stormwater/ erosion control measures will be taken to stabilize site. Interim reclamation would then take place within 6 months of completion of final well on the pad(s).

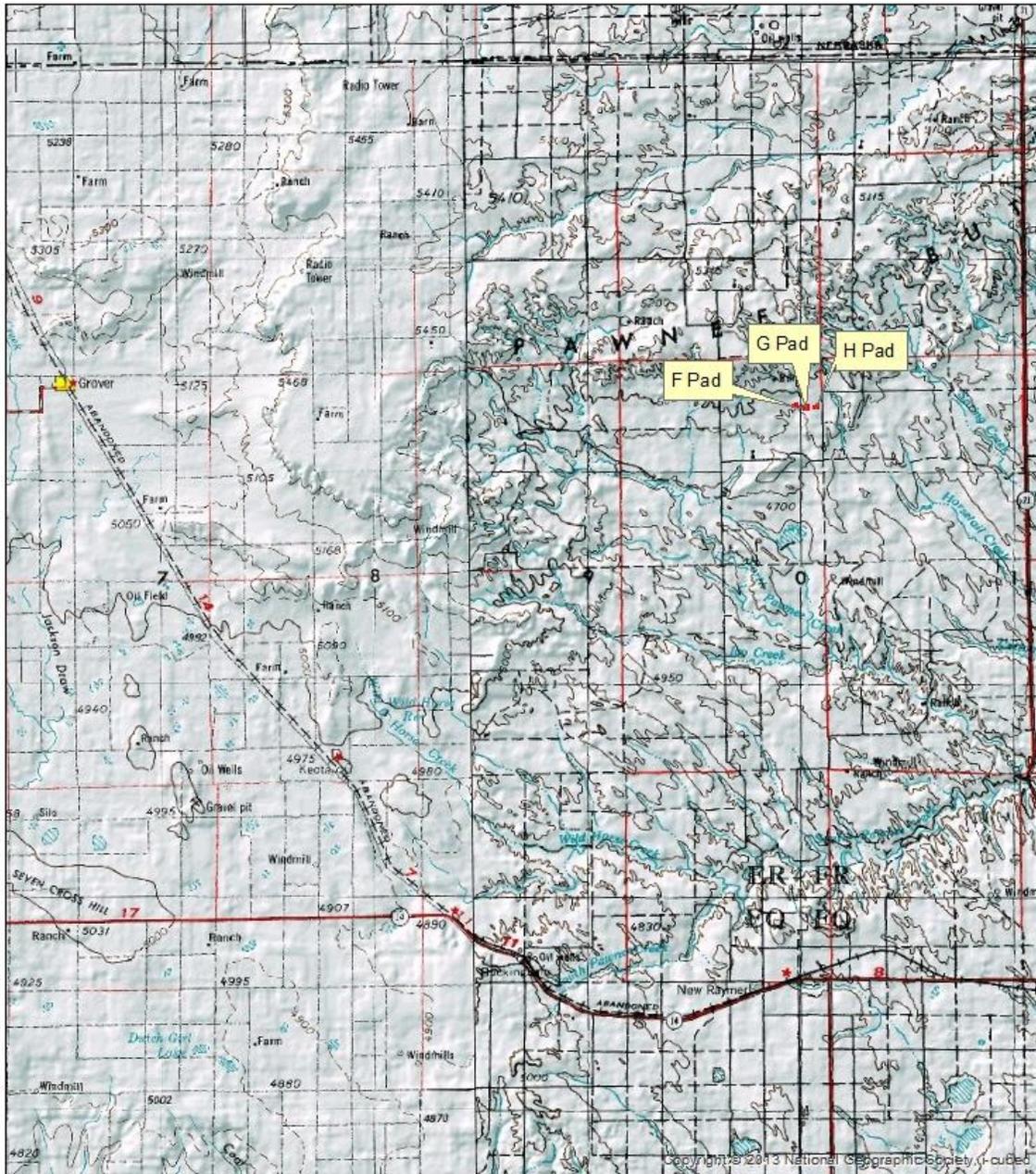
Interim reclamation of each pad will begin within 6 months (weather permitting) of completion of final well. Interim reclamation will consist of redistribution of excess soil, re-contouring the areas of the pad not needed for production as close to original as possible. All areas not needed for transportation of produced liquids and routine maintenance would be re-vegetated in accordance with the reclamation section of the multi-point surface operations plan.

Final reclamation of each project will begin within 6 months (weather permitting) of final well plugging, or in the event of a dry hole. Final reclamation will be completed in accordance with the reclamation section of the multi-point surface operations plan, which consists of proper

plugging of wells, removal of all facilities and related equipment from the surface of the site (if left in place, abandoned pipelines will be flushed, cut below ground level, and capped), and removal of any surfacing materials on road or pad. Top soil will be stripped and segregated so it can be spread evenly over the entire area. Pad and road areas will be ripped, re-contoured to their original form and top soil will be evenly spread over the surface. The area will be drill or broadcast seeded, and if necessary covered with weed free mulch. Area will be monitored for presence of weeds, which will be controlled if present. If initial seeding is not successful, the operator must re-seed the area until desirable vegetation is established. The bond will not be released until BLM has determined that successful reclamation has been achieved.

The Application for Permit to Drill (APD) for each new well includes a detailed and specific drilling program and multi-point surface operations plan (including detailed construction and reclamation plans.) The proposed action would be implemented consistent with the operations plans provided with approved permit, with Conditions Of Approval (COAs), Onshore Oil and Gas Orders, the applicable terms of Federal Lease COC63737, Onshore Oil and Gas Orders, and 43 CFR §3100.

Overview Map



OVERVIEW MAP OF RAZOR 12 F, G, H, APDs

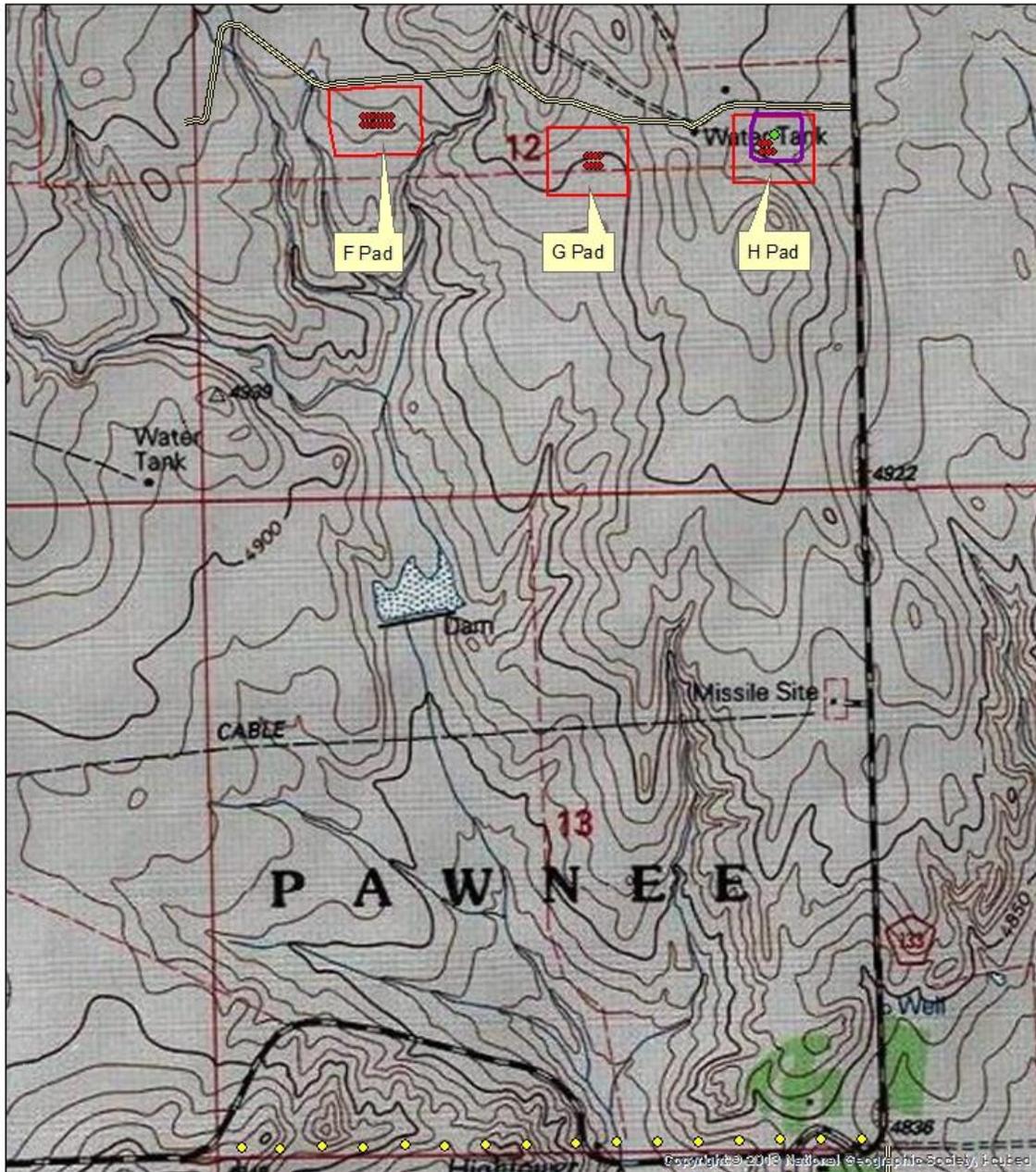
DOI-BLM-CO-F02-2014-010 EA

6th PM, T10N R58W



NOTE TO MAP USERS
No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of the data layers shown on this map. The official land records of the data providers should be checked or current status on any specific tract of land.

Topographic Project Map



PROJECT MAP OF RAZOR 12 F, G, H, APDs

- ◆ SHL Proposed Well (Private and Fed)
- ◆ BHL Proposed Well (Fed)
- ◆ SHL Existing Fee Well
- ▭ Proposed Pad
- ▭ Existing Pad
- ══ Existing Road

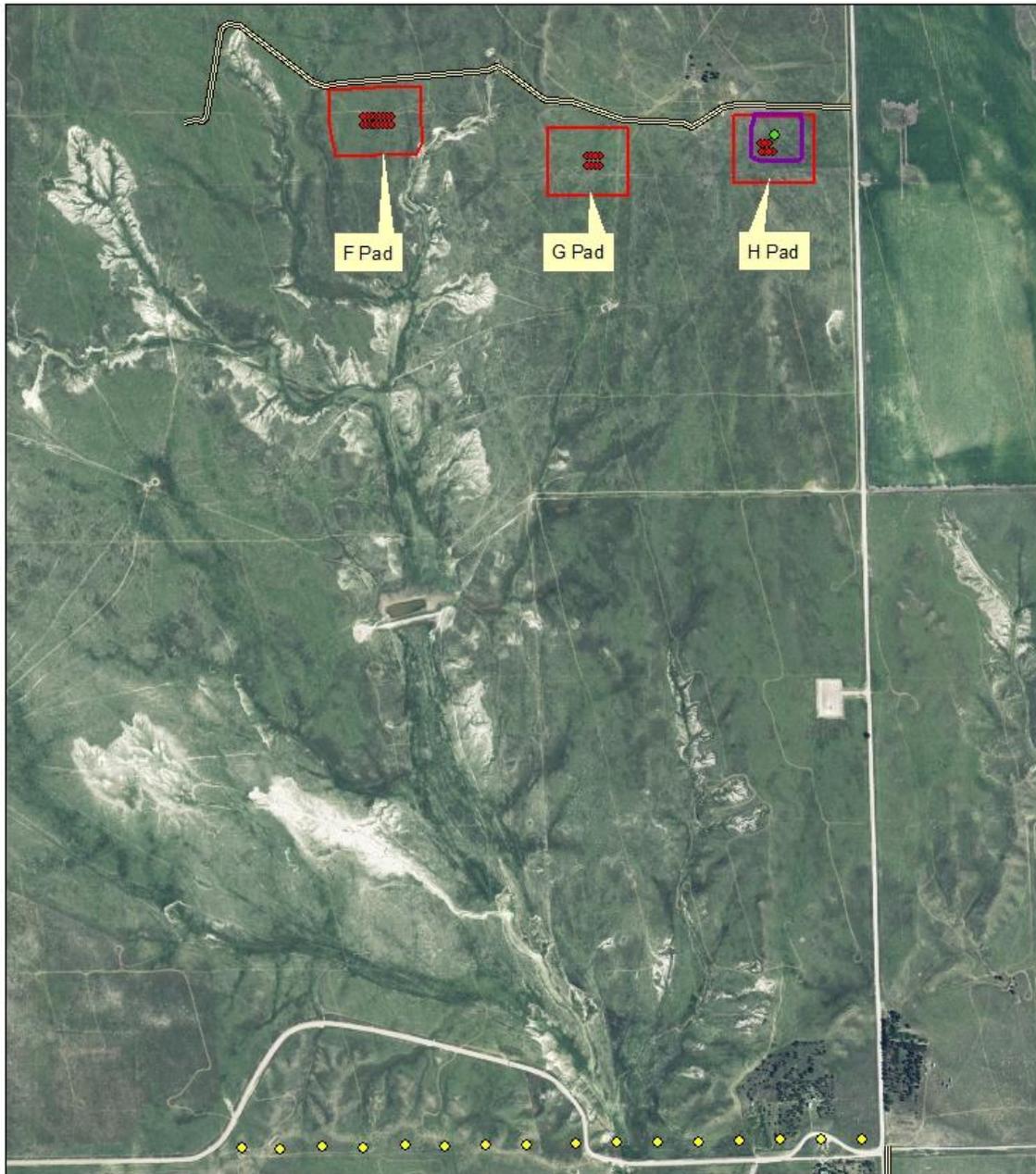
DOI-BLM-CO-F02-2014-010 EA

6th PM, T10N R58W



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Aerial Photo of Project



NAIP OF RAZOR 12 F, G, H, APDs

- ◆ SHL Proposed Well (Private and Fed)
 - ◆ BHL Proposed Well (Fed)
 - ◆ SHL Existing Fee Well
 - ▭ Proposed Pad
 - ▭ Existing Pad
 - ══ Existing Road
- DOI-BLM-CO-F02-2014-010 EA
6th PM, T10N R58W
- 0 0.05 0.1 0.2 0.3 0.4 Miles



NOTE TO MAP USERS
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2.2.2 No Action Alternative

The proposed action involves Federal subsurface minerals that are encumbered with Federal oil and gas leases, which grant the lessee a right to explore and develop the leases. Although BLM cannot deny the right to drill and develop the leasehold, individual APDs can be denied to prevent unnecessary and undue degradation. The no action alternative constitutes denial of the APDs associated with the proposed action. Under the no action alternative, therefore, none of the proposed developments described in the proposed action would take place.

2.3 ALTERNATIVES CONSIDERED BUT NOT ANALYZED IN DETAIL

Other alternatives were not considered due to the proposed project being a non-discretionary action being proposed on private surface.

CHAPTER 3 - AFFECTED ENVIRONMENT AND EFFECTS

3.1 INTRODUCTION

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

3.1.1 Interdisciplinary Team Review

The following table is provided as a mechanism for resource staff review, to identify those resource values with issues or potential impacts from the proposed action and/or alternatives. Those resources identified in the table as potentially impacted will be brought forward for analysis.

<u>Resource</u>	<u>Initial and date</u>	<u>Comment or Reason for Dismissal from Analysis</u>
<u>Air Quality</u> <i>Ty Webb, Chad Meister, Melissa Hovey</i>	FC, 1/14/14	See affected environment
<u>Geology/Minerals</u> <i>Stephanie Carter, Melissa Smeins</i>	MJS, 09/06/2013	See affected environment
<u>Soils</u> <i>John Smeins</i>	JS, 12/26/13	All infrastructure (roads, drill pads, etc.) being proposed, would be built and reclaimed according to BLM Gold Book standards unless otherwise stipulated by the surface owner. See more in Soils section.
<u>Water Quality</u> <u>Surface and Ground</u> <i>John Smeins</i>	JS, 12/26/13	See Water Quality section.

<u>Resource</u>	<u>Initial and date</u>	<u>Comment or Reason for Dismissal from Analysis</u>
<u>Invasive Plants</u> <i>John Lamman</i>	JL, 12/26/2013	See affected environment.
<u>T&E and Sensitive Species</u> <i>Matt Rustand</i>	MR, 12/16/2013	No T&E species or habitats are located within the action area. BLM sensitive species ferruginous hawk, mountain plover, black-tailed prairie dog, burrowing owl, swift fox, and milk snake may be found in this habitat type. See affected environment.
<u>Vegetation</u> <i>Jeff Williams, Chris Cloninger, John Lamman</i>	JL, 12/26/2013	See affected environment
<u>Wetlands and Riparian</u> <i>Dave Gilbert</i>	DG, 12/18/13	The Proposed Action is within upland rangelands.
<u>Wildlife Aquatic</u> <i>Dave Gilbert</i>	DG, 12/18/13	The Proposed Action is within upland rangelands.
<u>Wildlife Terrestrial</u> <i>Matt Rustand</i>	MR, 12/16/2013	See affected environment
<u>Migratory Birds</u> <i>Matt Rustand</i>	MR, 12/16/2013	See affected environment.
<u>Cultural Resources</u> <i>Monica Weimer</i>	MMW, 1/21/14	No concerns. See Reports CR-RG-14-83 N, CR-RG-14-84 N and CR-RG-14-85 N.
<u>Native American Religious Concerns</u> <i>Monica Weimer</i>	MMW, 1/21/14	No concerns, per Tribal Consultation CR-RG-14-334 NA.
<u>Economics</u> <i>Aaron Richter</i>	AR, 1/14/14	See affected environment
<u>Geologic and Mineral Resources</u> <i>Melissa Smeins, Stephanie Carter</i>	MJS, 12/04/2013	See affected environment
<u>Paleontology</u> <i>Melissa Smeins, Stephanie Carter</i>	MJS, 12/04/2013	See affected environment
<u>Visual Resources</u> <i>Kalem Lenard</i>	KL, 12/6/2013	The project is within a highly modified environment with existing structures and wells and would not impact visual resources.
<u>Environmental Justice</u> <i>Martin Weimer</i>	mw, 3/26/14	The proposed action affects areas that are rural in nature. The land adjacent to the well site is grassland, as a result, there are no minority or low-income populations in or near the project area. As such, the proposal will not have a disproportionately high or adverse environmental effect on minority or low-income populations.
<u>Wastes Hazardous or Solid</u> <i>Stephanie Carter</i>	MJS, 12/04/2013	See affected environment

<u>Resource</u>	<u>Initial and date</u>	<u>Comment or Reason for Dismissal from Analysis</u>
<u>Recreation</u> <i>Kalem Lenard</i>	KL, 12/06/2013	Not Present
<u>Farmlands Prime and Unique</u> <i>Jeff Williams, Chris Cloninger, John Lamman</i>	JL, 12/26/2013	Not Present
<u>Lands and Realty</u>		N/A
<u>Wilderness, WSAs, ACECs, Wild & Scenic Rivers</u> <i>Kalem Lenard</i>	KL, 12/06/2013	Not Present
<u>Wilderness Characteristics</u> <i>Kalem Lenard</i>	KL, 12/06/2013	Not Present
<u>Range Management</u> <i>Jeff Williams, Chris Cloninger, John Lamman</i>	JL, 12/26/2013	Surface estate is private
<u>Forest Management</u> <i>Ken Reed</i>	KR, 12/9/13	Not Present
<u>Cadastral Survey</u> <i>Jeff Covington</i>	JC, 12/6/13	COS is attached in the project folder.
<u>Noise</u> <i>Martin Weimer</i>	mw, 3/26/14	The project area is located in grassland. Certain levels of noise are associated with drilling operations, these include drill rig operation, compressors/generators and general machine and vehicle operation. These impacts are temporary and terminate when drilling operations are complete.
<u>Fire</u>		N/A
<u>Law Enforcement</u> <i>Steve Cunningham</i>		N/A

The affected resources brought forward for analysis include:

- Air quality
- Geology/Minerals
- Water Quality
- Soils
- Invasive Plants
- Vegetation
- Wildlife Terrestrial

- Migratory Birds
- Paleontology
- Wastes Hazardous or Solid

3.2 PHYSICAL RESOURCES

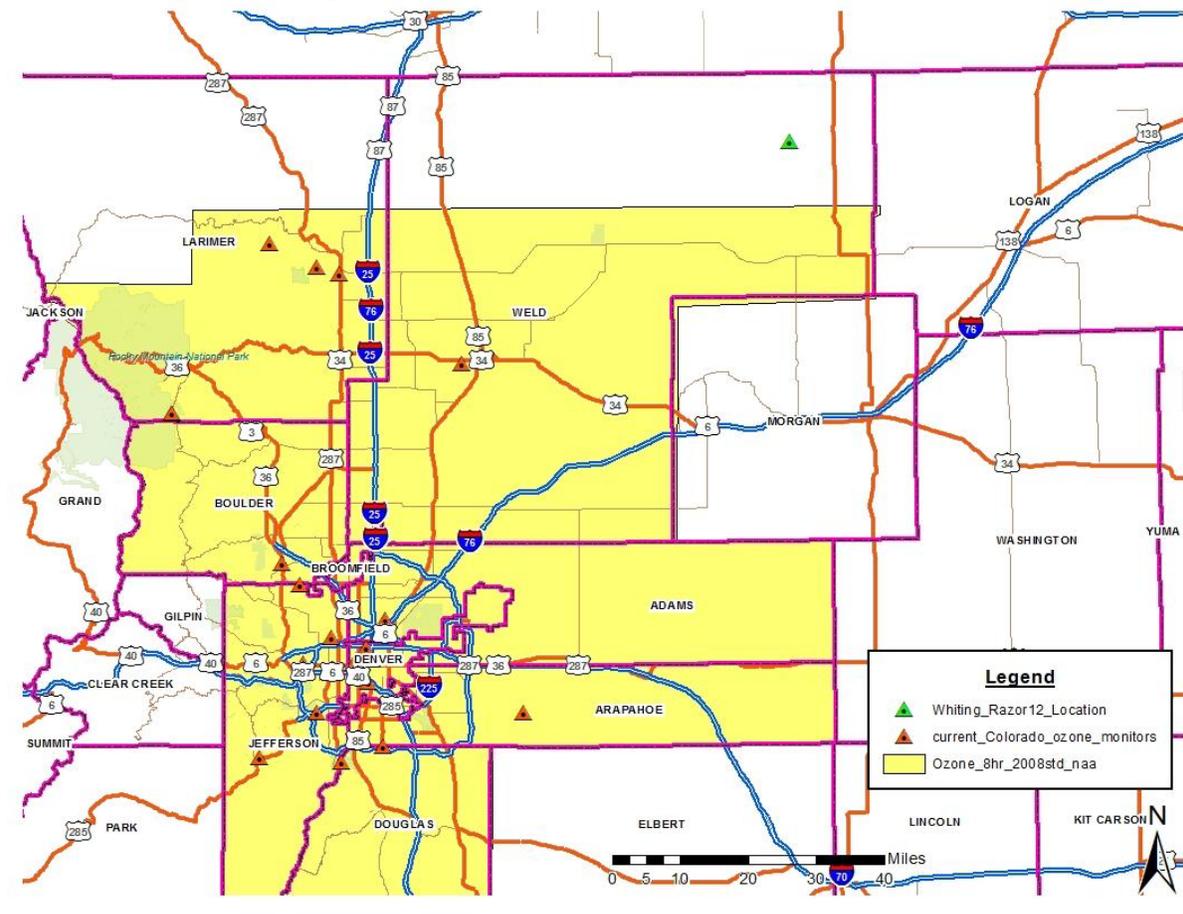
3.2.1 AIR QUALITY AND CLIMATE

Affected Environment: The proposed action area (Northeastern Weld County) is predominantly used for agriculture. Approximately 75% of the available land area of Weld County is linked to the agricultural sector of the economy in one form or another. Oil and gas development is another major economic driver for the area, and Weld County has some 25,000 active wells within its boundaries.

The population density of Weld County is generally dispersed within the proposed action area, and is generally less than 10 people per square mile. Mean temperatures in the area range from 15.6 degrees F in January to 88.7 degrees F in July. The area receives average annual precipitation of approximately 14.22 inches. Frequent winds in the area provide excellent dispersion characteristics for distributing anthropogenic emissions.

Activities occurring within the area that affect air quality include exhaust emission from cars, drilling rigs, other vehicles, and oil and gas development activities, as well as fugitive dust from roads, agriculture, and energy development.

Figure 3-1. Project Location and Boundaries



Regulatory Framework: The Clean Air Act (CAA), which was last amended in 1990, requires the Environmental Protection Agency (EPA) to set National Ambient Air Quality Standards (NAAQS) (40 CFR part 50) for criteria pollutants. Criteria pollutants are air contaminants that are commonly emitted from the majority of emissions sources and include carbon monoxide (CO), lead (Pb), sulfur dioxide (SO₂), particulate matter smaller than 10 & 2.5 microns (PM₁₀ & PM_{2.5}), ozone (O₃), and nitrogen dioxide (NO₂).

The CAA established 2 types of NAAQS:

Primary standards: – Primary standards set limits in order to protect public health, including the health of "sensitive" populations (such as asthmatics, children, and the elderly).

Secondary standards: – Secondary standards set limits in order to protect public welfare, including protection against decreased visibility, and damage to animals, crops, vegetation, and buildings.

The EPA regularly reviews the NAAQS (every five years) to ensure that the latest science on health effects, risk assessment, and observable data such as incidence rates are evaluated in order to re-propose any NAAQS to a lower limit if the data supports the finding. The Colorado Air

Pollution Control Commission, by means of an approved State Implementation Plan (SIP) and/or delegation by EPA, can established state ambient air quality standards for any criteria pollutant that is at least as stringent as, or more so, than the federal standards. Ambient air quality standards must not be exceeded in areas where the general public has access. Table 3.1 lists the federal and state ambient air quality standards.

Table 3-1. Ambient Air Quality Standards (EPA 2014)

Pollutant [final rule cite]		Primary/ Secondary	Averaging Time	Level	Form
Carbon Monoxide [76 FR 54294, Aug 31, 2011]		primary	8-hour	9 ppm	Not to be exceeded more than once per year
			1-hour	35 ppm	
Lead [73 FR 66964, Nov 12, 2008]		primary and secondary	Rolling 3 month average	0.15 µg/m ³	Not to be exceeded
Nitrogen Dioxide [75 FR 6474, Feb 9, 2010] [61 FR 52852, Oct 8, 1996]		primary	1-hour	100 ppb	98th percentile, averaged over 3 years
		primary and secondary	Annual	53 ppb	Annual Mean
Ozone [73 FR 16436, Mar 27, 2008]		primary and secondary	8-hour	0.075 ppm	Annual fourth-highest daily maximum 8-hr concentration, averaged over 3 years
Particle Pollution [Dec 14, 2012]	PM _{2.5}	primary	Annual	12 µg/m ³	Annual mean, averaged over 3 years
		secondary	Annual	15 µg/m ³	Annual mean, averaged over 3 years
		primary and secondary	24-hour	35 µg/m ³	98th percentile, averaged over 3 years
	PM ₁₀	primary and secondary	24-hour	150 µg/m ³	Not to be exceeded more than once per year on average over 3 years
Sulfur Dioxide [75 FR 35520, Jun 22, 2010] [38 FR 25678, Sept 14,		primary	1-hour	75 ppb	99th percentile of 1-hour daily maximum concentrations, averaged over 3

1973]				years
	secondary	3-hour	0.5 ppm	Not to be exceeded more than once per year

The nearest APCD air monitors to the project sites are the Weld County West Annex (CO), County Tower (O₃), and Hospital (PM₁₀ & PM_{2.5}) sites located in Greeley, and the Platteville Middle School site (PM_{2.5}).

Table 3-2. Ambient Air Quality Monitoring Data Trends (CDPHE 2007 – 2010, EPA Forms)

Monitor	Pollutant (Standard)	2007	2008	2009	2010
West Annex	CO (1 Hour - ppm)	4.0	5.0	4.3	2.3
	CO (8 Hour - ppm)	2.5	2.3	2.3	1.8
County Tower	O ₃ (8 Hour - ppm)	0.078	0.076	0.075	0.074
Hospital	PM ₁₀ (24 Hour - μg/m ³)	89	68	63.0	44.0
	PM _{2.5} (24 Hour - μg/m ³)	24.0	25.2	24.7	22.0
	PM _{2.5} (Annual - μg/m ³)	9.5	7.67	8.36	7.6
Platteville	PM _{2.5} (24 Hour - μg/m ³)	24.0	25.2	25.7	21.1
	PM _{2.5} (Annual - μg/m ³)	10.3	8.23	8.24	7.8

Table 3-3. Additional Ambient Background Concentrations

Pollutant / Units	Non-Particulate Matter Background Monitored Concentrations (Year 2012)			Monitoring Station Information
	1-Hour	1-Hour	1-Hour	
NO ₂ (□g/m ³)	9.97 ^a	67.37 ^b	120.44 ^c	a.Rio Blanco County 98 th percentile NO ₂ 1-hour. b.Cheyenne, Wyoming 98 th percentile NO ₂ 1-hour. c.North Denver, Colorado 98 th percentile

Pollutant / Units	Particulate Matter Background Monitored Concentrations (Year 2012)			Monitoring Station Information
	24-Hour	24-Hour	24-Hour	
PM ₁₀ (□g/m ³)	91 ^a	87 ^b	86 ^c	a.Greeley, Colorado 2 nd maximum 24-hour average PM ₁₀ concentration. b.Denver, Colorado 2 nd maximum 24-hour average PM ₁₀ concentration. c.North Denver, Colorado 2 nd
PM _{2.5} (□g/m ³)	19 ^a	28 ^b	17 ^c	a.Denver, Colorado 98 th percentile 24-hour average PM _{2.5} concentration. b.Longmont, Colorado 98 th percentile 24-hour average PM _{2.5} concentration. c.Boulder, Colorado 98 th

µg/m³ = micrograms per cubic meter

NO₂ = nitrogen dioxide

PM₁₀ / PM_{2.5} = particulate matter less than or equal to 10 microns / 2.5 microns in size

The USEPA has recently established a final rule of new source performance standards (NSPS) and emissions regulations for oil and gas facilities. The following Table 3-4 provides a summary of the NSPS OOOO oil and gas requirements.

Table 3-4. Summary of USEPA NSPS Oil and Gas Requirements

Source Affected by USEPA NSPS Requirements	Criteria Pollutants					GHG Pollutants			HAPs	
Natural Gas						VOC		CH ₄		HAPs

Source Affected by USEPA NSPS Requirements	Criteria Pollutants					GHG Pollutants		HAPs		
Well Completion	NSPS Requirements for New Hydraulically Fractured Wells (2-Phased Approach): First phase (before Jan.1, 2015), industry must reduce emissions either by flaring using a completion combustion device or by capturing the gas using green completions. Second phase (beginning Jan. 1, 2015), operators must capture the gas and make it available for use or sale. Exceptions to the final rule apply for new exploratory wells, oil wells, low-pressure wells, and where combustion is a safety hazard or is prohibited by state or local regulations.									
Natural Gas Well Re-Completion						VOC		CH ₄		HAPs
	NSPS Requirements for Refractured Natural Gas Wells: Owners/operators of refractured gas wells may choose to reduce emissions through flaring until January 1, 2015, when the must use green completions.									
Pneumatic Controllers						VOC		CH ₄		HAPs
	NSPS Requirements for New and Modified Controllers: The final rule affects high-bleed, gas-driven controllers (with a gas bleed rate greater than 6 SCFH) that are located between the wellhead and the point where gas enters the transmissions pipeline. At the wellsite (also applies to oil well sites) and at gas gathering and boosting stations, the gas bleed limit is 6 CFH at an individual controller. Phase in over one year and exceptions apply for safety hazards and for applications that require high-bleed controllers. For gas processing plants, the VOC emissions limit is zero for continuous bleed, gas driven controllers.									
Storage						VOC		CH ₄		HAPs

Source Affected by USEPA NSPS Requirements	Criteria Pollutants					GHG Pollutants			HAPs	
Tanks	NSPS Requirements for Storage Vessels at the Well Site (also applies to oil well sites) and Gas Gathering and Boosting Stations and Natural Gas Processing Plants and Compressor Stations: New storage tanks with VOC emissions or 6 tons per year or more must reduce total VOC emissions by at least 95 percent. The final rule provides a one-year phase-in for this requirement.									
Glycol Dehydrators						VOC		CH ₄		HAPs
	Air Toxic Requirements for Glycol Dehydrators at the Well Site and Gas Gathering & Boosting Stations and Natural Gas Processing Plants and Natural Gas Compressor Stations: Large dehydrators – operators may reduce benzene emissions from large dehydrators to less than 1 ton per year as an alternative to reducing total air toxics emissions by 95 percent. Small dehydrators -Both existing and new small glycol dehydrators must meet a unit-specific limit for emissions of BTEX (benzene, toluene, ethylbenzene and xylene) that is based on the unit’s natural gas throughput and gas composition. The limit is determined by applying a formula set out in the final rule. New small dehys must comply within 60 days and existing dehys must comply within 3 years. This rule only applies to major sources of air toxics.									
Compressors						VOC		CH ₄		HAPs
	NSPS Requirements for New and Modified at Gas Gathering and Boosting Stations and Gas Processing Plants: Centrifugal compressors – the final rule requires a 95 percent reduction in VOC emissions from compressor with wet seal systems, controlling the gas that gets absorbed in the wet seals oil. Reciprocating compressors – final rule requires the replacement of rod packing systems, and replacement is required every 26,000 hours of operation or every 36 months or 6 tons per year or more must reduce total VOC emissions by at least 95 percent. The final rule provides a one-year phase-in for this requirement.									

Source Affected by USEPA NSPS Requirements	Criteria Pollutants					GHG Pollutants			HAPs
	Sweetening Units					SO ₂			
NSPS SO ₂ Requirement for New and Modified Sweetening Units: The final rule requires sweetening units at natural gas processing plants to reduce SO ₂ emissions by 99.9 percent. This requirement applies to units with a sulfur production rate of at least 5 long tons per year.									
Leak Detection and Repair						VOC		CH ₄	HAPs
	The final rule states that the compliance date for new sources for leak detection and repair requirements is 60 days after the final rule is published and existing sources covered by the air toxics rule have an additional year to comply.								

The CAA and the Federal Land Policy and Management Act of 1976 (FLPMA) require BLM and other federal agencies to ensure actions taken by the agency comply with federal, state, tribal, and local air quality standards and regulations. FLPMA further directs the Secretary of the Interior to take any action necessary to prevent unnecessary or undue degradation of the lands [Section 302 (b)], and to manage the public lands “in a manner that will protect the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource, and archeological values” [Section 102 (a)(8)].

The subject activity construction phase is projected to last approximately 60 days. The life of the well, if economically viable, would be expected to sustain operations for approximately 20 – 30 years once production begins. Maximum foreseeable direct and indirect emissions would occur at the beginning of the project during the construction phase when production is also occurring.

The lease area is designated as a Class II Area, as defined by the Federal Prevention of Significant Deterioration (PSD) provision of the CAA. The PSD Class II designation allows for moderate growth or degradation of air quality within certain limits above baseline air quality. The closest Class I area to the proposed well site locations is Rocky Mountain National Park, which lies approximately 90 miles to the west.

Environmental Effects - Proposed Action

Direct and Indirect Impacts: In general the proposed action will have a temporary negative impact to air quality which will mostly occur during the construction phase. Utilization of the access road, surface disturbance, and construction activities such as drilling, hydraulic fracturing,

well completion, and equipment installation will all impact air quality through the generation of dust related to travel, transport, and general construction. This phase will also produce short term emissions of criteria, hazardous, and greenhouse gas pollutants from vehicle and construction equipment exhausts. Once construction is complete the daily activities at the site will be reduced to operational and maintenance checks which may be as frequent as a daily visit. Emissions will result from vehicle exhausts from the maintenance and process technician visits. The pad can be expected to produce fugitive emissions of well gas, which contains mostly methane and a minor fraction of volatile organic compounds. Fugitive emissions may also result from pressure relief valves and working and breathing losses from any tanks located at the site, as well as any flanges, seals, valves, or other infrastructure connections used at the site. Liquid product load-out operations will also generate fugitive emissions of VOCs and vehicular emissions. If the operator is unable to sell any produced gas from the well, then gas flaring will also produce emissions of criteria, HAP, and GHG emissions.

Ozone is not directly emitted like other criteria pollutants. Ozone is chemically formed in the atmosphere via interactions of oxides of nitrogen (NO_x) and volatile organic compounds (VOCs) in the presence of sunlight and under certain meteorological conditions (NO_x and VOCs are ozone precursors). Ozone formation and prediction is complex, generally results from a combination of significant quantities of VOCs and NO_x emissions from various sources within a region, and has the potential to be transported across long ranges. Therefore, it is typically not appropriate to assess (i.e. model) potential ozone impacts of a minor project on potential regional ozone formation and transport. However, the State of Colorado assesses potential ozone impacts from its authorizing activities on a regional basis when an adequate amount of data is available and where such analysis has been deemed appropriate. For this reason (inappropriate scale of analysis), ozone will not be further addressed in this document beyond the related precursor discussions and an appropriate qualitative analysis/comparison to background Weld County emissions inventories.

Emission estimates from the proposed well sites were calculated for this EA, and are disclosed in Table 3.5 below. The emissions inventories (EI) considered reasonably foreseeable oil and gas development activities for the proposed wells, and includes emissions from both construction and production operations. The following pollutants were inventoried where an appropriate basis, methodology, and sufficient data exists: CO, NO_x (includes NO₂), PM_{2.5}, PM₁₀, SO₂, VOCs, HAPs, CO₂, CH₄, and N₂O. The EI was developed using reasonable but conservative scenarios for each activity. Production emissions were calculated based on full production activity for an entire year. Potential emissions were calculated for each new project well assuming the minimum/basic legally required emissions control measures, and common practices and equipment configurations data that was provided by oil and gas operators in the region.

The following assumptions were applied consistently to all potential activities:

- The EI used a disturbed surface area of ~ 12.2 acres on per well pad basis (includes pad, road and gather system infrastructure).

- All disturbed surfaces (pads and access roads) would receive appropriate application of water during construction phase and emissions calculations assume 50% dust control efficiency.
- All diesel fuel would be standard #2 grade (500 ppm sulfur) or better.
- Production phase equipment would include storage tanks, pneumatics, separation equipment, artificial lift and well head compressor engines, and dehydration units. Storage tanks emissions calculations assume 95% VOC control efficiency. Emissions calculations for pneumatic devices assume low-bleed rate devices. Dehydrator emissions are calculated using average emissions factors for controlled and non-controlled units.
- Natural gas would be piped directly into a 3rd party gathering system. Completion flaring would be limited due to the implementation of green completions.
- Drill rigs, completion and fracing engines emissions are based on EPA Non-road Tier 2 emissions standards.
- Compressor engines emission estimates are based on CDPHE Regulation 7 emissions factors for engines > 100 hp and < 500 hp relocated or constructed after 01/01/2011. Wellhead pump-jack engines emissions calculations are based on EPA Non-road Tier 4 emissions standards for engines < 50hp and >= 25 hp.
- The EI uses a DJ Basin representative natural gas analysis to estimate VOC and HAP speciation percentages.
- Fugitive well emissions are based on northern Colorado oil and gas operator provided well component counts.
- No New Source Review (minor) credit was taken (i.e. all emissions estimates are included in the analysis) for project stationary sources likely to receive permitting from APCD. Project related mobile source traffic emissions are also included in the analysis.

Table 3-5 emissions (fed and non-fed) account for full year of production associated with 16 new oil wells and also includes construction phase activities emissions for 16 additional new wells.

Figure 3-2 following Table 3-5 shows a zoomed in look at the project location and includes locations of nearby active wells and shows wells that were drilled year 2008 through 2012. The figure also shows BLM oil and gas leases.

Table 3-5. Estimated Maximum Annual Emissions

Activity	Annual Emissions (tons)												
	PM ₁₀	PM _{2.5}	NO _x	SO ₂	CO	VOC	HAPs	H ₂ S	CO ₂	CH ₄	N ₂ O	CO _{2eq}	CO _{2eq} metric tonnes
Well Pad Construction - Fugitive Dust	1.66	0.17	---	---	---	---	---	---	---	---	---	---	---
Heavy Equipment Exhaust Emissions	2.43	2.36	82.22	3.32	21.59	4.11	0.41	---	10,821.00	0.61	0.27	10,918.70	9,908.08
Commuting Vehicles - Construction	6.85	1.28	10.57	0.04	3.06	0.53	0.05	---	87.99	0.00	0.00	88.04	79.89
Wind Erosion	0.90	0.13	---	---	---	---	---	---	---	---	---	---	---
Completion Venting (100% Green)	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sub-total: Construction	11.83	3.94	92.79	3.36	24.65	4.64	0.46	0.00	10,908.99	0.61	0.27	11,006.74	9,987.97
Well Workover Operations - Fugitive Dust	0.02	0.00	---	---	---	---	---	---	---	---	---	---	---
Well Workover Operations - Exhaust	0.00	0.00	0.06	0.00	0.02	0.00	0.00	---	11.68	0.00	0.00	11.77	10.68
Wellpad Visits for Inspection & Repair	0.09	0.01	0.01	0.00	0.08	0.00	0.00	---	5.36	0.00	0.00	5.40	4.90
Wellhead and Compressor Equipment Leaks	---	---	---	---	---	10.16	1.09	0.00	120.44	157.21	0.00	3,421.75	3,105.04
Wellhead Compressor Engines Exhaust	0.15	0.15	3.86	0.01	7.72	2.70	0.27	---	521.18	0.01	0.00	521.69	473.40
Oil Wellhead Pumps (Artificial Lift)	1.53	1.53	24.33	0.02	28.50	0.97	0.10	---	4,095.62	0.04	0.04	4,109.60	3,729.22
Oil Tanks	---	---	---	---	---	286.91	17.95	---	41.98	0.17	0.00	45.46	41.25
Oil Related Traffic	0.33	0.14	1.84	0.01	0.44	0.07	0.01	---	243.28	0.00	0.00	243.40	220.87
Water Tanks	---	---	---	---	---	1.94	0.21	---	0.00	4.63	0.00	97.31	88.30
Water Related Traffic	0.19	0.08	1.15	0.00	0.27	0.05	0.00	---	151.41	0.00	0.00	151.48	137.46
Water Disposal Pumps	0.00	0.00	0.09	0.00	0.03	0.00	0.00	---	11.90	0.00	0.00	11.91	10.81
Well Pad Heaters	0.00	0.00	0.05	0.00	0.04	0.00	0.00	---	59.73	0.00	0.00	60.09	54.53
Blowdown Venting	---	---	---	---	---	40.73	4.07	0.00	36.59	45.17	0.00	985.15	893.97
Gas Flaring	---	---	0.07	---	0.40	0.15	---	---	98.72	0.69	---	113.18	102.70
Gas Plant Emissions	0.19	0.18	5.82	0.06	3.11	1.21	0.01	0.00	6,862.65	0.13	0.01	6,869.38	6,233.56
Field Dehydrators	---	---	0.01	---	0.03	0.41	0.34	---	29,979.12	0.57	0.55	30,161.56	27,369.84
Sub-total: Operations	2.32	1.92	31.49	0.04	37.54	344.11	24.04	0.00	35,377.01	208.50	0.59	39,939.75	36,242.97
Resource Road Maintenance	0.16	0.02	0.08	0.00	0.03	0.01	0.00	---	9.45	0.00	0.00	9.53	8.65
Sub-total: Maintenance	0.16	0.02	0.08	0.00	0.03	0.01	0.00	0.00	9.45	0.00	0.00	9.53	8.65
Wellpad Reclamation	0.07	0.03	0.18	0.00	0.14	0.02	0.00	---	20.40	0.00	0.00	20.54	18.64
Sub-total: Reclamation	0.07	0.03	0.18	0.00	0.14	0.02	0.00	0.00	20.40	0.00	0.00	20.55	18.64
Total Emissions (tons)	14.38	5.91	124.54	3.41	62.37	348.78	24.51	0.00	46,315.85	209.11	0.87	50,976.57	46,258.23

For this analysis, it is conservatively assumed that the total emissions as shown in Table 3-5 can be attributed to the federal oil and gas produced by the new 16 wells; this is a reasonable conservative assumption considering the location of the proposed well pads relative to the location of the federal lease (COC 075061). Figure 3-2 shows the location of the federal lease parcels surrounding the proposed well pad locations. As shown in Table 3-5, the bulk (~ 75%) of the NO_x emissions occur during the 60 day construction period and production phase NO_x emissions are primarily related to well pad level engines exhaust. Particulate matter emissions are low for the project primarily due to emissions control with water application during construction phase and approximately ~ 67% of total PM_{2.5} emissions would occur during the construction phase. VOC emissions are highest during production phase (~ 99% of total) mainly associated with fugitive leaks, storage tanks and blow down activities.

Table 3-6 below demonstrates a relative comparison of the project emissions to Weld County's emissions from 2010.

Table 3-6. Proposed Action & Weld County Emissions Comparisons¹

Pollutant	Emissions, Tons per year (Max)		
	16 – Project Wells	Weld County Total Emissions (2010)	Weld County Oil & Gas Emissions (2010)
NO _x	124.54	30,365	15,016.92
CO	62.37	91,338	11,244.13
VOC	348.78	135,941	102,796.1
PM ₁₀	14.38	29,948	593.82
PM _{2.5}	5.91	No data	No data
SO _x	3.41	545	112.71
HAPs	24.51	354	150.63

¹ CDPHE 2010 APEN Online Emissions Inventory (most current available). CDPHE HAP inventory is for benzene only.

The BLM COSO recently completed two near-field air quality modeling analyses in year 2013 for oil and gas construction and production emissions levels similar to the levels for the Proposed Action. The near-field modeling analyses predicted short-term averaged ambient concentrations for the following criteria pollutants: NO₂ (1-hour) and PM_{2.5} (24-hour). These pollutants and averaging periods were modeled because of the short-term temporal nature of the construction related activities (most project related emissions originate from short-term construction activities similar to the annual emissions profile for the Proposed Action), and due to the complexity of meeting air quality standards for these pollutants and averaging times. For both modeling analyses, emissions estimates accounted for drilling and completion engines, well-head production engines, well pad and road construction and traffic. The following provides information and details for both near-field modeling analyses that were performed:

- An AERMOD near-field modeling assessment was conducted (March, 2013) to quantify and evaluate maximum pollutant impacts in the vicinity of 12 new oil and gas wells in Weld County, Colorado. Maximum annual emissions modeled for this project (includes construction and production activities) were 106 TPY of NO₂ and 5 TPY of PM_{2.5}. AERMOD predicted concentrations for project related emissions added to representative background concentrations were below ambient air quality standards for both pollutants and averaging times.
- An AERMOD near-field modeling assessment was conducted (December, 2013) to quantify and evaluate maximum pollutant impacts in the vicinity of ~ 75 new oil and gas wells in Piceance Basin, Colorado. Maximum annual emissions modeled for this project (includes construction and production activities) were 112 TPY of NO₂ and 4 TPY of PM_{2.5} (emissions on a per well basis are relatively low due to additional emissions controls). AERMOD predicted concentrations for project related emissions added to representative background concentrations were below ambient air quality standards for both pollutants and averaging times.

As described above, recently completed near-field modeling analyses for emissions levels similar to those for the Proposed Action demonstrate compliance with ambient air quality standards. Much like the Proposed Action, the geographic setting for the projects described above was very rural. Ambient air receptors were modeled close (distance separating emissions sources and first ambient receptor) to the oil and gas emissions sources for those projects. The near-field modeling domain and emissions sources for the Proposed Action would be setup and modeled very similar to the other projects described above because all of these projects account for similar oil and gas activities and operations. Based on this information, it is reasonable to assume that near-field air quality impacts for criteria pollutants (except ozone) for the Proposed Action would be acceptable and in compliance with applicable ambient air quality standards.

Protective / Mitigation Measures: Multiple near-field modeling assessments performed by the BLM Colorado for Colorado-based oil and gas air quality assessments indicate that water (or product with equivalent dust control) application to unpaved surfaces is necessary during the oil and gas development / construction phase to achieve air quality compliance even though construction phases last just a few months. The short-term particulate matter air quality standards do not allow for many exceedances per year and therefore could be exceeded multiple times with only a couple of weeks of non-emissions controlled construction activities.

As shown in Figure 3-1, the project is located only ~ 9 miles from the 8-hr ozone NAA boundary. Air quality monitors are used to indicate whether an area is in compliance with air quality standards and the lack of monitors in the project area (and further north and east of the ozone NAA) as shown in Figure 3-1 makes it not clear to determine whether the project area is actually in compliance with the 8-hr ozone standard. Also, the EPA is currently re-evaluating the 8-hr ozone standard and is possibly going to reduce the standard in the near future. For these reasons, it is appropriate to suggest that the applicant apply the oil and gas NSPS OOOO requirements (Table 3-4) to all activities regardless if the well is classified as oil or as gas (NSPS OOOO regulations currently apply to “natural gas” wells), to potentially eliminate establishing a new ozone NAA boundary that would include the project area. These suggestions include the

assumptions for the emissions inventory for this analysis which account for green completions, 95% VOC controls on all storage tanks and low-bleed pneumatic devices. It is also suggested that no natural gas is vented to the atmosphere during well blow downs or maintenance or re-working of a well, but rather captured or combusted using a flare or combustion device. These actions would greatly reduce the overall project related ozone precursor VOC and HAPs emissions.

It is anticipated that the operator would apply for either an APCD air permit for the site as a whole, or cover individual equipment under one of Colorado's general permits for oil and gas operations. The state as the regulatory authority for oil and gas actions requires controls of emissions and standards for compliance that the operator will be subject to. It is expected that the operator will comply with the requirements and make every effort to minimize emissions through good engineering and operating practices to the maximum extent practical.

In addition to the existing state and federal requirements, the following BLM requirements will apply:

- COA - all drill rigs, fracing and completion related engines will be required to meet EPA Non-Road Tier II Emissions Standards (or cleaner) for all well development operations.
- COA – applicant will apply water or dust-suppressant to unpaved surfaces likely to be disturbed (roads and well pad) to achieve at least 50% dust control during construction / well development phase.
- COA - green completion will be implemented for all well developments.
- COA - VOC emissions controls achieving at least 90% control efficiency will be applied to all storage tanks.
- COA – the applicant is required to operate low-bleed pneumatic devices only for the project wells.
- The applicant will not allow for natural gas venting during well blow downs or maintenance or re-working of a project well.

No Action Alternative

Direct and Indirect Impacts: None

Cumulative Impacts: None

Mitigation/Residual Effects: None

3.2.2 GEOLOGIC AND MINERAL RESOURCES

Affected Environment: The proposed wells are located within the Wattenberg gas field in the Denver Basin, where the primary target is the Codell/Niobrara oil and gas. Most oil and gas in the Denver Basin has been produced from Cretaceous sandstones: J-Sandstone, Codell Sandstone, Niobrara Formation, Hygiene Sandstone, and Terry Sandstone (also known informally as the Sussex and Shannon Sandstones). The Project Area is surrounded by privately owned producing gas wells on a Colorado state spacing order of 20 acres per well.

Groundwater resources in the area include the Laramie-Fox Hills aquifer, the lowermost of the Denver Basin aquifer system. The aquifer underlies approximately 6,700 square miles and marks the areal extent of the basin for economic ground water development. The Laramie-Fox Hills aquifer is from 250 to 300 feet thick, and includes about 150 to 200 feet of fine-grained and medium-grained sandstone. Water is also present in the Upper Pierre Shale at depths of up to 1,500 feet (CDWR, 2013). Water from the aquifer is used extensively throughout the area for domestic and agricultural purposes. Well yields may be as high as 100 gallons per minute (GPM), but are generally somewhat lower. Both the Laramie-Fox Hills and Arapahoe aquifers are under artesian pressure at the present time.

In addition to oil and gas, uranium and coal resources are also found in Weld County. Uranium resources are found in the Upper Laramie Formation north of Greeley. Coal resources are found throughout the Denver Basin in the Denver Formation and the upper Laramie Formation in the Denver Basin, although most of the coal resources in the Denver Basin have come from Laramie Coals. Sand and gravel resources are also located throughout Weld County; several sand and gravel pits have also been developed within five miles of the proposed wells.

Environmental Effects

Proposed Action (Direct and Indirect Impacts)

The Proposed Action would drill through the Laramie-Fox Hills aquifer to produce hydrocarbons from underlying formations. The Laramie formation contains important coal and uranium deposits. During drilling operations on parcels, loss of circulation or problems cementing the surface casing could directly affect freshwater aquifer and mineral zones encountered. Known water-bearing zones in the APD areas would be protected by drilling requirements and, with proper practices, contamination of ground water resources is highly unlikely.

No Action Alternative (Direct and Indirect Impacts)

Under the No Action alternative, the APDs would be denied, and no federal action would occur. Not approving the APDs could result in a situation in which reservoirs are not adequately developed, and public minerals could be drained by nearby private or state wells. The applicant could explore and develop the private land and private minerals and not access the federal minerals. Drainage cases commonly occur in northeastern Colorado where land and mineral ownership patterns are complex.

Protective/Mitigation Measures

Onshore Order #2 requires that the proposed casing and cementing programs shall be conducted as approved to protect and/or isolate all usable water zones and prospective mineral zones. At the APD stage, geologic and engineering reviews will be completed to ensure that cementing and casing programs are adequate to protect all downhole resources. Known water bearing zones in the APD area are protected by drilling requirements and, with proper practices, contamination of ground water resources is highly unlikely. Casing along with cement would be extended well beyond fresh-water zones to ensure that drilling fluids remain within the well bore and do not enter groundwater.

3.2.3 SOILS (includes a finding on standard 1)

Affected Environment:

The Proposed wells would be located in a dry upland setting mainly used as open rangeland. The Weld county soil survey has identified the soil series in the proposed project area as:

For the Razor 12-F:

Approximately 50% of the proposed pad would be on the Ascalon fine sandy loam, 0-6% slopes and 50% on the Bushman fine sandy loam, 3-9%. Slopes are 0 to 9 percent. These soils are on fans and plains. The parent material consists of calcareous, loamy alluvium. Depth to a root restrictive layer is greater than 80 inches. The natural drainage class is well drained. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 80 inches. The Bushman fine sandy loam soil is in the R067BY024CO Sandy Plains ecological site and the Ascalon fine sandy loam is in the R067BY002CO Loamy Plains ecological site. This soil does not meet hydric criteria. The calcium carbonate equivalent within 40 inches, typically, does not exceed 15 percent. The Ascalon fine sandy loam, 0-6% slopes is listed as farmland of statewide importance.

For the Razor 12-G:

This proposed pad lies on the Keith loam, 0-6% slopes soil. These soils are on swales, stream terraces and plains. The parent material consists of calcareous, loamy alluvium. Depth to a root restrictive layer is greater than 80 inches. The natural drainage class is well drained. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 80 inches. These soils are in the R067BY002CO Loamy Plains ecological site. This soil does not meet hydric criteria. The calcium carbonate equivalent within 40 inches, typically, does not exceed 10 percent. The Keith loam, 0-6% slopes soil is classified as prime farmland if irrigated.

For the Razor 12-H:

This pad is partially already in existence and would be located on the Nucla loam, 0-3% slopes soil. These soils are on plains. The parent material consists of calcareous, loamy alluvium. Depth to a root restrictive layer is greater than 80 inches. The natural drainage class is well drained. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 80 inches. These soils are in the R067BY002CO Loamy Plains ecological site. This soil does not meet hydric criteria. The calcium carbonate equivalent within 40 inches, typically, does not exceed 15 percent. The Nucla loam, 0-3% slopes soil is listed as farmland of statewide importance.

Environmental Effects

The proposed development could result in a small percent of increased wind erosion during initial operations of associated with construction and drilling. A high risk of windblown erosion will continue until those disturbed lands are hardened, reclaimed by vegetation cover, protected by tackifier, straw, or manure, or protected by other methods. Overall-negative effects to soil resources, such as loss of top soil resulting from wind erosion should be reduced significantly through the correct implementation of interim and final reclamation measures and the implementation of BMPs during the construction.

Proposed Action

Direct and Indirect Impacts: This action would result in up to 36.9 acres of total combined new and previously disturbed surface disturbance. Long term disturbance after interim reclamation would be approximately 10.5 acres. This is assuming successful interim reclamation including re-contouring, seeding, and necessary stabilization. The

proposed action would have a moderate to major direct impact to soils present at the construction site. Indirectly, the increased runoff from the disturbed soils could result in increased erosion and gullying down gradient. Due to the gentle slopes and construction standards being proposed impacts to soils off site would be minor.

Cumulative Impacts: The area around the proposed wells has a variety of factors effecting soils including roads, housing, agriculture, and livestock grazing. The addition of the infrastructure needed to drill the pads would have an additional impact to the areas soils. In the long term, if economical quantities of oil and gas are found, additional wells can be expected to be drilled. This could add a large amount of disturbance that could have a larger impact on soils in the future.

Mitigation/Residual Effects: After completion and/or abandonment of the wells, the soils would still be irreversibly different than they originally were. Overall, with the proposed reclamation, soil productivity would not be considerably altered if the proposed areas are abandoned. All infrastructure (roads, drill pads, etc.) being proposed, would be built to BLM Gold Book standards. No additional mitigation would be required.

No Action Alternative

Direct and Indirect Impacts: It is likely that under this alternative the facilities would still be constructed on entirely private property and the impacts to soil resources would be approximately the same.

Protective/Mitigation Measures: N/A

3.2.4 WATER (SURFACE AND GROUNDWATER, FLOODPLAINS)

Affected Environment: The proposed wells would be located in a dry upland setting tributary to the South Platte River with no perennial surface water nearby. Groundwater in this area consists of the Laramie Fox-Hills aquifer that is used for domestic and agricultural purposes and is generally produced from artesian wells. This aquifer can be up to 350 feet thick, although total thickness of water yielding material rarely exceeds 200 feet. The Lower Fox Hills and upper Pierre Aquifer or upper transition zone of the Pierre shale are also important water resources that should be protected, this interval occurs at depths of about 600' to 1500'. Underlying the Fox Hills is nearly 5,000 feet of Pierre Shale. Based on state records, there is 1 water well within a one mile radius of the proposed wells and target downhole locations; however, based on cattle trailing seen in aerial photos it appears there may be more water wells than shown in the state records. This well is listed as being 27 feet deep. Water required for the drilling and completion of the wells would be obtained from a nearby water well (permit #69175) located in the SWSW Section 26, T12N-R58W and transported via truck to the proposed location.

Environmental Effects

Proposed Action

Direct and Indirect Impacts: Surface water impacts of the proposed wells are mainly associated with the surface disturbance associated with drilling and related infrastructure after well completion. For all proposed development, 36.9 acres would be disturbed. Most of this disturbance would be new. Most impacts to surface water from oil and gas activity is due to removal of vegetation and exposure of mineral soils. Specific impacts would be soil compaction caused by construction that would reduce the soil infiltration rates, in turn increasing runoff during precipitation events. Downstream effects of the increased runoff may include changes in downstream channel morphology such as bed and bank erosion or accretion. Due to the flat nature of the topography and infiltration rates of the soils in this area, little to no new impacts to surface water quality would result from the surface disturbance portion of drilling the proposed wells. Additional surface water impacts could result from chemicals, or other fluids, accidentally spilled or leaked during the development process and could result in the contamination of both ground and surface waters. Best management practices would be contained in the condition of approval that would mitigate this threat.

The drilling of the proposed wells would pass through usable groundwater. Groundwater in this area is relied on for agricultural uses, as well as, domestic use. Potential impacts to groundwater resources could occur if proper cementing and casing programs are not followed. This could include loss of well integrity, surface spills, or loss of fluids in the drilling and completion process. It is possible for chemical additives used in drilling activities to be introduced into the water producing formations without proper casing and cementing of the well bore. Changes in porosity or other properties of the rock being drilled through can also result in the loss of drilling fluids. When this occurs, drilling fluids can be introduced into groundwater without proper cementing and casing. Site specific conditions and drilling practices determine the probability of this occurrence and determine the groundwater resources that could be impacted. In addition to changing the producing formations' physical properties by increasing the flow of water, gas, and/or oil around the well bore; hydraulic fracturing can also introduce chemical additives into the producing formations. Types of chemical additives used in drilling activities may include acids, hydrocarbons, thickening agents, lubricants, and other additives that are operator and location specific. These additives are not always used in these drilling activities and some are likely to be benign such as bentonite clay and sand. Concentrations of these additives also vary considerably since different mixtures can be used for different purposes in oil and gas development and even in the same well bore. If contamination of aquifers from any source occurs, changes in groundwater quality could impact springs and water wells that are sourced from the affected aquifers. Onshore Order #2 requires that the proposed casing and cementing programs shall be conducted as approved to protect and/or isolate all usable water zones.

At this stage, geologic and engineering reviews have been done to ensure that cementing and casing programs are adequate to protect all downhole resources. Known water bearing zones in the APD area are protected by drilling requirements and, with proper practices, contamination of ground water resources is highly unlikely. Casing along with cement would be extended well beyond fresh-water zones to insure that drilling fluids remain within the well bore and do not enter groundwater.

Protective/Mitigation Measures: No additional mitigation is required to protect water resources beyond what is found in other sections of this document and other APD approval requirements.

No Action Alternative

Direct and Indirect Impacts: It is likely that under this alternative the facilities would still be constructed on entirely private property and the impacts to water resources would be the same.

Protective/Mitigation Measures: None

3.3 BIOLOGICAL RESOURCES

3.3.1 INVASIVE PLANTS*

Affected Environment: Invasive plants are common in the area due to historical agricultural practices. It is likely that the native plant community has been altered due to the long-term grazing practices in the area. The ecological sites that make up the project site are prone to a wide variety of weeds if severe soil surface disturbance occurs.

Environmental Effects

Proposed Action

Direct and Indirect Impacts: Due to the long-term exposure of the project area to historical agricultural practices, expected impacts are thought to be minor.

Protective/Mitigation Measures: Equipment used to implement the proposed action should be washed prior to entering the project area to remove any plant materials, soil, or grease. Areas disturbed by project implementation will be monitored for the presence of weeds on the Colorado State Noxious Weed list. Identified noxious weeds will be treated. Monitoring is required for the life of the project and for three years following completion and/or abandonment of the wells and elimination of identified Colorado State Noxious Weeds list A and B species.

No Action Alternative

Direct and Indirect Impacts: None

Protective/Mitigation Measures: None

*Invasive plants are plants that are not part of (if exotic), or are a minor component of (if native), the original plant community or communities that have the potential to become a dominant or co-dominant species on the site if their future establishment and growth are not actively controlled by management interventions, or are classified as exotic or noxious plants under state or federal law. Species that become dominant for only one to several years (e.g., short-term response to drought or wildfire) are not invasive plants.

3.3.2 VEGETATION

Affected Environment: The area around Razor 12 F, G, H supports blue gramma/buffalograss sod with cool season remnants. It is likely that the native plant community has been altered due to historic crop agriculture and the long-term grazing practices in the area.

Environmental Effects

Proposed Action

Direct and Indirect Impacts: Generally oil and gas development involves complete removal of vegetation and at times re-contouring of the landscape to allow for resources to be retrieved. The type of ground activity associated with oil and gas development does result in increased susceptibility to adverse impacts such as soil compaction, weed infestations and erosion (See Soils and Invasive Plants sections). Due to these adverse impacts, establishment of native vegetation similar to adjacent undisturbed vegetation can take up to 30 years.

Protective/Mitigation Measures: See 2.2.1 Proposed Action.

No Action Alternative

Direct and Indirect Impacts: None

Protective/Mitigation Measures: None

3.3.3 THREATENED, ENDANGERED AND SENSITIVE SPECIES

Affected Environment

No threatened or endangered species or habitats are located within the action area. BLM sensitive species with potential habitat include ferruginous hawk, mountain plover, black-tailed prairie dog, burrowing owl, swift fox, and milk snake.

Mountain Plover: Mountain Plover's are found throughout the Royal Gorge Field Office in suitable habitats. While the species is relatively rare they can be found generally in open, flat tablelands that display some function of disturbance such as drought, grazing, fire, etc.).

Black-tailed prairie dog: The BLM considers the black-tailed prairie dog a sensitive species. Black-tailed prairie dogs primarily occur in scattered colonies throughout the eastern plains of Colorado. In the summer of 2001, Colorado started aerial surveys for black-tailed prairie dogs throughout their historic range. Based on known locations of black-tailed prairie dogs, transects were developed for each county to give a 95% confidence interval to the resulting data. Statewide 631,000 acres of black-tail prairie dog colonies were documented.

Swift Fox: Swift foxes primarily occur in short-grass and mixed-grass prairie in the eastern plains of Colorado. The distribution of swift foxes became severely reduced in concert with conversion of mid- and shortgrass prairies to agriculture. Swift fox dens occur in ridges, slopes, hill tops, pastures, roadside ditches, fence rows and cultivated fields. Dens may be relatively close to human habitations and swift foxes occasionally den in human-made structures such as

culverts. Swift foxes primarily consume animals, with leporids and rodents the most frequent prey.

Milk snake: Wide variety of habitats in Colorado, including shortgrass prairie, sandhills, shrubby hillsides. Hibernation sites include rock crevices that may be shared with other snake species. The species occurs throughout most of Colorado at elevations primarily below 8,000 feet and is generally scarce or at least hard to find, but locally fairly common.

Ferruginous hawks: The ferruginous hawk inhabits grasslands and semi-desert shrublands, and is rare in piñon-juniper woodlands. Breeding birds nest in isolated trees, on rock outcrops, structures such as windmills and power poles, or on the ground. Winter residents concentrate around prairie dog towns. Winter numbers and distribution fluctuate greatly according to the availability of prairie dogs; when a local prairie dog population dies off due to plague, hawk numbers decrease drastically. Migrants and winter residents may also occur in shrublands and agricultural areas.

Winter resident on eastern plains, at the same time it is a rare summer resident locally on eastern plains, and occurs very locally in Moffat and Routt counties, along the Book Cliffs, in the Grand Valley, and in the San Luis Valley.

Environmental Effects

Proposed Action

Direct and Indirect Impacts: This area has been well developed for energy development, both renewable and non-renewable. The action area has experienced extensive oil and gas development with more than 200 wells occurring within six miles. Wind energy facilities are also present and located within two miles of the action area. In the short term, the primary direct impacts of the proposed action will be the loss of available habitat (32.5 acres due to pad construction for drilling phase, reduced to 10.5 acres after interim reclamation), and an increase in human presence and activity during the drilling phase. These effects will be reduced post drilling.

Protective/Mitigation Measures: Due to the fee/fee and fee/fee/fed nature of the surface and mineral estate, the Bureau of Land Management does not have the authority to attach protective/mitigation measures as conditions of approval unless supported by federal law. No special status species that may be present or have habitat within in the action area are federally protected; therefore, no protective/mitigation measures will be suggested as a result of the environmental assessment.

No Action Alternative

Direct and Indirect Impacts: The no action alternative effect will be similar to the proposed action effect due to the ownership status of surface lands and mineral estate. The pads may be constructed and fee/fee wells may be drilled without approval from the Bureau of Land Management while yielding an impact similar to the proposed action.

Protective/Mitigation Measures: None.

3.3.4 WILDLIFE TERRESTRIAL

Affected Environment

The shortgrass prairies of eastern Colorado are often used for grazing livestock. In the past they have supported an array of wildlife species including black-tailed prairie dog, American bison, elk, deer, and Pronghorn. Livestock production continues throughout much of the region where nonrenewable resource development and production is occurring. The private lands on which the wells are proposed are used for livestock grazing and oil and gas development supported by various infrastructure, including roads and well pads. Wildlife in the area is limited to species that have adapted to the increased development activity in the area; these include pronghorn, small mammals, mesocarnivores, raptors, and herpetofauna.

Environmental Effects

Proposed Action

Direct and Indirect Impacts: The Proposed Action would initially result in conversion of approximately 32.4 acres of shortgrass prairie to well pads and associated infrastructure. The majority of these areas would be reclaimed and revegetated, with 10.5 acres of permanent surface disturbance associated with the three pads. There would be a minor direct loss of suitable wildlife habitat in the area. Indirect impacts to wildlife could result from the increase in human activity during the drilling phase, causing an increase in stress to wildlife or limiting movement throughout the Project Area. Decreased human activity during the production phase would reduce these potential indirect impacts to wildlife as well.

Protective/Mitigation Measures: Due to the fee/fee and fee/fee/fed nature of the surface and mineral estate, the Bureau of Land Management does not have the authority to attach protective/mitigation measures as conditions of approval unless supported by federal law. No terrestrial wildlife species that may be present or have habitat within in the action area are federally protected; therefore, no protective/mitigation measures will be suggested as a result of the environmental assessment.

No Action Alternative

Direct and Indirect Impacts: The no action alternative effect will be similar to the proposed action effect due to the ownership status of surface lands and mineral estate. The pads may be constructed and fee/fee wells may be drilled without approval from the Bureau of Land Management while yielding an impact similar to the proposed action.

Protective/Mitigation Measures: None.

3.3.5 MIGRATORY BIRDS

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

Within the context of the MBTA, “migratory” birds include non-migratory “resident” species as well as true migrants, essentially encompassing most native bird species. The nesting time period is of special importance as the ability to create a nest, incubate, and rear chicks to fledging is a vulnerable time period for birds, and disturbances to nesting activities can lead to larger consequences for individual birds. In addition, because birds are generally territorial during the nesting season, their ability to access and utilize sufficient food is limited by the quality and availability 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.

Affected Environment

The Proposed Action is located in the shortgrass prairie ecosystem in private fields used for livestock grazing. The following species are on the U.S. Fish and Wildlife Services “Birds of Conservation Concern-2008 List” for BCR-18 (Shortgrass Prairie) and might occur in the project area based on their habitat requirements: ferruginous hawks, prairie falcons, mountain plovers, upland sandpiper, Sprague’s pipit, lark buntings, and Cassin’s sparrow.

Environmental Effects

Proposed Action

Direct and Indirect Impacts: The Project Area and surrounding area is already disturbed by oil and gas development. Some birds have adapted to and currently use habitat patches within well fields for reproduction and growth. Surface disturbing activities associated with implementation of the Proposed Action would occur during the winter months of December, January, and February, which is outside nesting season for these birds. Noise generated during construction, drilling, and production phases will likely result in a larger impact footprint than the disturbance footprint alone.

Protective/Mitigation Measures: To be in compliance with the Migratory Bird Treaty Act (MBTA) and the Memorandum of Understanding between BLM and USFWS required by Executive Order 13186, BLM must avoid actions, where possible, that result in a “take” of migratory birds. Under the MBTA, “take” means to pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in such conduct. All mortality or injury to species protected by the MBTA shall be reported immediately to the BLM project lead and to the USFWS representative.

Pursuant to BLM Instruction Memorandum 2008-050, to reduce impacts to Birds of Conservation Concern (BCC), no habitat disturbance (removal of vegetation such as timber, brush, or grass) is allowed during the periods of May 15 - July 15, during the breeding and brood rearing season for most Colorado migratory birds. An exception to this TL will be granted if nesting surveys conducted no more than one week prior to surface-disturbing activities indicate no nesting within 30 meters (100 feet) of the area to be disturbed. Surveys shall be conducted by a qualified breeding bird surveyor between sunrise and 10:00 a.m. under favorable conditions. This provision does not apply to ongoing construction, drilling, or completion activities that are initiated prior to May 15 and continue into the 60-day period.

Any secondary containment system will be covered in a manner to prevent access by migratory birds. The operator will construct, modify, equip, and maintain all open-vent exhaust stacks on

production equipment to prevent birds and bats from entering, and to discourage perching, roosting, and nesting. Production equipment includes, but may not be limited to, tanks, heater-treaters, separators, dehydrators, flare stacks, and in-line units. Any action that may result in a “take” of individual migratory birds or nests that are protected by MBTA will not be allowed.

No Action Alternative

Direct and Indirect Impacts: The no action alternative effect will be similar to the proposed action effect due to the ownership status of surface lands and mineral estate. The pads may be constructed and fee/fee wells may be drilled without approval from the Bureau of Land Management while yielding an impact similar to the proposed action.

Protective/Mitigation Measures: None.

3.4 HERITAGE RESOURCES AND HUMAN ENVIRONMENT

3.4.1 ECONOMICS

Although this project only affects the outcome of 16 proposed wells, the Oil and Gas industry as a whole has a significant impact on the economy. Not only does oil and gas development directly create higher than average paying jobs, it also increase demand for employees of related support fields, such as transportation, equipment fabrication, construction, gas stations, restaurants ect. Aside from the creation of jobs, the production of oil and gas directly generates revenue for federal, state and local governments through taxes, fees and royalties.

A 2013 study by the CU Leeds School of Business (Lewandowski and Wobbekind,2013) illustrated the economic benefits of oil and gas development in Colorado. It showed that the oil and gas industry directly contributed almost \$1.6 billion to state and local governments, schools and other special districts in Colorado in 2012. The study found that oil and gas development accounted for about 51,200 jobs in Colorado, most of which pay more wages more than twice of the average wage in the state. In addition, it was estimated that the industry resulted in 60,245 indirect and induced jobs in Colorado, for a total of 111,476 jobs supported by the oil and gas development industry in the state in 2012. The study concluded that the oil and gas industry generated \$29.6 billion in output in Colorado’s economy in 2012.

These figures don’t account for the fees, royalties and lease payments made to the federal government for development of federal oil and gas estate, or take into account the positive economic impact that results from the use of affordable petroleum products for fuels and the produces manufactured with them. The production of domestic petroleum products has the added benefit of reducing the nation’s dependence on foreign energy.

3.4.2 PALEONTOLOGICAL RESOURCES

Affected Environment: The proposed wells are geographically located in grassland overlying part of the geologic feature that is the eastern flank of the Denver Basin. The Basin consists of a large asymmetric syncline of Paleozoic, Mesozoic, and Cenozoic sedimentary rock layers, trending north to south along the east side of the Front Range from about Pueblo north to Wyoming. The basin is deepest near Denver and ascends gradually to its eastern outcrop in central Kansas. The White River Formation underlies the proposed well locations. The White River formation is a Class 5 geologic formation, according to the BLM's Potential Fossil Yield Classification (PFYC) System, which was created to assist in determining proper mitigation approaches for surface disturbing activities (WO IM2008-009). This is a Class 5 formation because it is highly fossiliferous and indicates the highest potential for paleontologic resources. The potential for this proposed project to be sited on or impact a significant fossil locality is high.

Environmental Effects

Proposed Action (Direct and Indirect Impacts)

Potential impacts to fossil localities would be both direct and indirect. Direct impacts to or destruction of fossils would occur from unmitigated activities conducted on formations with high potential for important scientific fossil resources. Indirect impacts would involve damage or loss of fossil resources due to the unauthorized collection of scientifically important fossils by workers or the public due to increased access to fossil localities in the Project Area. Adverse impacts to important fossil resources would be long-term and significant since fossils removed or destroyed would be lost to science. Adverse significant impacts to paleontological resources can be reduced to a negligible level through mitigation of ground disturbing activities. It is possible that the proposed project would have the beneficial impact that ground disturbance activities might result in the discovery of important fossil resources.

The BLM recommends that a field inventory be performed prior to any surface disturbing activity. Depending on the results of the inventory, monitoring during construction may be recommended. If any significant fossils are found, development of a research design and data recovery may also be recommended before the project proceeds. Any fossils recovered on private land belong to the private landowner; however, the BLM recommends the use of a federally approved repository for storage of any fossils recovered in these efforts.

In many instances where the surface estate is not owned by the federal government, the mineral estate is, and is administered by the BLM. Paleontological resources are considered to be part of the surface estate. If the BLM is going to approve an action involving the mineral estate that may affect the paleontological resources, the action should be conditioned with appropriate paleontological mitigation recommendations to protect the interests of the surface owner. The surface owner may elect to waive these recommendations; such a waiver must be documented in the casefile.

No Action Alternative (Direct and Indirect Impacts)

Under the No Action alternative, the applicant could explore and develop the private land and private minerals and not access the federal minerals. Direct and indirect impacts to paleontological resources would be the same as those described for the Proposed Action.

Protective/Mitigation Measures

The proposed construction of the well pads, access to the well pads, and pipelines may penetrate the protective soil layer impacting the bedrock unit below. Because a highly fossiliferous (Class 5) formation is present and susceptible to adverse impacts, mitigation measures are required. The BLM recommends that a field inventory be performed prior to any surface disturbing activity. Depending on the results of the inventory, monitoring during construction may be recommended. If any significant fossils are found, development of a research design and data recovery may also be recommended before the project proceeds. Any fossils recovered on private land belong to the private landowner; however, the BLM recommends the use of a federally approved repository for storage of any fossils recovered in these efforts.

In many instances where the surface estate is not owned by the federal government, the mineral estate is, and is administered by the BLM. Paleontological resources are considered to be part of the surface estate. If the BLM is going to approve an action involving the mineral estate that may affect the paleontological resources, the action should be conditioned with appropriate paleontological mitigation recommendations to protect the interests of the surface owner. The surface owner may elect to waive these recommendations; such a waiver must be documented in the casefile.

3.4.3 WASTES, HAZARDOUS OR SOLID

Affected Environment: It is assumed that conditions associated with the proposed project site, both surface and subsurface, are currently clean and that there is no known contamination. A determination will be made by the operator prior to initiating the project, if there is evidence that demonstrates otherwise (such as solid or hazardous wastes have been previously used, stored, or disposed of at the project site).

Nothing in the analysis or approval of this action by BLM authorizes or in any way permits a release or threat of a release of hazardous materials (as defined under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended, 42 U.S.C. 9601 et seq., and its regulations) into the environment that will require a response action or result in the incurrence of response costs.

Environmental Effects

Proposed Action

Direct and Indirect Impacts: Possible contaminant sources associated with the drilling operations are:

- Storage, use and transfer of petroleum, oil and lubricants
- Produced fluids

- General hazardous substances, chemicals and/or wastes
- Concrete washout water
- Drilling water, mud and cuttings

Protective/Mitigation Measures: The following mitigation will assist in reducing potential spills resulting in groundwater and/or soil contamination:

- All Above Ground Storage Tanks will need to have secondary containment and constructed in accordance with standard industry practices or an associated Spill Prevention Control and Countermeasures plan in accordance with State regulations (if applicable).
- If drums are used, secondary containment constructed in accordance with standard industry practices or governing regulations is required. Storage and labeling of drums should be in accordance with recommendations on associated MSDS sheets, to account for chemical characteristics and compatibility.
- Appropriate level of spill kits need to be onsite and in vehicles.
- All spill reporting needs to follow the reporting requirements outlined in NTL-3A.
- No treatment or disposal of wastes on site is allowed on Federal Lands.
- All concrete washout water needs to be contained and properly disposed of at a permitted offsite disposal facility.
- If pits are utilized they need to be lined to mitigate leaching of liquids to the subsurface, as necessary. State and/or Federal regulations may apply to pit construction and removal.

No Action Alternative

Direct and Indirect Impacts: None

Protective/Mitigation Measures: None

3.5 CUMULATIVE IMPACTS SUMMARY

The proposed project is located in Weld County, Colorado. Weld County's economy is based primarily on agriculture (farming and livestock production) and oil and gas development. Due to this, most of the natural landscape of Weld County has been modified. Weld County has more than 25,000 active petroleum wells, more than any other county in the United States, according to Weld county commissioners. Most of these wells are located on privately owned surface and produce entirely privately owned minerals. BLM is involved in less than 5% of all petroleum wells in Weld County. Because of the comparatively small number of Federally owned mineral parcels in this area, the cumulative impact of Federal petroleum development is small but still additive to the impact of the overall petroleum development in Weld County.

Soils: The area around the proposed wells has a variety factors effecting soils including roads, housing, agriculture, and livestock grazing. The addition of the infrastructure needed to drill the pads would have an additional impact to the areas soils. In the long term, if economical

quantities of oil and gas are found, additional wells can be expected to be drilled. This could add a large amount of disturbance that could have a larger impact on soils in the future.

CHAPTER 4 - CONSULTATION AND COORDINATION

4.1 LIST OF PREPARERS AND PARTICIPANTS

Please see Interdisciplinary Team Review list for BLM Participants

4.2 TRIBES, INDIVIDUALS, ORGANIZATIONS, OR AGENCIES CONSULTED

Native American Tribes were consulted at the lease stage.

CHAPTER 5 - REFERENCES

Bureau of Land Management. 1986. Northeast Resource Area Management Plan and Record of Decision. Lakewood, Colorado.

Bureau of Land Management. 1991. Colorado Oil and Gas Leasing Environmental Impact Statement. Lakewood, Colorado.

Bureau of Land Management. 2008 H-1790-1 National Environmental Policy Handbook. Washington, D.C.

Lewandowski, Brian, Wobbekind, Richard. July 2013. *Assessment of Oil and Gas Industry, 2012 Industry Economic and Fiscal Contributions in Colorado*. Business Research Division, Leeds School of Business, University of Colorado Boulder.

Finding Of No Significant Impact (FONSI)

DOI-BLM-CO-200-2014-0010 EA

Based on review of the EA and the supporting documents, I have determined that the project is not a major federal action and will not have a significant effect on the quality of the human environment, individually or cumulatively with other actions in the general area. No environmental effects from any alternative assessed or evaluated meet the definition of significance in context or intensity, as defined by 43 CFR 1508.27. Therefore, an environmental impact statement is not required. This finding is based on the context and intensity of the project as described below:

RATIONALE:

Context: The BLM has already received 8 Application Permits to Drill (APDs), and is anticipating receiving 4 additional APDs proposing the construction of three well pads, and the drilling of 16 horizontal oil wells on private surface over private minerals, developing both private and federal minerals (fee/fee/fed).

The projects are in Weld County, approximately 17 miles east of the Town of Grover. The federal mineral estate is leased and subject to oil and gas development.

The general area description would be defined as rural rangeland located in the northeastern plains of Colorado, used primarily for livestock production and oil and gas development. There are a few county roads in the project area.

There is no public land or public roads or other public access in the project area.

Extensive oil and gas development has occurred in the area, mostly on private (fee) surface and private (fee) mineral estate.

Intensity:

I have considered the potential intensity/severity of the impacts anticipated from the proposed Razor 12 F, G, H APD project. Project decision relative to each of the areas suggested for consideration by the CEQ. With regard to each:

Impacts that may be beneficial and adverse:

There would be minor impacts to air quality from the proposed wells. Most of this would occur during the drilling phase. Potential impacts might occur to ground water; however such impacts should not occur if strict drilling requirements are followed. Other minor impacts might occur to wildlife and migratory birds but would be mitigated through the use of timing stipulations. Positive impacts include benefits in royalties and revenue generated to the federal government from productive wells. Other indirect effects could include effects due to overall employment opportunities related to the oil and gas and

service support industry in the region as well as the economic benefits to state and county governments related to royalty payments and severance taxes. Other beneficial impacts from the action would be the potential for productive wells being created that would add, albeit in a small way to national energy independence.

Public health and safety:

The proposed action will have a temporary negative impact to air quality through the generation of fugitive dust during the construction phase. Utilization of the road, surface disturbance, and construction activities such as drilling, hydraulic fracturing, well completion, and equipment installation will all impact air quality through the generation of dust related to travel, transport, and general construction. This phase will also produce short term emissions of criteria, hazardous, and greenhouse gas pollutants from vehicle and construction equipment exhausts. Once construction is complete the daily activities at the site will be reduced to operational and maintenance checks which may be as frequent as a daily visit. Emissions will result from vehicle exhausts from the maintenance and process technician visits. The pad can be expected to produce fugitive emissions of well gas, which contains mostly methane and a minor fraction of volatile organic compounds. Fugitive emissions may also result from pressure relief valves and working and breathing losses from any tanks located at the site, as well as any flanges, seals, valves, other infrastructure connections used at the site. Liquid product load-out operations will also generate fugitive emissions of VOCs and vehicular emissions. If the operator is unable to sell any produced gas from the well, then gas flaring will also produce emissions of criteria, HAP, and GHG emissions.

Unique characteristics of the geographic area:

The EA evaluated the area of the proposed action and determined that no unique geographic characteristics such as: wild and scenic rivers, prime or unique farmlands, Areas of Critical Environmental Concern, designated wilderness areas, wilderness study areas or Lands with Wilderness Characteristics; were present.

Degree to which effects are likely to be highly controversial:

The potential for controversy associated with the effects of the proposed action is low. There is no disagreement or controversy among ID team members or reviewers over the nature of the effects on the resource values on public land by the proposed action.

Degree to which effects are highly uncertain or involve unique or unknown risks:

The drilling of oil and gas wells has occurred historically over the past century and although the potential risks involved can be controversial, they are neither unique nor unknown. There is low potential of unknown or unique risks associated with this project due to numerous other well locations having been successfully drilled in this area of Weld County.

Consideration of whether the action may establish a precedent for future actions with significant impacts:

The proposed APDs will be limited to standard construction procedures associated with pad/road construction and drilling in Weld County and have occurred historically on split

and private mineral estate. There are no aspects of the current proposal that are precedent setting.

Consideration of whether the action is related to other actions with cumulatively significant impacts:

The action is a continuation of oil and gas activities that have historically occurred in the area. Continued oil and gas activity in the area will have minor but additive impacts to air and the production greenhouse gas emissions. The project area having been subject to historic drilling activity will continue to experience gradual depletion of the recoverable oil and gas products. Although past cattle grazing had contributed to cumulative impacts, there have been no other recent activities besides oil and gas that has contributed to cumulative impacts.

Scientific, cultural or historical resources, including those listed in or eligible for listing in the National Register of Historic Places:

No historic properties were recorded during the cultural resources inventories.

Threatened and endangered species and their critical habitat:

There are no known populations of T&E species in the action area.

Any effects that threaten a violation of Federal, State or local law or requirements imposed for the protection of the environment: The proposed action conforms with the provisions of NEPA (U.S.C. 4321-4346) and FLPMA (43 U.S.C. 1701 et seq.) and is compliant with the Clean Water Act and The Clean Air Act, the National Historic Preservation Act, Migratory Bird Treaty Act (MBTA) and the Endangered Species Act.

NAME OF PREPARER: Aaron Richter

SUPERVISORY REVIEW: /s/ Jay Raiford

NAME OF ENVIRONMENTAL COORDINATOR: /s/ Martin Weimer

DATE: 3/26/14

SIGNATURE OF AUTHORIZED OFFICIAL:

/s/ Keith E. Berger
Keith E. Berger, Field Manager

DATE SIGNED: 3/26/14

APPENDICES:

ATTACHMENTS:

**UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
ROYAL GORGE FIELD OFFICE**

DECISION RECORD

Project Name

DOI-BLM-CO-F02-2014-0010-EA

DECISION: It is my decision to authorize the Proposed Action as described in the attached EA. The proposed action is the construction of three well pads, and the drilling of 16 horizontal oil wells on private surface over private minerals, developing both private and federal minerals (fee/fee/fed).

The projects are in Weld County, approximately 17 miles east of the Town of Grover. The federal mineral estate is leased and subject to oil and gas development.

The proposed action was analyzed in the Environmental Assessment (EA) DOI-BLM-CO-F02-2014-010 and a Finding of No Significant Impact was reached and an EIS will not be prepared.

RATIONALE: This APD will develop oil and gas resources on Federal minerals Lease COC #75061 consistent with existing Federal lease rights provided for in the Mineral Leasing Act of 1920, as amended. Extensive oil and gas development has occurred throughout the project area, mostly on private mineral estate.

The project area currently has a high degree of alteration in the form of agricultural fields, roads, houses, and oil and gas production. The addition of the infrastructure needed to construct and drill the 16 proposed wells would have mostly temporary and overall minor impacts on resources present in the project area.

MITIGATION MEASURES\MONITORING:

Air Quality:

All drill rigs, fracing and completion related engines will be required to meet EPA Non-Road Tier II Emissions Standards (or cleaner) for all well development operations.

Applicant will apply water or dust-suppressant to unpaved surfaces likely to be disturbed (roads and well pad) to achieve at least 50% dust control during construction / well development phase.

Green completion will be implemented for all well developments.

VOC emissions controls achieving at least 90% control efficiency will be applied to all storage tanks.

The applicant is required to operate low-bleed pneumatic devices only for the project wells.

The applicant will not allow for natural gas venting during well blow downs or maintenance or re-working of a project well.

Geology and Mineral Resources: If the proposed project plans to utilize federal minerals in the construction of roads, pad building or for any other construction needs, then compliance with 43 CFR 3600 is required. The project proponent will need to submit an application for a mineral materials disposal with BLM, prior to any disturbance being initiated. Federal mineral materials regulations also apply to split estate (i.e. a private surface landowner could not dispose of federal mineral materials for this project, surface or subsurface, without prior authorization from the BLM).

BLM Onshore Order #2 (OO#2) requires that the proposed casing and cementing programs shall be conducted as approved to protect and/or isolate all usable water zones, lost circulation zones, abnormally pressured zones, and any prospectively valuable deposits of minerals. A review at the Application for Permit to Drill stage includes a geologic evaluation of the potential subsurface formations that will be penetrated by the wellbore, followed by an engineering analysis of the drilling program to ensure the well construction design is adequate to protect the surface and subsurface environment, including the potential risks identified by the geologist, and all known or anticipated zones with potential risks.

BLM will require that the surface casing be run across the aquifers, and placed at least 100 feet into a formation that should not fracture or breakdown with the maximum weighting of mud that may be needed when drilling to the depth that the intermediate casing is going to be set. Before drilling an intermediate hole, the surface casing will be cemented in place to surface between the casing and the formation.

A BLM representative may be on location during the casing and cementing of groundwater-protective surface casing and other critical casing and cementing intervals constructed to isolate subsurface zones that present high risk for potential adverse impact to human health or safety or at high risk potential for environmental contamination.

A cement bond log will be required on the production casing, to ensure the quality of the cement bond between the casing and the formation. A minimum of 100 feet of cement will be required above any producing interval, or any zone of interest. Remedial cementing procedures will be required when cementing doesn't meet BLM requirements.

If the proposed project plans to utilize federal minerals in the construction of roads, pad building or for any other construction needs, then compliance with 43 CFR 3600 is required. The project proponent will need to submit an application for a mineral materials disposal with BLM, prior to any disturbance being initiated. Federal mineral materials regulations also apply to split estate (i.e. a private surface landowner could not dispose of federal mineral materials for this project, surface or subsurface, without prior authorization from the BLM).

Invasive Plants: Equipment used to implement the proposed action should be washed prior to entering the project area to remove any plant materials, soil, or grease. Areas disturbed by project implementation will be monitored for the presence of weeds on the Colorado State Noxious Weed list. Identified noxious weeds will be treated. Monitoring is required for the life of the project and for three years following completion and/or abandonment of the wells and elimination of identified Colorado State Noxious Weeds list A and B species.

Migratory Birds: To be in compliance with the Migratory Bird Treaty Act (MBTA) and the Memorandum of Understanding between BLM and USFWS required by Executive Order 13186, BLM must avoid actions, where possible, that result in a “take” of migratory birds. Under the MBTA, “take” means to pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in such conduct. All mortality or injury to species protected by the MBTA shall be reported immediately to the BLM project lead and to the USFWS representative.

Pursuant to BLM Instruction Memorandum 2008-050, to reduce impacts to Birds of Conservation Concern (BCC), no habitat disturbance (removal of vegetation such as timber, brush, or grass) is allowed during the periods of May 15 - July 15, during the breeding and brood rearing season for most Colorado migratory birds. An exception to this TL will be granted if nesting surveys conducted no more than one week prior to surface-disturbing activities indicate no nesting within 30 meters (100 feet) of the area to be disturbed. Surveys shall be conducted by a qualified breeding bird surveyor between sunrise and 10:00 a.m. under favorable conditions. This provision does not apply to ongoing construction, drilling, or completion activities that are initiated prior to May 15 and continue into the 60-day period.

Any secondary containment system will be covered in a manner to prevent access by migratory birds. The operator will construct, modify, equip, and maintain all open-vent exhaust stacks on production equipment to prevent birds and bats from entering, and to discourage perching, roosting, and nesting. Production equipment includes, but may not be limited to, tanks, heater-treaters, separators, dehydrators, flare stacks, and in-line units. Any action that may result in a “take” of individual migratory birds or nests that are protected by MBTA will not be allowed.

Paleontologic Resources: The BLM recommends that a field inventory be performed prior to any surface disturbing activity. Depending on the results of the inventory, monitoring during construction may be recommended. If any significant fossils are found, development of a research design and data recovery may also be recommended before the project proceeds. Any fossils recovered on private land belong to the private landowner; however, the BLM recommends the use of a federally approved repository for storage of any fossils recovered in these efforts.

In many instances where the surface estate is not owned by the federal government, the mineral estate is, and is administered by the BLM. Paleontological resources are considered to be part of the surface estate. If the BLM is going to approve an action involving the mineral estate that may affect the paleontological resources, the action should be conditioned with appropriate paleontological mitigation recommendations to protect the interests of the surface owner. The

surface owner may elect to waive these recommendations; such a waiver must be documented in the casefile.

Wastes, Hazardous or Solid: The following mitigation will assist in reducing potential spills resulting in groundwater and/or soil contamination:

- All Above Ground Storage Tanks will need to have secondary containment and constructed in accordance with standard industry practices or an associated Spill Prevention Control and Countermeasures plan in accordance with State regulations (if applicable).
- If drums are used, secondary containment constructed in accordance with standard industry practices or governing regulations is required. Storage and labeling of drums should be in accordance with recommendations on associated MSDS sheets, to account for chemical characteristics and compatibility.
- Appropriate level of spill kits need to be onsite and in vehicles.
- All spill reporting needs to follow the reporting requirements outlined in NTL-3A.
- No treatment or disposal of wastes on site is allowed on Federal Lands.
- All concrete washout water needs to be contained and properly disposed of at a permitted offsite disposal facility.
- If pits are utilized they need to be lined to mitigate leaching of liquids to the subsurface, as necessary. State and/or Federal regulations may apply to pit construction and removal.

PROTEST/APPEALS: This decision shall take effect immediately upon the date it is signed by the Authorized Officer, and shall remain in effect while any appeal is pending unless the Interior Board of Land Appeals issues a stay (43 CFR 2801.10(b)). Any appeal of this decision must follow the procedures set forth in 43 CFR Part 4. Within 30 days of the decision, a notice of appeal must be filed in the office of the Authorized Officer at the Royal Gorge Field Office, 3028 E. Main, Cañon City, Colorado, 81212. If a statement of reasons for the appeal is not included with the notice, it must be filed with the Interior Board of Land Appeals, Office of Hearings and Appeals, U.S. Department of the Interior, 801 North Quincy St., Suite 300, Arlington, VA 22203 within 30 days after the notice of appeal is filed with the Authorized Officer.

SIGNATURE OF AUTHORIZED OFFICIAL:

/s/ Keith E. Berger
Keith E. Berger, Field Manager

DATE SIGNED: 3/26/14

ATTACHMENTS: