BLM

U.S. Department of the Interior
Bureau of Land Management

Environmental Assessment

Razor Federal 29L, 30J, 30L and 32O APDs

April, 2015

PREPARING OFFICE

U.S. Department of the Interior
Bureau of Land Management
Royal Gorge Field Office
3028 E. Main Street
Canon City, CO 81212

Environmental Assessment
Razor Federal 29L, 30J, 30L and 32O APDs

DOI-BLM-CO-F02-2014-0074 EA

Prepared by
U.S. Department of the Interior
Bureau of Land Management
Royal Gorge Field Office
Canon City, CO

April, 2015

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Table of Contents

Chapter 1 Introduction

1.1. Identifying Information:

1.1.1. Title, EA number, and type of project:

Razor 29L, 30J, 30L, and 32O APDs

DOI-BLM-CO-F020-2014-0074 EA

1.1.2. Location of Proposed Action:

6th PM, 10N 58W S29, 30 and 32

1.1.3. Name and Location of Preparing Office:

Royal Gorge Field Office

1.1.4. Identify the Subject Function Code, Lease, Serial, or Case File Number:

COC 49320 and COC 61148

1.1.5. Applicant Name:

Whiting Oil and Gas

1.2. Introduction and Background

This EA has been prepared by the BLM to analyze environmental impacts of the construction of four well pads and the drilling of up to 19 horizontal oil wells on private surface estates/over private mineral estates (fee/fee), to develop federal and private (fee) minerals. The projects are located on rangeland in Northeast Weld County approximately 15 miles northeast of the town of Keota, Colorado. 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 over federal minerals (off lease), 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 Production will specifically target petroleum resources in the Niobrara formation underlying the private and BLM leases. The need for the action is to develop oil and gas resources on Federal Lease COC49320 and COC61148 consistent with existing Federal lease rights provided for in the Mineral Leasing Act of 1920, as amended, and consistent with the fluid minerals provision in the RGFO RMP, and Federal Oil and Gas onshore orders.

1.4. Decision to be Made

The BLM will decide whether to approve the Razor 29L, 30J, 30L and 32O 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 four 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/Page: 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

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: Internal scoping conducted by the RGFO Interdisciplinary Team (ID Team) and external scoping by posting this project on the Royal Gorge Field Office NEPA website, was the primary mechanism used by the BLM to initially identify issues.

Issues Identified: No issues were identified during public scoping.

Chapter 2 Proposed Action and Alternatives

2.1. Description of the Proposed Action

The BLM RGFO has received 15 Application for Permit to Drill (APD), and is anticipating receiving 4 additional APDs in the near future, proposing the construction of four well pads, access roads, and the drilling of 19 horizontal oil wells on private surface over private minerals, developing both private and federal minerals (fee/fee/fed). The operator plans to drill completely fee (100% private) wells from the surface of some or all of these proposed pads, regardless of the BLM's decision on the proposed federal 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.

Since totally fee wells are planned for these pads, which are located on private surface over private minerals, the operator may construct pad(s) and drill totally fee wells prior to issuance of any BLM APD(s), depending on rig and permitting schedules. However, a well intended to be completed in BLM minerals shall not be drilled until a BLM APD is issued to the operator for that well.

The general area description would be defined as rural rangeland (shortgrass prairie)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. There is no public land 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

Proposed Action

Individual pad details:

Razor 29L Pad: The new or improved portion of the access road will be approximately 500' in length, 25' wide (15' running surface, 5' borrow ditches). This will result in approximately .25 acre disturbance. The maximum slope of road is less than 3% and the only cut/fills associated with the road are what is necessary to crown and ditch road. The road will be surfaced with gravel.

The proposed Razor 29L pad is the planned surface location of 4 horizontal fee/fee/fed oil wells. It will have a maximum cut of approximately 3.5 feet with no fill resulting in approximately 4,190 cu yards of excess material, plus 6,700 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 9 acres of new surface disturbance, which would be reduced to approximately 3 acres after successful interim reclamation.

Razor 30J Pad: The new or improved portion of the access road will be approximately 1000' in length, 25' wide (15' running surface, 5' borrow ditches). This will result in approximately .5 acre disturbance. The maximum slope of road is less than 3% and the only cut/fills associated with the road are what is necessary to crown and ditch road. The road will be surfaced with gravel.

The proposed Razor 30J pad is the planned surface location of 4 horizontal fee/fee/fed oil wells. It will have a maximum cut of approximately 13.5 feet and a maximum fill of approximately 13 feet resulting in approximately 100 cu yards of excess material, plus 7,220 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 9 acres of new surface disturbance, which would be reduced to approximately 3 acres after successful interim reclamation.

Razor 30L Pad: The new or improved portion of the access road will be approximately 1300' in length, 25' wide (15' running surface, 5' borrow ditches). This will result in approximately .75 acre disturbance. The maximum slope of road is less than 3% and the only cut/fills associated with the road are what is necessary to crown and ditch road. The road will be surfaced with gravel.

The proposed Razor 30L pad is the planned surface location of 8 horizontal fee/fee/fed oil wells. It will have a maximum cut of approximately 4 feet and a maximum fill of approximately 1 foot resulting in approximately 9,490 cu yards of excess material, plus 6,760 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 9 acres of new surface disturbance, which would be reduced to approximately 3 acres after successful interim reclamation.

Razor 32O Pad: Access to the proposed Razor 32O pad will be directly from WCR 110, no new access road construction will be necessary.

The proposed Razor 30J pad is the planned surface location of 4 horizontal fee/fee/fed oil wells. One of these four wells was recently permitted through this BLM office, and was analyzed in a previous NEPA document, At this time, the pad has not yet been constructed and the well has not drilled been. Since that time, the operator decided to drill three additional fee/fee/fed wells from this location. In order to do so, the planned pad had to be expanded, so the updated pad is analyzed in this EA. The pad will have a maximum cut of approximately 7 feet and a maximum fill of approximately 2.5 feet resulting in approximately 6,260 cu yards of excess material, plus 6,770 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 9 acres of new surface disturbance, which would be reduced to approximately 3 acres after successful interim reclamation.

100% of the water used for the entire project will be obtained from wells designated by the State of Colorado as non-tributary to the South Platte River, and will be transported via truck and temporary hand laid surface pipeline. These sources are leased or owned by A&W Water Services (Poston well, 12N 59W S 31, Non-tributary from Ogallala formation) and Grassland Water Solutions (various wells producing from the Upper Crow Creek designated groundwater basin, which is designated non-tributary. The estimated water use is approximately 11.2 acre feet/well.

Construction and reclamation of pads and roads will be done in accordance with BLM's Gold Book standards, and employ applicable oil field BMPs. Stormwater/erosion control measures will be taken to stabilize the site. The proposed drilling and completion of all wells will utilize closed loop systems. The wells will be drilled horizontally, and completed using hydraulic fracturing techniques. All liquids will be stored in tanks on the pad. No pits will be utilized on location. Completion fluids will be flowed back to enclosed steel tanks. Drill cuttings will be bio-remediated onsite, in accordance with state regulations, 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 of construction, drilling and completion is estimated to be 19 days per well.

Interim reclamation of each pad will begin within 6 months (weather permitting) of completion of the 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 will 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. 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, and 43 CFR §3100.

Figure 2.1.

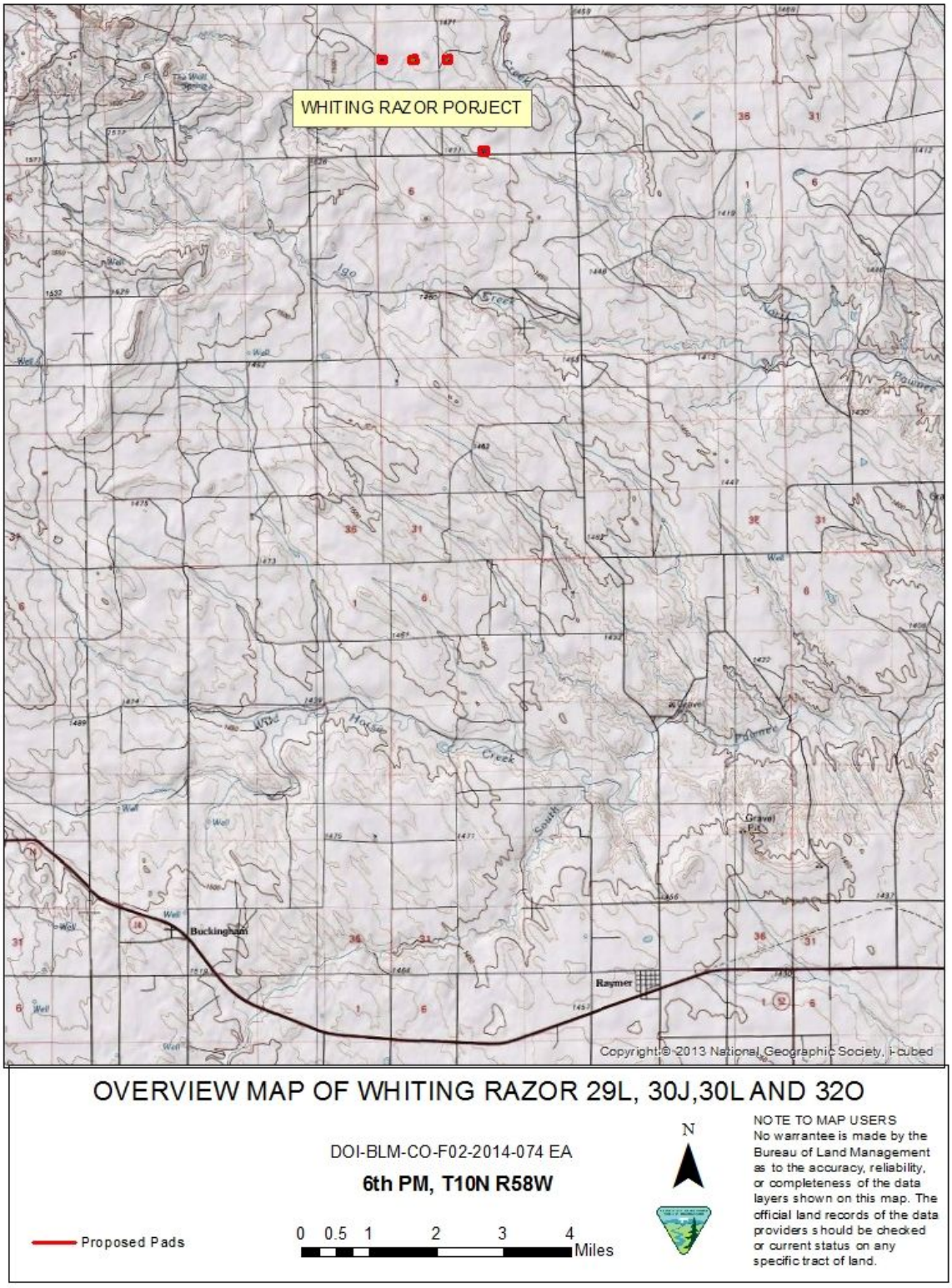
WHITING RAZOR PORJECT
Buckingham
Raymer
Copyright © 2013 National Geographic Society, i-cubed
OVERVIEW MAP OF WHITING RAZOR 29L, 30J,30L AND 32O
DOI-BLM-CO-F02-2014-074 EA
6th PM, T10N R58W
Proposed Pads
0 0.5 1 2 3 4
Miles
N
NOTE TO MAP USERS
No warrantee is made by the Bureau of Land Management as 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.

Figure 2.2.

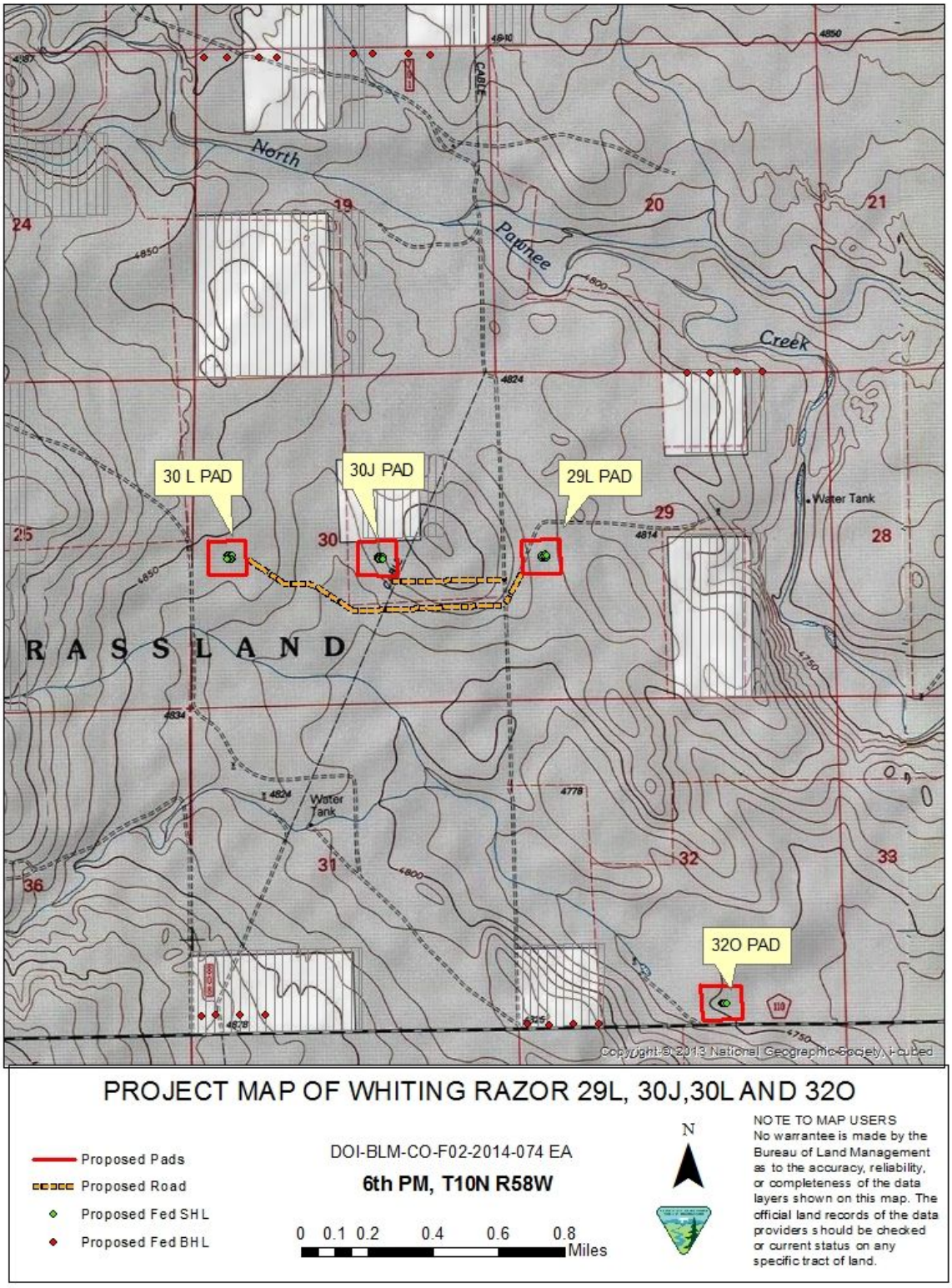
North
Pawnee
Creek
30 L PAD
30J PAD
29L PAD
32O PAD
Water Tank
Water Tank
RASSLAND
19
20
21
24
25
28
29
30
31
32
33
36
Copyright © 2013 National Geographic Society, i-cubed
PROJECT MAP OF WHITING RAZOR 29L, 30J,30L AND 32O
Proposed Pads
Proposed Road
Proposed Fed SHL
Proposed Fed BHL
DOI-BLM-CO-F02-2014-074 EA
6th PM, T10N R58W
0 0.1 0.2 0.4 0.6 0.8
Miles
N
NOTE TO MAP USERS
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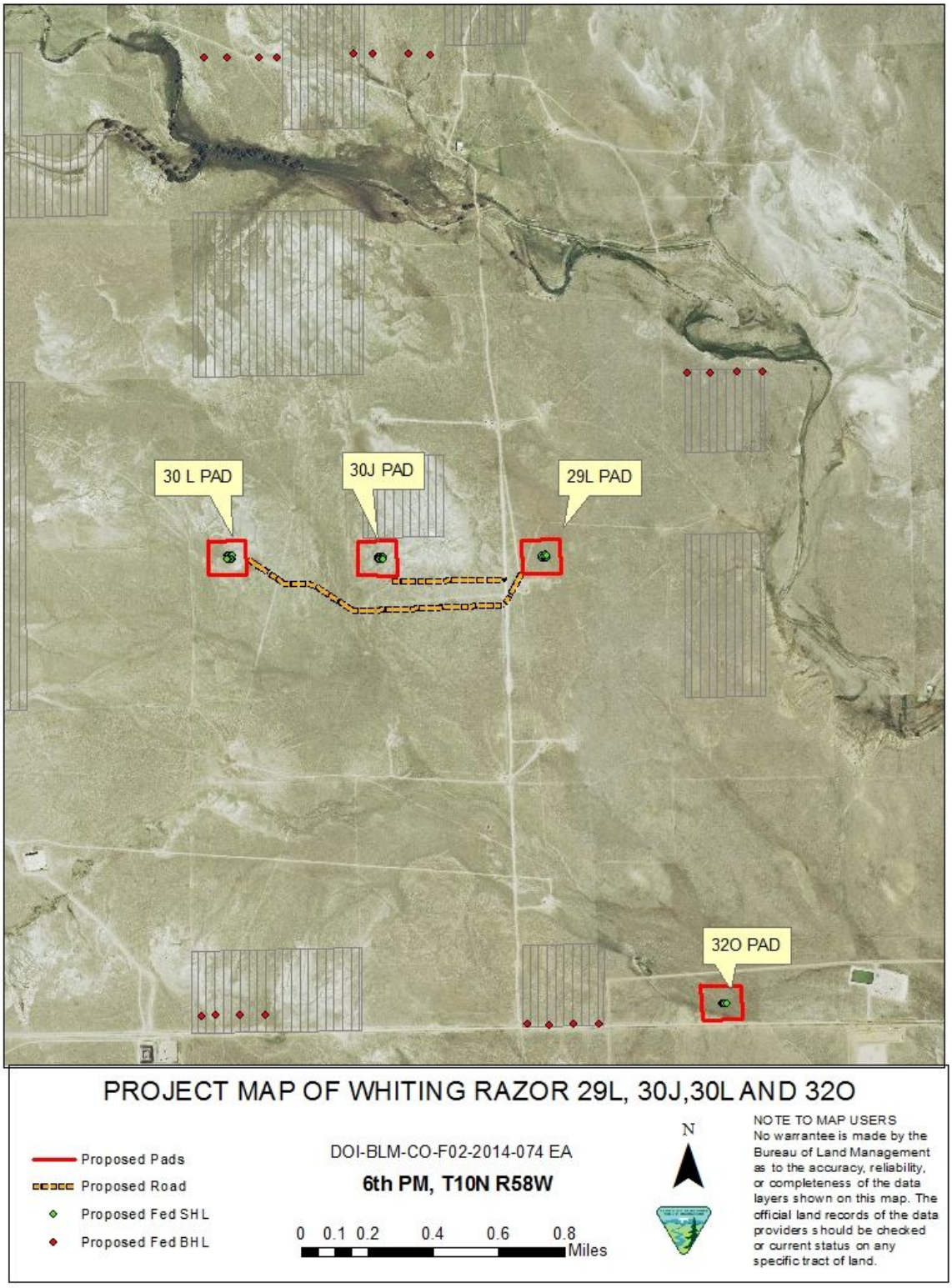
Figure 2.3.


30 L PAD
30J PAD
29L PAD
32O PAD
PROJECT MAP OF WHITING RAZOR 29L, 30J,30L AND 32O
Proposed Pads
Proposed Road
Proposed Fed SHL
Proposed Fed BHL
DOI-BLM-CO-F02-2014-074 EA
6th PM, T10N R58W
0 0.1 0.2 0.4 0.6 0.8
Miles
N
NOTE TO MAP USERS
No warrantee 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.

2.2.1. 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. The no action alternative constitutes denial of the APDs associated with the proposed action. In this case, all proposed surface activity takes place on private surface over private minerals, therefore, denial of the APDs will not prevent development of the private minerals, or any other surface activity associated with this project.

2.3. Alternatives Considered

2.3.1. 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 over private mineral estate.

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Chapter 3 Affected Environment and Effects

3.1. Introduction

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 impacted or potentially impacted will be brought forward for analysis.

Resource	Initial and date	Comment or Reason for Dismissal from Analysis
Air Quality Ty Webb, Chad Meister, Forrest Cook	FC, 12/3/2014	See Affected Environment
Geology/Minerals Stephanie Carter, Melissa Smeins	MJS, 11/04/ 2014	See Geology/Minerals Section 3.2.2
Soils John Smeins	JS, 10/23/14	See Soils Section 3.2.3
Water Quality Surface and Ground John Smeins	JS, 10/23/14	See Water Quality Section 3.2.4
Invasive Plants John Lamman	JL, 10/22/2014	See affected environment
T&E and Sensitive Species Matt Rustand	MR, 10/22/ 2014	See affected environment
Vegetation John Lamman	JL, 10/22/2014	See affected environment
Wetlands and Riparian Dave Gilbert	DG, 10/27/14	The proposed activity is within uplands.
Wildlife Aquatic Dave Gilbert	DG, 10/27/14	The proposed activity is within uplands.
Wildlife Terrestrial Matt Rustand	MR, 10/22/ 2014	See affected environment
Migratory Birds Matt Rustand	MR, 10/22/ 2014	See affected environment
Cultural Resources Monica Weimer	MMW, 10/22/14	No historic properties affected. See Section 3.4.1 for details.
Native American Religious Concerns Monica Weimer	MMW, 10/22/14	No concerns identified. See Section 3.4.2 for details.
Economics	AR 11/18/14	Economic impacts would be limited to a slight increase in royalties to the federal and state governments and severance taxes to local governments.

Paleontology Melissa Smeins, Stephanie Carter	MJS, 11/04/ 2014	See Paleontological Resources Section 3.4.3
Visual Resources Linda Skinner	LS, 10/23/ 2014	No public access or public surface present.
Environmental Justice Martin Weimer	mw, 10/28/14	The proposed action affects areas that are rural in nature. The land adjacent to these parcels is mixed short grass prairie and farmland, 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.
Wastes Hazardous or Solid Stephanie Carter	MJS, 11/04/ 2014	See Wastes, Hazardous or Solid section
Recreation Linda Skinner	LS, 10/23/ 2014	No public access or public surface present.
Farmlands Prime and Unique Jeff Williams, Chris Cloninger, John Lamman	JL, 10/22/2014	No Prime or Unique Farmlands
Lands and Realty Steve Craddock, Vera Matthews	AR 11/17/14	N/A, Private surface.
Wilderness, WSAs, ACECs, Wild & Scenic Rivers Linda Skinner	LS, 10/23/ 2014	No Wilderness, WSA, ACEC, or Wild &Scenic Rivers present
Wilderness Characteristics Linda Skinner	LS, 10/23/ 2014	No wilderness characteristics areas present.
Range Management John Lamman	JL, 10/22/2014	Surface estate is private
Forest Management Ken Reed	AR 11/17/14	N/A, private surface.
Cadastral Survey Jeff Covington	AR 11/17/14	Chain of Survey on file in project folder.
Noise Martin Weimer	mw, 10/28/14	The project area is located in farm and grasslands. Certain levels of noise are associated with drilling operations, these include drill rig operation, compressors/generators and general machine and vehicle operation. Such noises could have the effect of driving away wildlife. These impacts are temporary and terminate when drilling operations are complete.
Fire Ty Webb	AR 11/17/174	N/A, private surface.
Law Enforcement Steve Cunningham	mw for SC 10/28/14	There are no law enforcement issues associated with this action.

The affected resources brought forward for analysis include:

- Air Quality
- Geology/Minerals
- Soils
- Water Quality
- T&E and Sensitive Species
- Vegetation
- Wildlife Terrestrial
- Migratory Birds
- Cultural Resources
- Native American Religious Concerns
- Paleontology
- Wastes, Hazardous or Solid

3.2. Physical Resources

3.2.1. Air Quality and Climate

Affected Environment:

The U.S. Environmental Protection Agency (EPA), as directed by the Clean Air Act (CAA), has established national ambient air quality standards (NAAQS) 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 and 2.5 microns (PM10 and PM2.5, respectively), ozone (O3), and nitrogen dioxide (NO2). Please note that ozone is generally not directly emitted from sources, but is chemically formed in the atmosphere via interactions of oxides of nitrogen (NOX) and volatile organic compounds (VOCs) in the presence of sunlight and under certain meteorological conditions (NOX and VOCs are ozone precursors). Exposure to air pollutant concentrations greater than the NAAQS has been shown to have a detrimental impact on human health and the environment. 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 hospital admissions are evaluated, and can revise any NAAQS if the data supports a revision. The current NAAQS levels are shown in Table 3-1 below. Ambient air quality standards must not be exceeded in areas where the general public has access.

The CAA established two types of NAAQS:

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

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

In addition to the criteria pollutants, regulations also exist to control the release of hazardous air pollutants (HAPs). HAPs are chemicals that are known or suspected to cause cancer or other serious health effects, such as reproductive effects or birth defects, or adverse environmental effects. EPA currently lists 188 identified compounds as hazardous air pollutants, some of which can be emitted from oil and gas development operations, such as benzene, toluene, and formaldehyde. Ambient air quality standards for HAPs do not exist; rather these emissions are regulated by the source type, or specific industrial sector responsible for the emissions.

The EPA has delegated regulation of air quality to the State of Colorado (for approved State Implementation Plan (SIP) elements). The Colorado Department of Public Health and Environment (CDPHE), Air Pollution Control Division (APCD) administers Colorado's air quality control programs, and is responsible for enforcing the state's air pollution laws.

The CAA and the Federal Land Policy and Management Act of 1976 (FLPMA) require the BLM to ensure actions taken by the agency comply or provide for compliance 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)].

Pollutant [final rule citation]		Standard Type	Averaging Period	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/m3	Not to be exceeded
Nitrogen Dioxide [75 FR 6474, Feb 9, 2010]		Primary	1-hour	100 ppb	98th percentile, averaged over 3 years
[61 FR 52852, Oct 8, 1996]		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
Particulate Matter [73 FR 3086, Jan 15, 2013]	PM2.5	Primary	Annual	12 µg/m3	Annual mean, averaged over 3 years
		Secondary	Annual	15 µg/m3	Annual mean, averaged over 3 years
		Primary and secondary	24-hour	35 µg/m3	98th percentile, averaged over 3 years
	PM10	Primary and secondary	24-hour	150 µg/m3	Not to be exceeded more than once per year on average over 3 years
Sulfur Dioxide [75 FR 35520, Jun 22, 2010]		Primary	1-hour	75 ppb	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years
Colorado (State Only)		Primary and Secondary	3-hour	267 ppb	Not to be exceeded in any 12 month period
[38 FR 25678, Sept 14, 1973]		Secondary	3-hour	0.5 ppm	Not to be exceeded more than once per year

Source: National – 40 CFR 50, Colorado – 5 CCR 1001-14.

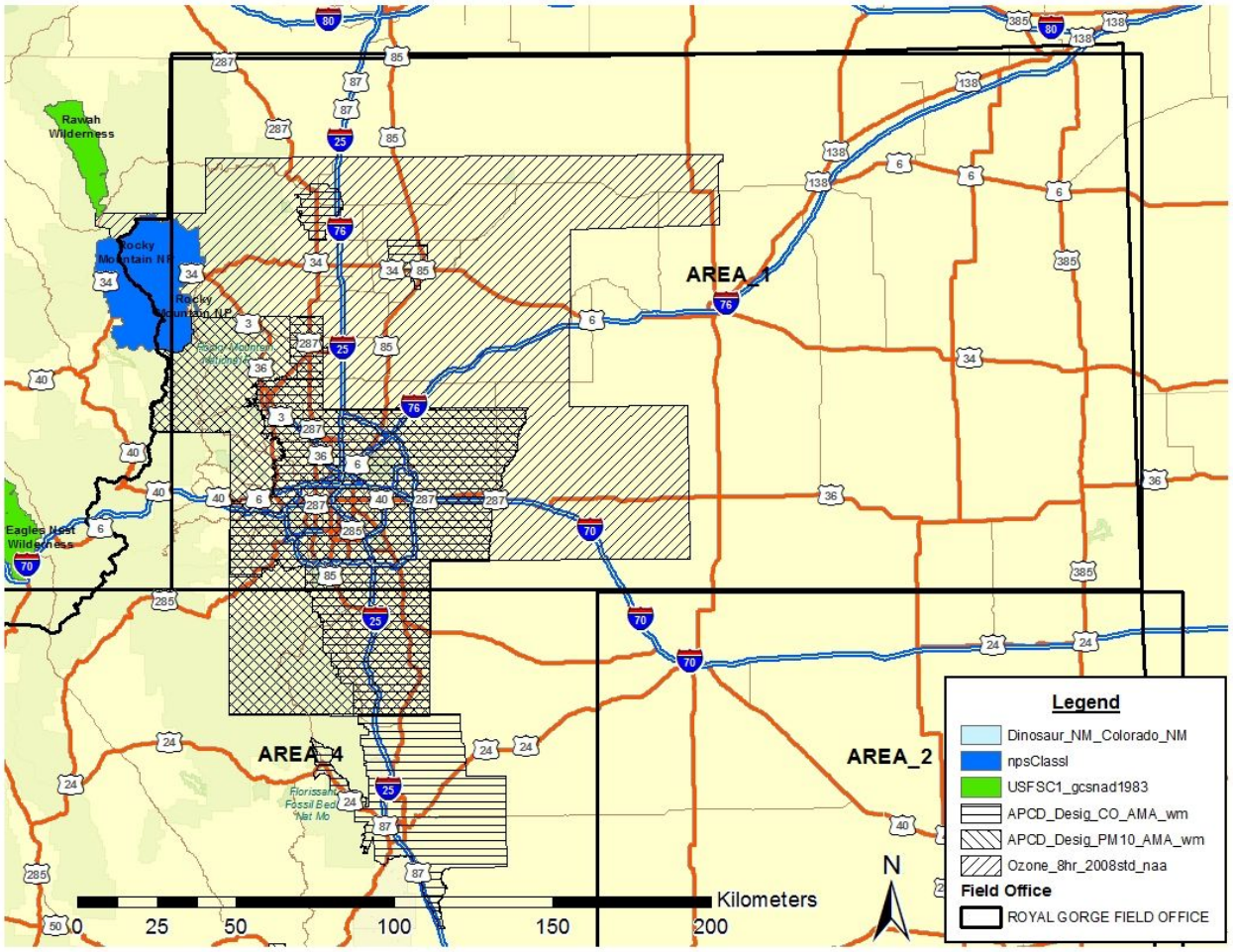
µg/m3 = micrograms per cubic meter, ppb = parts per billion, ppm = parts per million.

Figure 3.1.

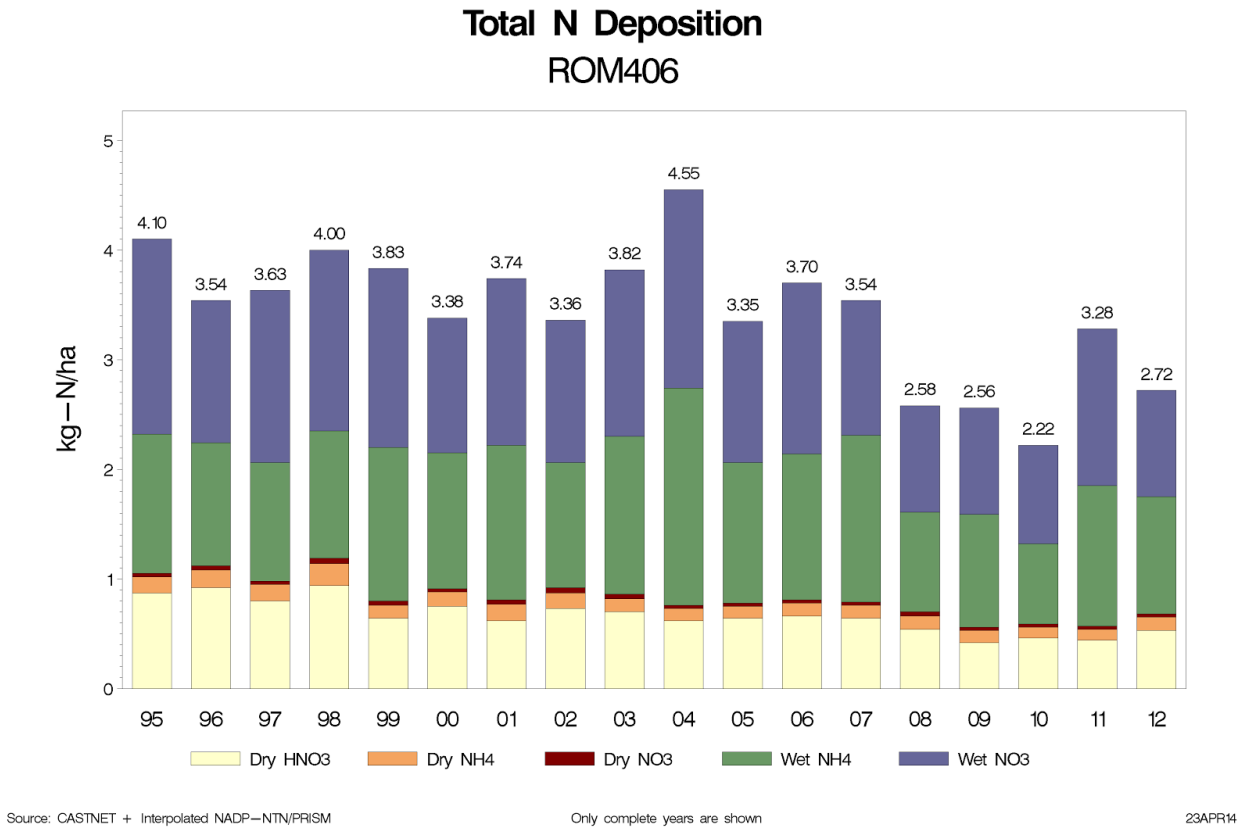
Existing Regional Air Quality

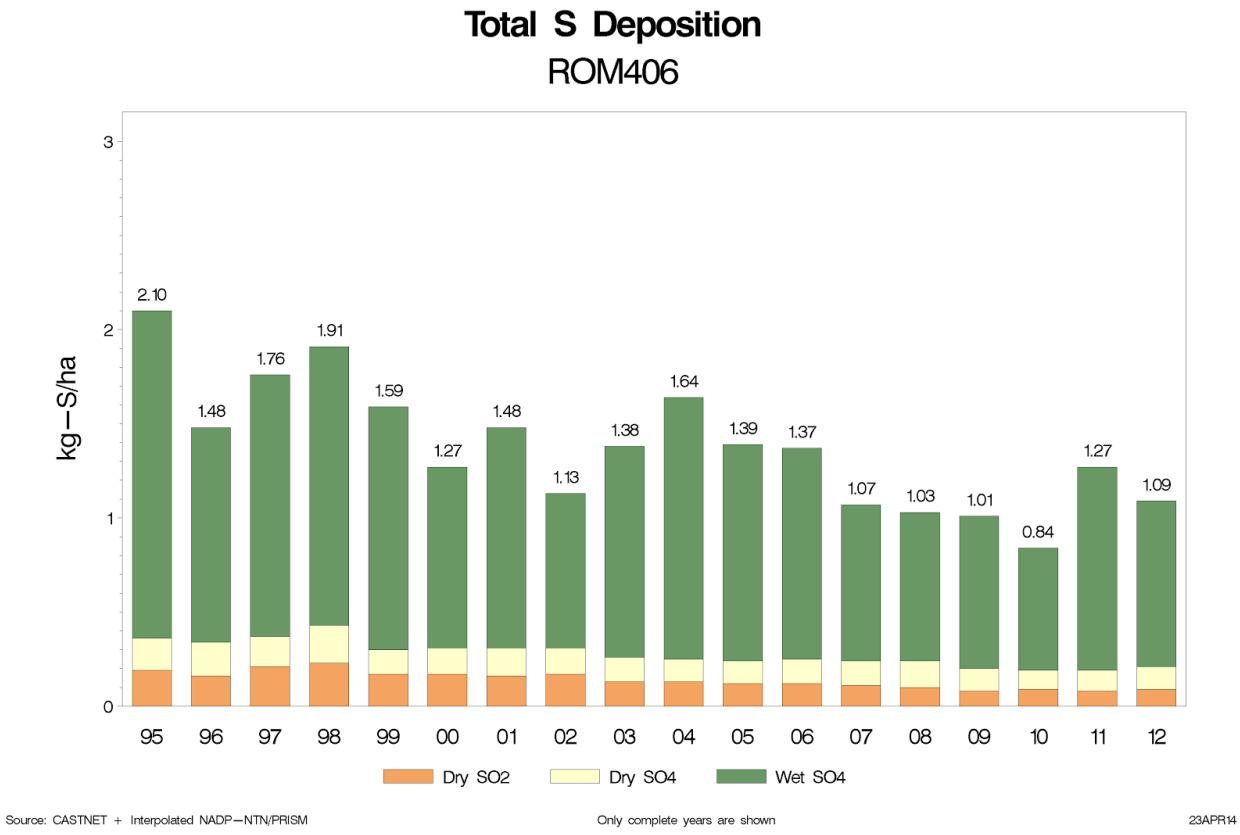
Air quality for any area is generally influenced by the amount of pollutants that are released within the vicinity and up wind of that area, and can be highly dependent upon the contaminants chemical and physical properties. Additionally, an area's topography or terrain (such as mountains and valleys) and weather (such as wind, temperature, air turbulence, air pressure, rainfall, and cloud cover) will have a direct bearing on how pollutants accumulate or disperse. Ambient air quality in the affected environment (i.e. compliance with the NAAQS) is demonstrated by monitoring for ground level atmospheric air pollutant concentrations. The APCD monitors ambient air quality at a number of locations throughout the state. The data is summarized by monitoring regions and CDPHE prepares an annual report (Annual Air Quality Reports) to inform the public about air quality trends within these regions. Similarly, several Federal Land Managers (FLMs) like the BLM, FS, and NPS, also monitor air quality for NAAQS and Air Quality Related Values (AQRVs) to meet organic act requirements. Table 3-2 below presents three years of monitoring data for criteria pollutants for northeastern Colorado RGFO counties near the proposed Project area (or adjacent / representative county monitors where no monitoring exists in the RGFO proposed Project area). The maximum monitoring value is presented where multiple monitors exist within a single county that monitor for the same pollutant. Concentrations are in units of the standards form (see the "Level" column in Table 3-1 above), with the exception of the ozone data, which is shown as the 4th highest 8-hour average. To compute the ozone design value (3 year average of the 4th highest 8-hour max), sum all three years of data (if available) and divide by three.

Figure 3-1 Field Office and Designated Air Boundaries



AQRVs are metrics for atmospheric phenomenon like visibility and deposition impacts that may adversely affect specific scenic, cultural, biological, physical, ecological, or recreational resources. Visibility changes can occur when excessive pollutant contaminates (mostly fine particles) scatter light such that the background scenery becomes hazy. Deposition can cause excess nutrient loading in native soils and acidification of the landscape, which can lead to declining buffering capacity changes in sensitive stream and lake water chemistries (commonly referred to as acid neutralization change (ANC)). Air pollutants are deposited by wet deposition (precipitation) and dry deposition (gravitational settling). The chemical components of wet deposition include sulfate (SO4), nitrate (NO3), and ammonium (NH4); the chemical components of dry deposition include sulfate, sulfur dioxide (SO2), nitrogen oxides (NOX), nitrate, ammonium, and nitric acid (HNO3). A recent 2014 NPS Study suggests that the critical nitrogen load value for high elevation surface water in all natural areas of Colorado is 2.3 kg/ha-yr. The NPS *Technical Guidance on Assessing Impacts on Air Quality in NEPA and Planning Documents* suggests that critical sulfur load values above 3 kg/ha-yr may result in moderate impacts. AQRVs are important to FLMs because they have a mandate to ensure their Class I and sensitive Class II areas meet scientific (landscape nutrient loading) and congressionally mandated goals (i.e. regional haze). Class I areas are generally pristine landscapes such as national parks, national forests, and wilderness areas that are specifically provided the highest levels of air quality protection under the CAA. Sensitive Class II areas are usually afforded additional protection under state specific rule making for one or more pollutants. This status elevates them above ordinary Class II areas which account for every other area of the country that is not explicitly designated as Class I or Sensitive Class II.


Total N Deposition
ROM406
kg−N/ha
0
1
2
3
4
5
4.10
3.54
3.63
4.00
3.83
3.38
3.74
3.36
3.82
4.55
3.35
3.70
3.54
2.58
2.56
2.22
3.28
2.72
95 96 97 98 99 00 01 02 03 04 05 06 07 08 09 10 11 12
Dry HNO3
Dry NH4
Dry NO3
Wet NH4
Wet NO3
Source: CASTNET + Interpolated NADP−NTN/PRISM
Only complete years are shown
23APR14


Total S Deposition
ROM406
kg−S/ha
0
1
2
3
2.10
1.48
1.76
1.91
1.59
1.27
1.48
1.13
1.38
1.64
1.39
1.37
1.07
1.03
1.01
0.84
1.27
1.09
95 96 97 98 99 00 01 02 03 04 05 06 07 08 09 10 11 12
Dry SO2
Dry SO4
Wet SO4
Source: CASTNET + Interpolated NADP−NTN/PRISM
Only complete years are shown
23APR14

Greenhouse Gases and Climate Change

There is broad scientific consensus that humans are changing the chemical composition of Earth's atmosphere. Activities such as fossil fuel combustion, deforestation, and other changes in land use are resulting in the accumulation of trace greenhouse gases (GHGs) such as carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), and several industrial gases in the Earth's atmosphere. An increase in GHG emissions is said to result in an increase in the earth's average surface temperature, primarily by trapping and thus decreasing the amount of heat energy radiated by the Earth back into space. The phenomenon is commonly referred to as global warming. Global warming is expected in turn, to affect weather patterns, average sea level, ocean acidification, chemical reaction rates, and precipitation rates, which is collectively referred to as climate change. The Intergovernmental Panel on Climate Change (IPCC) has predicted that the average global temperature rise between 1990 and 2100 could be as great as 5.8°C (10.4°F), which could have massive deleterious impacts on the natural and human environments. Although GHG levels have varied for millennia (along with corresponding variations in climatic conditions), industrialization and the burning of fossil carbon fuel sources have caused GHG concentrations to increase measurably, from approximately 280 ppm in 1750 to 400 ppm in 2014 (as of April). The rate of change has also been increasing as more industrialization and population growth is occurring around the globe. This fact is demonstrated by data from the Mauna Loa CO2 monitor in Hawaii that documents atmospheric concentrations of CO2 going back to 1960, at which point the average annual CO2 concentration was recorded at approximately 317 ppm. The record shows that approximately 70% of the increases in atmospheric CO2 concentration since pre-industrial times occurred within the last 54 years.

National Emissions Inventory Data (2011)

As previously stated, air quality is generally a function of air pollutants emissions loading within any particular region. With respect to the proposed project county and nearby counties (Adams, Arapahoe, Logan, Morgan and Weld in northeast Colorado), the following emissions inventories are provided to describe the affected environment in terms of current cumulative emissions intensities.

Project Area County Oil and Gas Production

The table below shows the current oil and gas production statistics on a per county basis (well counts and production numbers are for both federal and fee minerals) for the county containing the proposed project O&G development and nearby counties: Adams, Arapahoe, Logan, Morgan and Weld. The oil and gas data is from the Colorado Oil and Gas Conservation Commission (COGCC) database and is provided to convey the current level of intensity for oil and gas development within the vicinity of the proposed project.

Table 3-3 Project Area County Annual Production Data (2013)

Table 3-3 Project Area County Annual Production Data (2013)

County	Max County Producing Wells	County Annual Oil Prod. (bbl)	County Annual Gas Prod. (Mcf)	County Annual H2O Prod. (bbl)
Adams	1,159	30,589	394,326	45,543
Arapahoe	156	23,406	52,337	40,798
Logan	188	17,359	33,023	5,657,714

Morgan	213	10,206	28,935	251,536
Weld	25,168	4,383,682	25,426,741	1,415,300

National Emissions Inventory Data (2011)

As previously stated, air quality is generally a function of air pollutants emissions loading within any particular region. With respect to the proposed project county and nearby counties (Adams, Arapahoe, Logan, Morgan and Weld in northeast Colorado), the following emissions inventories are provided to describe the affected environment in terms of current cumulative emissions intensities.

Table 3-4 2011 County NEI Data (tons)

County	PM**10**	PM**2.5**	VOC	CO	NO**X**	SO**2**	CO**2**	CH**4**	N**2**O	NH**3**	H
Adams	14,055	4,346	21,395	72,900	24330	8,033	2,669,518	261	94	1,346	5
Arapahoe	13,296	3,350	17,861	85,894	11876	207	2,692,975	217	99	632	5
Logan	7,659	1,719	11,568	8,737	4052	101	212,893	24	5	4,518	2
Morgan	6,564	1,622	10,861	11,648	7650	13,082	274,751	61	8	5,410	2
Weld	27,960	6,194	137,717	68,222	25663	575	1,782,317	266	59	16,080	7

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 disturbances, 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. Most operations will be subject to some portions of the pollution control regulations currently on the books, and thus the proponent may have control equipment installed at the site to mitigate some or all of the expected fugitive emissions from flashing, load-outs, and leaks. Some control equipment, such as flares, will produce emissions of criteria, HAP, and GHG emissions via combustion.

As previously stated, ozone is not directly emitted like other criteria pollutants. Ozone formation and prediction is complex, generally results from a combination of significant quantities of VOCs and NOX 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 project on potential regional ozone formation and transport. However, BLM Colorado is performing a regional modeling study to assess potential ozone formation and impacts on a cumulative basis (see cumulative impacts for discussion).

Emission estimates for activities associated with the proposed action 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, NOX (includes NO2), PM2.5, PM10, SO2, VOCs, HAPs, CO2, CH4, and N2O. The EI was developed using reasonable but conservative scenarios for each construction and production activity. Production emissions were calculated for an entire year, and included activities that are not likely to occur every year (i.e. workovers and recompletions), thus the project inventory is conservative on an annualized basis. Potential emissions were calculated for each new project well assuming the minimum/basic legally required emissions control measures, common industry practices (as provided by oil and gas operators in the region), and any equipment configuration data that was provided by the proposed action proponent. Maximum foreseeable direct and indirect emissions would occur at the beginning of the project during the construction phase. It is assumed that production would not begin until all of the wells are completed and all of the necessary infrastructure and site equipment connections are made (i.e. individual wells will not be brought online while completion and testing activities are still occurring at the site).

The following assumptions were applied consistently to all potential activities associated with the proposed action for developing a project-specific emissions inventory:

- The emissions estimated for construction activities are based on the disturbed surface area of ~ 10 acres as described in the proposed action for well pad, access roads, initial reclamation acres, and any pipeline infrastructure.

- Construction is projected to last approximately 12 months (based on an estimated 19 days for construction / development activities per well).

- The emissions inventory calculations assume that all disturbed surfaces (pads and access roads) would receive appropriate application of water during construction phase and emissions calculations (~ 50% dust control efficiency).

- Production phase equipment would include storage tanks, pneumatics, separation equipment, artificial lift engines. The emissions inventory assumes no well-head compression, dehydration, or sweetening units for the project. Tank flashing emissions (VOCs) are assumed controlled to 95%. Emissions calculations for pneumatic devices assume low-bleed rate devices (6cfh max). Artificial lift engines are expected to be powered by electricity based on operator provided information.

- Completion flaring would be limited due to the implementation of green completions.

- Drill rigs, completion and fracing engines related emissions are calculated assuming use of duel fuel version engines (information provided by operator). The diesel combustion emissions portion is based on EPA Non-road Tier 2 emissions standards and emissions for the natural gas fired engine portion are calculated using EPA AP-42 emissions factors.

- The emissions inventory uses a northeast Colorado representative natural gas analysis to estimate VOC and HAP speciation percentages. Assumed fractional % of VOC was HAP for modeling analysis.

- Fugitive well emissions are based on northern Colorado oil and gas operator provided well component counts.

- For the emissions inventory and modeling assessment, conservatively assumes that all operations / activities and production are Federal even though a large portion of the production will be associated with Fee minerals.

Table 3-5 Annual Emissions Inventory for Project (Tons)

Maximum Annual Project Emissions (tons)

Activity	Criteria Pollutants						GHGs				HAPs
Construction	PM10	PM2.5	VOC	NOx	CO	SO2	CO2	CH4	N2O	CO2eq	All
Construction Activities	2.38	0.45	0.07	0.59	0.31	0.02	103.61	0	0	104.4	0
Rig & Drilling Ops	2.39	0.82	3.15	18.58	15.9	0.55	3308.77	252.63	49.91	24,085.44	0.28
Completion	13.38	2.66	2.51	43.42	28.18	1.53	5573.51	642.16	128.44	58,875.39	0
Initial Reclaimation	1.02	0.22	0.04	0.38	0.2	0.01	66.93	0	0	67.44	0
Sub-total: Construction	19.17	4.15	5.77	62.98	44.59	2.11	9,052.81	894.79	178.35	83,132.66	0.28
Operations											
Fugitive Dust	88.72	9.2	NA	NA	NA	NA	NA	NA	NA	NA	NA
On-Road Mobile	1.28	1.01	0.88	16.12	5.69	0.03	4484.68	0.11	0.01	4,489.76	0
Off-Road Mobile	0	0	0	0.02	0.01	0	2.86	0	0	2.89	0
Non-Road Portable	0.01	0.01	0.01	0.14	0.1	0	15.28	0.01	0	16.51	0
Tanks	NA	NA	18.37	NA	NA	NA	NA	0	NA	0	7.95
Tank (liquids) Loadouts	NA	NA	61.5	NA	NA	NA	NA	0	NA	0	0
Components	NA	NA	108.38	NA	NA	NA	10.73	124.46	NA	2,624.44	0.69
Pneumatic Devices	NA	NA	8.26	NA	NA	NA	1.29	14.92	NA	314.55	0.02
Heaters	0.39	0.39	0.28	5.09	4.27	0.03	6104.47	0.12	0.11	6,141.62	0
Stationary Engines / Pumps	0	0	0	0	0	0	0	0	0	0	0
Engine / Compression Start-up & Shutdown	NA	NA	0.1	NA	NA	NA	NA	0.18	NA	3.83	0
Dehydration Units	NA	NA	0	NA	NA	NA	NA	0	NA	0	0
Flares / Control Equipment	0	0	0	0	0	0	0	0	0	0	0
Blowdown Venting	NA	NA	14.15	NA	NA	NA	2.2	25.54	NA	538.61	0.03
Flares / Blowdowns	0	0	0	0	0	0	0	0	0	0	0
Workovers - Re-completions	6.68	1.32	1.25	21.61	13.52	0.76	2612.65	321.08	64.22	29,263.06	0
Flares / Workovers - Re-completions	0.02	0.02	0	0.21	1.14	0	348.2	0	0	349.28	0
Sub-total: Operations	97.08	11.96	213.19	43.18	24.73	0.83	13,582.36	486.43	64.35	43,744.54	8.69
Total Emissions	116.26	16.1	218.96	106.16	69.32	2.94	22,635.17	1,381.22	242.7	126,877.21	8.96

Notes:

Recompletion and workover activities are unlikely to occure in the first few years of production when other production based emissions (flashing, delay, loadouts, etc....) are at their highest, thus they are not included in the totals, but are presented for informational purposes only.

Protective/Mitigation Measures:

Multiple near-field modeling assessments (including application of BLM COSO near-field impacts screening tool as described earlier) performed by the BLM Colorado for Colorado-based oil and gas air quality assessments indicate that routine water (or product with equivalent dust control efficiency) 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 weeks. 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 construction activities emissions not controlled. In addition, multiple Colorado-based near-field modeling assessments for oil and gas development suggest that drill rig, fracing and completion related engines should meet EPA Non-Road Tier II emissions standards (at a minimum) in order to achieve compliance with short-term NO2 air quality standards.

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:

Applicant will continuously apply water or dust-suppressant to public unpaved surfaces that access the new well pad / facility likely to be disturbed during construction / well development phase and during operations / production phase during dry periods.

Project-Specific Near-Field Impacts Analysis

A project-specific near-field air quality impacts analysis was conducted using AERMOD to show that near-field air quality impacts for the proposed project are acceptable (below AAQS and other applicable thresholds). See Appendix A for near-field modeling report.

The proposed action, when combined with the past, present, and reasonably foreseeable future actions may contribute incrementally to the deterioration of air quality in the region. Development of fluid minerals at the rate proposed within the APDs would result in additional surface and subsurface disturbances and emissions during construction, drilling, completion, and production activities. The severity of these incremental impacts could be elevated based on the amount of contemporaneous development (either federal or private) in surrounding areas.

In consideration of disclosing cumulative and regional air quality impacts, the BLM has initiated the Colorado Air Resources Management Modeling Study (CARMMS). The study includes assessing statewide impacts of projected oil and gas development (both federal and fee (i.e. private)) out to year 2021 for three development scenarios (low, medium, and high). Projections for development are based on either the most recent FO Reasonably Foreseeable Development (RFD) document (high), or by projecting the current 5-year average development paces forward to 2021 (low). The medium scenario included the same well count projections as the high, but assumed restricted emissions, where the high assumed current development practices and "on the books" emissions controls and regulations (2012). Each FO was modeled with the source apportionment option, meaning that incremental impacts to regional ozone and AQRVs from Federal oil and gas development in these areas are essentially tracked to better understand the significance of such development on impacted resources and populations. The CARMMS project leverages the work completed by the WestJumpAQMS, and the base model platform and model performance metrics are based on those products (2008).

Based on the CARMMS projections, the BLM continually tracks emissions changes and air quality conditions to determine which projection path (low , medium, high) would be most appropriate to estimate air quality impact correlations based on the cumulative development (i.e. net emissions changes) that has occurred since the base emissions inventory year (2008). Although the predicted impacts will be based on future modeling results (2021), the relative changes in the impacts between the scenarios will provide insight into in understanding how mass emissions impact the atmosphere on a relative basis.

For the CARMMS, the RGFO was broken into 4 geographic areas due to the overall size and diversity of the RGFO. Figure 3-1 shows the northern RGFO Area #1 for CARMMS and the proposed Project would be approximately in the middle of this CARMMS source apportionment area. In addition, the RGFO Area #1 is further broken into two source apportionment modeling areas for CARMMS: within Pawnee National Grasslands (PNG) boundary and outside PNG boundary. The proposed Project is located within the PNG boundary of RGFO Area #1.

CARMMS O&G Development and Emissions Tables

The following Table provides the RGFO Area # 1 oil and gas development and projected production rates modeled for the CARMMS RFD (High) and 5-year Average (Low) modeling scenarios (includes all development within PNG and outside PNG boundary).

Table 3-6: CARMMS Future O&G Development / Projections Modeled – RGFO Area #1

Parameter	RFD (High) Scenario1	5-year Average (Low) Scenario2
Federal Wells Per Year	47 (470 in 10 years)	9 (100 in 10 years)
Cumulative (Fed and non-Fed) Wells Per Year	585	1,350
Wells Per Pad (assumed for analysis)	4	4
2021 Cumulative Active Well Counts	29,673	37,323
% 2021 Cumulative Wells that Are Federal	2%	1%
Cumulative Average Annual No. Drill Rigs Operating	32	74
Cumulative 2021 Gas Production (MMscf/yr)	514,165	800,374
Cumulative 2021 Oil / Condensate Production (Mbbl/yr)	163,744	341,476

Table 3-7: CARMMS Baseline and Projected Year 2021 Annual Emissions (TPY) – RGFO Area #1 Federal O&G (inside and outside of PNG boundary)

Field Office	PM10	PM2.5	NOX	VOC	CO	SO2
Baseline - 2011	10.5	3.9	140.2	666.4	115.2	0.6
RFD (High) Scenario - 2021	910.5	118.1	1229.7	2437.5	1091.6	4.6
Emissions Change (2021 minus 2011) – RFD Scenario	900.0	114.2	1089.5	1771.1	976.4	4.0
RFD (Low) Scenario - 2021	170.7	22.2	248.6	781.4	258.0	0.8
Emissions Change (2021 minus 2011) – Low Scenario	160.2	18.3	108.4	115.0	142.8	0.3

1 RFD based on O&G Industry and BLM Resource Specialists 20-year projections for the RGFO.

1 Future O&G development projections based on recent 5 years (2008-2012) of O&G development data for the RGFO.

The following Table provides baseline year 2011 and projected year 2021 Federal oil and gas emissions for the RGFO Area #1. The emissions changes (as shown) from baseline year 2011 to year 2021 is reflective of the CARMMS 10-year emissions change for RGFO Area #1 Federal O&G development and production for both (High and Low) CARMMS modeling scenarios.

The CARMMS incremental modeling changes / results (year 2021 minus year 2011) for each source group (i.e. RGFO Area #1) are applicable for the amount of additional air pollutant emissions that were modeled in the Study. Annual oil and gas completions / development inventories (post year 2011) are routinely compiled by the BLM to ensure that current and future oil and gas development does not exceed the acceptable "budgets" (O&G development / emissions rates) as modeled in CARMMS. As of August, 2014, approximately 31 new Federal O&G wells have been completed for the entire RGFO (most wells are located in Area #1) since year 2011 (approximately 10 new Federal wells per year). This annual development rate is much lower than the ~ 47 new Federal wells per year for RGFO Area #1 as modeled for CARMMS year 2021 RFD scenario (new development for years 2012 through 2021) and is currently tracking

very close to the ~ 9 new Federal wells per year (new O&G development for years 2012 through 2021) for RGFO Area #1 as modeled for the CARMMS "low" scenario.

As future oil and gas development occurs (including the proposed project) in the RGFO, project-specific emissions (based on approved APDs) are being added to the total regional emissions estimates (all emissions sources: oil and gas emissions and more) to compare regional emissions rates modeled in cumulative air quality modeling studies (CARMMS) along with the corresponding modeling results to confirm that activities approved by the BLM Colorado are within the modeled emissions analyzed in the cumulative analyses. The results and summaries of these annual analyses will be included in the BLM Colorado Air Resources annual reports (projected to begin year 2015 for calendar year 2014).

Based on the oil and gas development level analysis as described above and the information provided in Table 3-6, it is reasonable to conclude that current levels of RGFO Federal oil and gas development are tracking at (or near) CARMMS "low" levels. However, the modeling results for the CARMMS High scenario are being presented for assessing future potential regional / cumulative air quality impacts since RFD indicates that increased (more than current levels) annual Federal O&G development is likely to occur in RGFO Area #1, specifically the PNG area. The following sub-section provides CARMMS High scenario source apportionment modeling results for incremental RGFO Area #1 oil and gas development year 2012 through year 2021 within PNG.

CARMMS Modeling Results for High Scenario – RGFO Area #1 Federal O&G

As described above, the RFD forward projections (High) modeling scenario provides a look at impacts that would cover all potential oil and gas development using BLM O&G specialists and industry O&G development projection data. The following table provides a quasi-cumulative summary of ozone, visibility and nitrogen deposition impacts for all of the new (post-year 2011) projected RGFO Area #1 Federal oil and gas emissions within the PNG boundary (proposed Project is located within Pawnee National Grasslands boundary) associated with the High modeling scenario. These impacts show the relative contribution to full cumulative (all world-wide emissions sources) impacts for the new projected RGFO Area #1 oil and gas emissions (within Pawnee NG) associated with the High modeling scenario.

Table 3-8: CARMMS – RGFO Area #1 Federal O&G Contribution to Modeled Impacts

Source Group - Modeling Scenario	**Number of Annual Days Above 0.5 dv Change**	**Maximum Modeled Annual Nitrogen Deposition (kg/ha-yr)**	**Overall Maximum 4th High Daily 8-hour Ozone Contribution (ppb)**	**Maximum 4th High Daily 8-hour Ozone Contribution to Modeled Exceedance (ppb)**	Overall Maximum 8th High 24-hour PM**2.5** Contribution (ug/m**3**)
RGFO Area #1 within PNG – High Scenario - Year 2021	0	0.0017	0.5	0.03	0.6

* maximum modeled concentrations / values for any Class I / sensitive Class II area (AQRV) or grid cell (ozone).

As shown in the table above, there are no days that the projected new RGFO year 2021 Federal oil and gas emissions within PMG have a significant (~ 0.5 dv) visibility change impact at any Class I or sensitive Class II area and the maximum modeled nitrogen deposition contribution is below the Deposition Analysis Threshold (DAT) ~ 0.005 kg/ha-yr and minimal with respect to the cumulative critical nitrogen deposition load of 2.3 kg/ha-yr value. The maximum contributions

to 4th high daily maximum 8-hour ozone concentrations are minimal with respect to the 75 ppb 8-hour ozone standard and the maximum contribution to the 8th high maximum 24-hour PM2.5 concentration is minimal with respect to the 35 ug/m3 24-hour PM2.5 standard.

The information above shows that the predicted air quality impact contributions associated with the CARMMS RFD High oil and gas development scenario for the RGFO Area #1 within PNG are minimal, and it is reasonable to conclude that project-level O&G development (based on actual development plans) would have even lower contributions to the overall cumulative air quality.

CARMMS Modeling Results – Full Cumulative

Even though current oil and gas development rates are tracking at or below CARMMS Low modeling scenario oil and gas development projections (new O&G development for years 2012 through 2021) for all or most of the BLM Colorado planning areas / Field Offices, the CARMMS High modeling scenario results are being reported for cumulative air quality impacts in order to be consistent with the CARMMS RGFO Area #1 – PNG specific impacts discussion. It's important to note that all other emissions sources (other than new Colorado –based O&G) were modeled at the same rates for the CARMMS High and Low scenarios (the new Colorado O&G were only source category with varying development / emissions rates for the different CARMMS modeling scenarios).

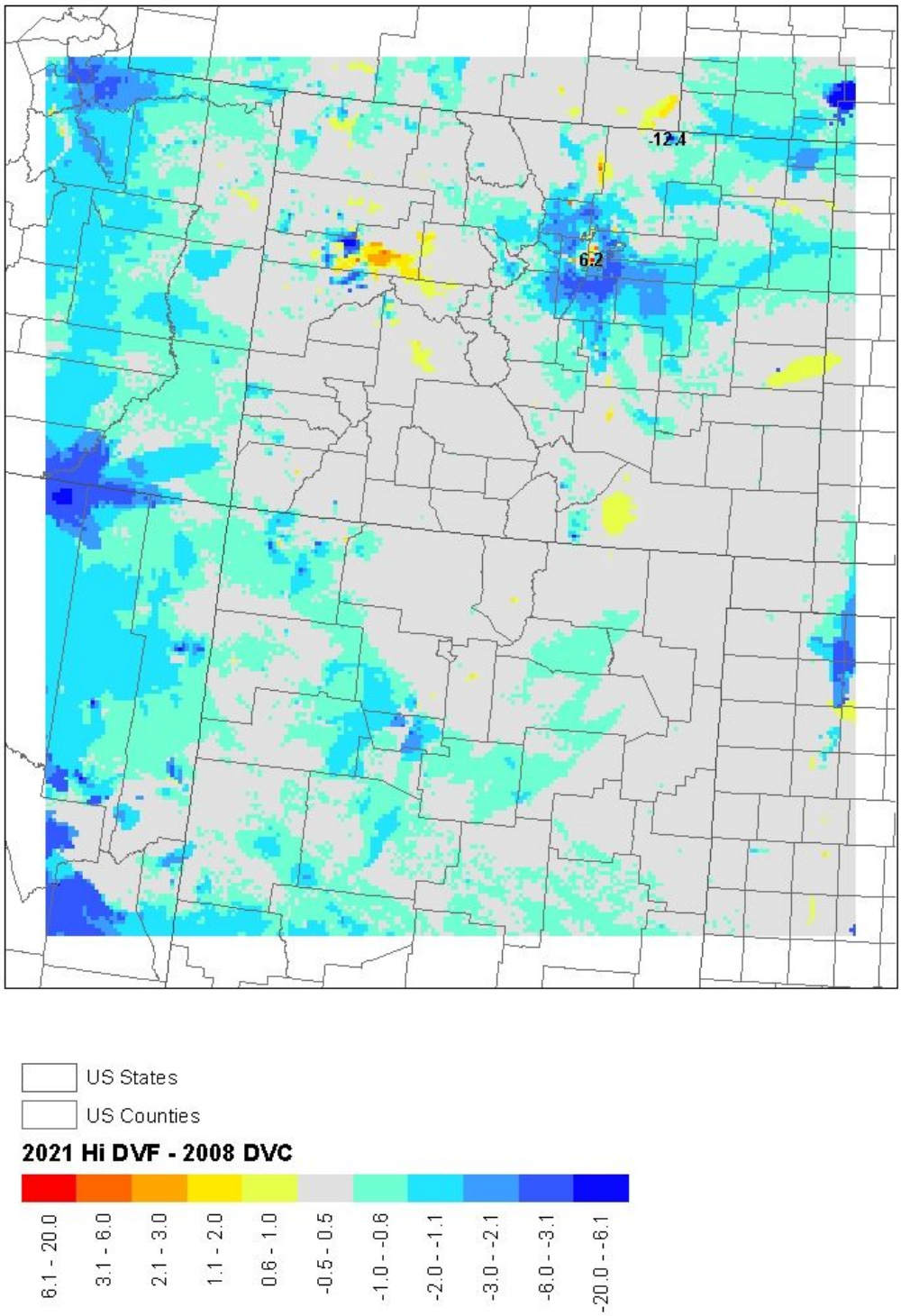
The following table provides a full cumulative summary of ozone, visibility and nitrogen deposition impacts for all (i.e. world-wide) emissions sources associated with the CARMMS High modeling scenario.

Table 3-9: CARMMS Modeled AQRV Impacts - High 2021 Scenario - Full Cumulative Emissions Inventory

Class I Area	Best 20% Days Visibility Metric (dv) - 2021 High Improvement from 2008	Worst 20% Days Visibility Metric (dv) - 2021 High Improvement from 2008	Maximum Modeled Annual Nitrogen Deposition (kg/ha-yr) – 2021 High Improvement from 2008
Rocky Mtn. National Park	0.04	0.89	1.08

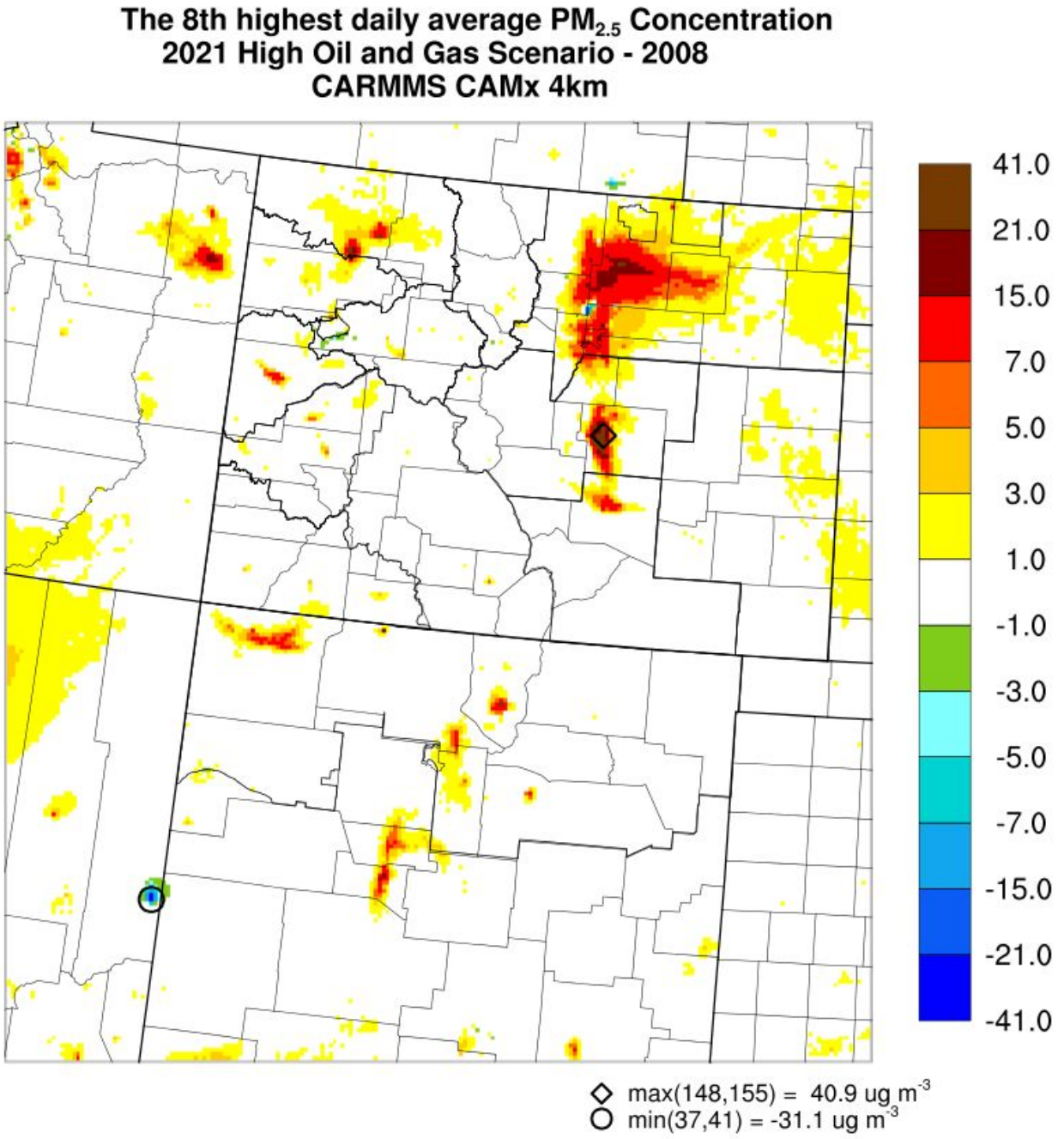
* positive values mean overall improvement and deposition values are maximum for all grid cells making up the Class I area.

For full cumulative ozone design value projections at regional ozone monitoring sites, the maximum current year 8-hour ozone design concentration (DVC; based on 2006-2010 observations) is 82.0 ppb at the Rocky Flats North (CO_Jefferson_006) monitor that is projected to be reduced to 79.5 ppb for the CARMMS 2021 Low Development Scenario. There are eight monitoring sites in the CARMMS 4 km domain with current year DVCs above the ozone NAAQS that are reduced to two sites in the 2021 High Scenario, Rocky Flats North and Fort Collins West (CO_Larimer_0011).



The following CARMMS plot shows changes in 8th highest daily average PM2.5 concentrations (2021 High Scenario minus Base Year 2008 concentrations). As shown in the figure,

concentrations are expected to increase in major Colorado Front Range cities and near mining operations in Colorado



With the exception of PM2.5 concentrations near large cities, future mining operations and non-Federal O&G operations, the CARMMS High Scenario full cumulative modeling results show an overall improvement to air quality in the region from year 2008 to year 2021.

Greenhouse Gases and Climate Change

The implementation of the proposed action is estimated to contribute 83,133 metric tons of carbon dioxide equivalent (CO2(e)) in the maximum year (construction / development year). Annual operating GHG emissions will be ~ 53% as much emissions as shown for the construction / development year (see Table 3-5). Over a 25 year timeframe, the total GHG emissions expected are approximately 1,133,002 metric tons CO2(e) for the 19 new wells. The total emissions provided do not account for the ultimate use or consumption of any produced minerals at this time due to the fact that the ultimate form of use and any additional processing required creating the product to sufficient quality (which could cause changes to the quantity of product) cannot be predicted with any reasonable certainty. Additionally, it should be noted that production values (also estimated at this time) could vary significantly over the life of the project, making any prediction of the quantities of GHG emitted highly speculative.

The CDPHE used the EPA's State Inventory Tool to estimate future years GHG emissions inventories for Colorado. In year 2020, it is estimated that Colorado's annual GHG emissions will be approximately 126,060,000 metric tons CO2(e). The proposed action annual production phase (post-development) GHG emissions would represent about 0.03 % of the state of Colorado's year 2020 annual GHG emissions. Given the relative magnitude of greenhouse gas emissions associated with the development of the 19 wells as compared to the state's GHG emission levels, the GHG contribution associated with the wells is extremely small.

To provide additional context, the EPA has recently modeled global climate change impacts from a model source emitting 20% more GHGs than a 1500MW coal-fired steam electric generating plant (approx. 14,132,586 metric tons per year of CO2, 273.6 metric tons per year of nitrous oxide, and 136.8 metric tons per year of methane). It estimated a hypothetical maximum mean global temperature value increase resulting from such a project. The results ranged from 0.00022 and 0.00035 degrees Celsius occurring approximately 50 years after the facility begins operation. The modeled changes are extremely small, and any downsizing of these results from the global scale would produce greater uncertainty in the predictions. The EPA concluded that even assuming such an increase in temperature could be downscaled to a particular location, it "would be too small to physically measure or detect", see Letter from Robert J. Meyers, Principal Deputy Assistant Administrator, Office of Air and Radiation re: "Endangered Species Act and GHG Emitting Activities (Oct. 3, 2008). The project emissions are a fraction of the EPAs modeled source and are shorter in duration, and therefore reasonable to conclude that the project would have no measurable impact on the climate.

No Action Alternative:

Direct and Indirect Impacts:

Under the No Action Alternative, the BLM would not authorize any of the Proposed Action elements. However, because the project sites are privately owned surface, the same well construction and operation could occur as under the Proposed Action, provided that the wells were drilled or completed such that they would not produce or drain federally-owned oil and gas. Consequently, the air quality and GHG impacts described above (Environmental Consequences for APD Approval) for the Proposed Action could occur, except that drilling emissions under the No Action Alternative might be slightly less if avoidance of federally-owned oil and gas necessitates shorter well shafts. As a result, the air quality impacts associated with No Action Alternative would be essentially very similar as those disclosed for the Proposed Action – APD Approval.

Protective/Mitigation Measures:

None

Cumulative Impacts:

May be similar to Proposed Action.

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.

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.

Cumulative Impacts:

Cumulative impacts on geology and minerals resources would primarily occur as a result of development, which would irreversibly deplete recoverable hydrocarbons from the producing formation.

No Action Alternative:

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.

Direct and Indirect Impacts:

May be similar to proposed action.

Protective/Mitigation Measures:

None

Cumulative Impacts:

May be similar to proposed action

3.2.3. Soils

Affected Environment:

Razor 29L Pad

The proposed pad is on the Kim-Mitchell complex, 0 to 6 percent slopes. The soil is derived from calcareous loamy alluvium, with root restrictive layers being greater than 80 inches deep. The calcium carbonate maximum in profile is 15 percent. The natural drainage class is well drained, with low runoff potential and no frequency of ponding. This soil does not meet hydric criteria. The Kim-Mitchell complex is in the Loamy plains (R067BY002CO) Ecological site, and is of local farmland importance.

Razor 30J Pad

A 1.7 acre band on the western edge of the proposed pad is on the Kim-Mitchell complex, with details the same as the Razor 29L pad. The remaining 6 acres are on Epping silt loam, 0 to 9 percent slopes. The soil is derived from calcareous loamy residuum weathered from siltstone, with root restrictive layers 10 to 20 inches to paralithic bedrock. The calcium carbonate maximum in profile is 15 percent. The natural drainage class is well drained, with medium runoff potential and no frequency of ponding. The Epping silt loam is in the Shallow siltstone (R067BY039CO) Ecological site.

Razor 30L Pad

The proposed pad is on the Epping silt loam, 0 to 9 percent slopes, with details the same as described in the Razor 30J Pad.

Razor 32O Pad

A 1.4 acre band on the southern edge of the proposed pad is on the Shingle clay loam, 0 to 9 percent slopes. The soil is derived from calcareous, clayey loamy residuum weathered from shale, with root restrictive layers at 10 to 20 inches to paralithic bedrock. The calcium carbonate maximum in profile is 15 percent. The natural drainage class is well drained, with medium runoff potential and no frequency of ponding. The Shingle clay loam is in the Shaly Plains (R067BY045CO) Ecological site, and is not of local farmland importance.

The remaining 6.8 acres in the northern 80 percent of the pad are on the Haverson loam, 0 to 3 percent slopes. The soil is derived from stratified, calcareous loamy alluvium, with root restrictive layers at more than 80 inches deep. The calcium carbonate maximum in profile is 15 percent. The natural drainage class is well drained, with low runoff potential and no frequency of ponding. The Shingle clay loam is in the Overflow (R067BY036CO) Ecological site, and is of prime farmland importance if irrigated and protected from flooding.

Access Roads

The access roads outlined in the Proposed Action cross the Kim-Mitchell complex and Haverson loam soils as described in the pads sections.

Environmental Effects

Proposed Action:

Direct and Indirect Impacts:

The proposed pads would disturb 36 acres of land surface, and the access roads would disturb 1.25 additional acres. Post reclamation, 12 acres would remain disturbed for the pads and 1.25 for the access roads. 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, high infiltration rate of the native soils, and construction standards being proposed, impacts to soils off site would be minor.

Development of the pads 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. Continued monitoring and maintenance of the pads would be required to limit any further or unnecessary impacts to soil resources.

Protective/Mitigation Measures/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.

Cumulative Impacts:

The area around the proposed wells has a variety factors effecting soils including other wells, 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.

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:

None

Cumulative Impacts:

May be similar to Proposed Action

3.2.4. Hydrology/Water Quality

Surface, Groundwater, Floodplains

Affected Environment:

The proposed well pads would be located in a dry upland setting near the intermittent North Pawnee Creek, in the North Pawnee Creek watershed (011900140104). The three northern pads are located roughly within one mile from that creek. Annual rainfall is estimated between 11 and 17 inches per year. 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.

The Colorado Division of Water Resources CDSS interactive map shows several known groundwater wells within the area. However, based on cattle trailing and visible stock ponds seen in aerial photos it appears there may be more water wells than shown in the state records. Within a one mile radius of the proposed pads are the following groundwater wells:

Permit No.	PLSS	Depth [ft]	Owner
30L Pad			
7132	SENW, Section 31, T10N-R68W	195	Uhl, David E.
30J Pad			
7132	SENW, Section 31, T10N-R68W	195	Uhl, David E.
29L Pad			
N/A	N/A	N/A	N/A
32O Pad			
11436	SESW, Section 32, T10N-R68W	150	Larkins, Dick
279740	SWNW, Section 5, T9N-R68W	146	Timbro Ranch & Cattle Co LLC
115351	NWSW, Section 5, T9N-R68W	145	Timbro Ranch & Cattle Co LLC
277149	SWSW, Section 33, T10N-R68W	160	Rohn Robert

All wells are listed under an “ALL UNNAMED AQUIFERS” class.

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, 37.25 acres would be disturbed. 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 the APD 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.

Cumulative Impacts:

Most of the watershed is undeveloped other then oil and gas development. The other uses include agriculture and cattle grazing. With proper mitigation and protective measures, cumulative impacts to surrounding areas are expected to be minimal.

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

Cumulative Impacts:

May be similar to Proposed Action.

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 and crop agriculture 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. State law requires eradication of state listed A noxious weed species and control of state listed B noxious weed species throughout the life of the project.

Direct and Indirect Impacts:

Protective/Mitigation Measures: None

Cumulative Impacts: None

No Action Alternative:

Direct and Indirect Impacts: May be similar to Proposed Action

Protective/Mitigation Measures: None

Cumulative Impacts:

May be similar to Proposed Action

*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. Threatened, Endangered and Sensitive Species

Affected Environment:

The U.S. Fish and Wildlife Service (USFWS) lists threatened, endangered, and candidate species per the Endangered Species Act (ESA). The USFWS periodically posts a list of species having threatened (T), endangered (E), and candidate (C) status and with the potential to occur in the area. The USFWS 2012 list for Weld County includes Mexican spotted owl (T), piping plover (T), least tern (E), black-footed ferret (E), Preble's meadow jumping mouse (T), Ute ladies'-tresses orchid (T), and Colorado butterfly plant (T). There are no candidate species listed for Weld County.

Suitable habitat does not exist for the threatened and endangered species with the potential to occur in the project area. There is no suitable habitat in the project area for Mexican spotted owl, which resides in old growth or mature forests, nor is there any nearby water to support for piping plover or least tern. There is no suitable habitat for Preble's meadow jumping mouse and the two listed plants due to the lack of riparian and wetland communities within the Project Area. The U.S. Fish and Wildlife Service (USFWS), in coordination with the Colorado Parks and Wildlife, has block-cleared all black-tailed prairie dog habitat in eastern Colorado, including Weld County. They have determined that these areas no longer contain any wild free-ranging black-footed ferrets.

Mountain plover is listed as a Bureau of Land Management sensitive species in the state of Colorado. Mountain plovers are a migratory bird that does nest on the eastern plains of Colorado. 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. Agricultural lands (pasture and row crop) function as nesting habitat in this region of the state. However, due to the minimal amount of public lands on the plains, very little data has been collected on the distribution of mountain plover within the project area.

Environmental Effects

Proposed Action:

Direct and Indirect Impacts:

Because there is no suitable habitat within the Project Area, there would be no effect to threatened or endangered species are anticipated under the Proposed Action or the No Action alternative.

However, potential impacts to mountain plover may occur. 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. However, continued surface disturbing activities associated with implementation of the Proposed Action would remove yet more potential habitat and continue to fragment an already fragmented landscape. Noise generated during construction, drilling, and production phases will likely result in a larger impact footprint then the disturbance footprint alone. Predator populations that often increase in areas impacted by humans, such as corvids (i.e., crows, ravens), raptors, coyotes, badgers, weasels, and foxes, may experience an increase in some affected portions of the project area and would likely adversely affect mountain plovers. New fences, transmission lines, drill rigs, and other human structures

would provide new perch and nest sites for avian predators, while other facilities may provide new denning sites for mammalian predators. Increases in vehicular collisions with wildlife along new and existing roads would provide a food source that may allow increases in predator populations that could also prey on mountain plover.

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.

Cumulative Impacts:

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 the area.

No Action Alternative:

Direct and Indirect Impacts:

Same as the proposed action.

Protective/Mitigation Measures:

Same as the proposed action. The mountain plover is a species protected by a federal law (Migratory Bird Treaty Act); therefore, the mitigation measure would remain applicable to fee/fee lands as well.

Cumulative Impacts:

May be similar to Proposed Action

3.3.3. Vegetation

Affected Environment: Key species such as green needlegrass, western wheatgrass, American vetch, fourwing saltbush and winterfat have been reduced to remnant amounts. Blue grama and buffalograss have increased in abundance, dominate the community, and are beginning to take on a sod appearance. Sand dropseed, red threeawn, sixweeks fescue, plains pricklypear, hairy goldaster and bottlebrush squirreltail have also increased. This plant community is at risk of losing western wheatgrass, which is the major cool season grass left at this point.

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.

Cumulative Impacts: Pad construction for the project would result in a slight reduction in native vegetation in the general project area, however, much of the vegetation in the project area is already highly modified as a result of oil and gas and agricultural activities.

No Action Alternative:

Direct and Indirect Impacts:

May be similar to the Proposed Action.

Protective/Mitigation Measures: None

Cumulative Impacts:

May be similar to the Proposed Action.

Other Alternative:

Direct and Indirect Impacts:

Protective/Mitigation Measures:

Cumulative Impacts:

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 three 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 37.5 acres of shortgrass prairie to well pads and associated infrastructure. The majority of these areas would be reclaimed and re-vegetated, with 13.5 acres of permanent surface disturbance associated with the four pads and their access roads. There would be a minor direct loss of suitable wildlife habitat in the area; however, functional loss of habitat is to occur due to continued fragmentation along with the presence of human and introduction of human development. 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. However, decreased human activity during the production phase would reduce these potential indirect impacts to wildlife.

Protective/Mitigation Measures:

None.

Cumulative Impacts:

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 the area.

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 terrestrial wildlife would be the same as under the Proposed Action alternative.

Protective/Mitigation Measures:

None.

Cumulative Impacts:

May be similar to Proposed Action

3.3.5. Migratory Birds

Affected Environment:

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.

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. However, continued surface disturbing activities associated with implementation of the Proposed Action would remove yet more potential habitat and continue to fragment an already fragmented landscape. Noise generated during construction, drilling, and production phases will likely result in a larger impact footprint then the disturbance footprint alone. Predator populations that often increase in areas impacted by humans, such as corvids (i.e., crows, ravens), raptors, coyotes, badgers, weasels, and foxes, may experience an increase in some affected portions of the project area and would likely adversely affect mountain plovers. New fences, transmission lines, drill rigs, and other human structures would provide new perch and nest sites for avian predators, while other facilities may provide new denning sites for mammalian predators. Increases in vehicular collisions with wildlife along new and existing roads would provide a food source that may allow increases in predator populations that could also prey on migratory birds.

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 timing limitation 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.

Cumulative Impacts:

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 the area.

No Action Alternative:

Direct and Indirect Impacts:

May be similar to Proposed Action.

Protective/Mitigation Measures:

None.

Cumulative Impacts:

May be similar to Proposed Action

3.4. Heritage Resources and Human Environment

3.4.1. Cultural Resources

Affected Environment: Both prehistoric and historic sites are present in the vicinity of the area of potential effect [see Reports CR-RG-13-76 N, CR-RG-13-119 N, CR-RG-13-120 P, and CR-RG-15–47 N]. Although an isolated find (5WL7342) was recorded during one of the cultural resources inventories, it is not eligible for the National Register of Historic Places, and therefore, does not qualify as a historic property. Therefore, no historic properties will be affected by the proposed undertaking.

3.4.2. Native American Religious Concerns

Affected Environment: Although aboriginal sites are present in Weld County, there are no identified properties of traditional religious or cultural significance in the APE. The cultural resources inventories of the APEs produced no other evidence that suggests the APE holds special significance for Native Americans. The BLM conducted a consultation with the following tribes (CR-RG-14–34 NA): Apache Tribe of Oklahoma, Cheyenne and Arapaho Tribes of Oklahoma, Cheyenne River Sioux Tribe, Comanche Tribe of Oklahoma, Crow Creek Sioux, Eastern Shoshone, Jicarilla Apache Nation, Kiowa Tribe of Oklahoma, Northern Arapaho Tribe, Northern

Cheyenne Tribe, the Ute Tribe, Oglala Sioux Tribe, Pawnee Tribe, Rosebud Sioux Tribe, Southern Ute Tribe, Standing Rock Lakota Tribe, and the Ute Mountain Ute Tribe.

3.4.3. Paleontological Resources

Affected Environment:

The proposed wells are located on 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 location.

The White River formation is a Class 5 geologic formation, according to the BLM's Potential Fossil Yield Classification (PFYC) System that was created to assist in determining proper mitigation approaches for surface disturbing activities (WO IM 2008-009). 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. There are several vertebrate fossil finds in the same formation within located near the proposed well locations.

Environmental Effects

Proposed Action:

The proposed access roads, pipelines, and well pads would disturb the surface, potentially penetrate the protective soil layer and potentially encounter federally protected vertebrate fossils.

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.

Protective/Mitigation Measures:

The proposed construction of the well pads, access to the well pads, and pipeline 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 by a BLM qualified paleontologist 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 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.

Cumulative Impacts:

Past and current impacts to important fossil resources could be long-term and significant since fossils removed or destroyed would be lost to science. Impacts to paleontological resources can be reduced to a negligible level through mitigation of ground disturbing activities. It is possible that the proposed activity would have a beneficial impact in that ground disturbing activities may result in the discovery of important fossil resources.

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:

None

Cumulative Impacts:

May be similar to Proposed Action

3.4.5. Wastes, Hazardous and 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.

Cumulative Impacts:

Cumulative impacts will be reduced to negligible if protective mitigation measures are followed.

No Action Alternative:

Direct and Indirect Impacts:

May be similar to Proposed Action

Protective/Mitigation Measures:

None

Cumulative Impacts:

May be similar to Proposed Action

3.5. Cumulative Impact Summary

The proposed project is located in Weld County, Colorado. Weld County's economy is based primarily on Oil and Gas development and crop and livestock production. Due to this, much of the natural landscape of Weld County has been modified. Weld County has by far more Oil and Gas wells than any other county in Colorado, with over 22,000 active oil and/or gas wells. The vast majority of these wells are located on privately owned surface and produce entirely privately owned minerals. Because of the comparatively small number of federally owned mineral parcels in this area, the cumulative impact of the drilling and operation of these nineteen wells would add incrementally to the cumulative impacts of oil and gas development in Weld County. These include minor impacts to air, fluid minerals (geology), soils, vegetation and wildlife.

Air: 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 22,000 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.

Geology (Fluid Minerals): Cumulative impacts on geology and minerals resources would primarily occur as a result of development, which would irreversibly deplete recoverable hydrocarbons from the producing formation.

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.

Vegetation: Pad construction for the project would result in a slight reduction in native vegetation in the general project area, however, much of the vegetation in the project area is already highly modified as a result of oil and gas and agricultural activities.

Chapter 4 Consultation and Coordination

4.1. List of Preparers and Participants

Please see Interdisciplinary Team Review Table for BLM participants.

4.2. Tribes, Individuals, Organizations or Agencies Consulted

The following triibes were consulted at the lease stage:

Apache Tribe of Oklahoma, Cheyenne and Arapaho Tribes of Oklahoma, Cheyenne River Sioux Tribe, Comanche Nation of Oklahoma, Crow Creek Sioux, Eastern Shoshone, Jicarilla Apache Nation, Kiowa Tribe of Oklahoma, Northern Arapaho Tribe, Northern Cheyenne Tribe, the Ute Tribe, Oglala Sioux Tribe, Pawnee Tribe, Rosebud Sioux Tribe, Southern Ute Tribe, Standing Rock Lakota Tribe, and the Ute Mountain Ute Tribe

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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.

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Finding of No Significant Impact

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 RGFO has received 15 Application for Permit to Drill (APD), and is anticipating receiving 4 additional APDs in the near future, proposing the construction of four well pads, access roads, and the drilling of 19 horizontal oil wells on private surface over private minerals, developing both private and federal minerals (fee/fee/fed). The operator plans to drill completely fee (100% private) wells from the surface of some or all of these proposed pads, regardless of the BLM's decision on the proposed federal 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.

The projects are located on rangeland in Northeast Weld County approximately 15 miles northeast of the town of Keota, Colorado. 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 over federal minerals (off lease), there is no public land or 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 Razor Federal 29L, 30J, 30L and 32O APDs Project decision relative to each of the ten areas suggested for consideration by the CEQ. With regard to each:

Impacts that may be beneficial and adverse: I have considered the potential intensity/severity of the impacts anticipated from the proposed Razor Federal 29L, 30J, 30L and 32O APDs**.** 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 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: Jay Raiford

NAME OF ENVIRONMENTAL COORDINATOR: Martin Weimer

DATE: 7/1/2015

SIGNATURE OF AUTHORIZED OFFICIAL: /s/ Keith E. Berger

Keith E. Berger, Field Manager

DATE SIGNED:7/2/15

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Chapter 7. Razor Federal 29L, 30J, 30L and 32O APDs

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DECISION RECORD

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

NEPA Number: DOI-BLM-CO-F02-2014-0074-EA

7.1. Razor Federal 29L, 30J, 30L and 32O APDs

DECISION: It is my decision to authorize the Proposed Action as described in the attached EA. The proposed action is the construction of 4 well pads and infrastructure, and the drilling and completion of up to 19 horizontal oil wells on private surface over private minerals, developing both private and federal minerals (fee/fee/fed).

The projects are located on rangeland in Northeast Weld County approximately 15 miles northeast of the town of Keota, Colorado. 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 over federal minerals (off lease), there is no public land or public access in the project area.

The proposed action was analyzed in the Environmental Assessment (EA) DOI-BLM-CO-F02-2014-0074 and a Finding of No Significant Impact was reached and an EIS will not be prepared.

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 19 proposed wells would have mostly temporary and overall minor impacts on resources present in the project area.

7.2. Rationale:

This project will develop oil and gas resources on Federal minerals Lease COC49320 and COC61148 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 19 proposed wells would have mostly temporary and overall minor impacts on resources present in the project area.

7.3. Mitigation Measures and Monitoring:

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

Applicant will continuously apply water or dust-suppressant to public unpaved surfaces that access the new well pad / facility likely to be disturbed during construction / well development phase and during operations / production phase during dry periods.

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.

Paleontological Resources: 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.

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.

7.4. Appeal or Protest Opportunities:

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.

7.5. Authorizing Official:

/s/ Keith E. Berger 7/2/15

Keith E. Berger Date
Field Office Manager