BLM

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

DOI-BLM-UT-G010-2014-0262-EA

Final Environmental Assessment Kerr-McGee Oil & Gas Onshore, LP Proposal to Directionally Drill 115 Wells fromEight New Well Pads and Fourteen Expanded Well Pads Greater Natural Buttes Unit, Uintah County, Utah October 2014

PREPARING OFFICE

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

DOI-BLM-UT-G010-2014-0262-EA

Final Environmental Assessment
Kerr-McGee Oil & Gas Onshore, LP
Proposal to Directionally Drill 115 Wells from Eight New Well Pads and Fourteen Expanded Well Pads
Greater Natural Buttes Unit, Uintah County, Utah
October 2014

Prepared by
U.S. Department of the Interior
Bureau of Land Management
Location: Township 9 South, Range 21 East, Sections 29 and 30 Uintah County, Utah
Kerr-McGee Oil and Gas Onshore, LP
Denver, CO
U.S. Department of the Interior

Bureau of Land Management

Vernal Field Office

170 South 500 East

Vernal, Utah 84078

Phone: (435) 781-4400

Fax: (435) 781-4410

This page intentionally
left blank

Table of Contents

This page intentionally
left blank

List of Figures

This page intentionally
left blank

List of Tables

This page intentionally
left blank

Finding of No Significant Impact

Finding of No Significant Impact:

Based on the analysis of potential environmental impacts DOI-BLM-UT-G010-2014–0262–EA, I have determined that the proposed action will not have any significant impacts on the environment, and an environmental impact statement is not required.

Signatures:

Recommended by:

/s/ Tyler Cox	12/23/2014
Tyler Cox Natural Resource Specialist	[Date]

Approved by:

/s/ Jerry Kenczka	12/29/2014
Authorized Officer AFM for Minerals	[Date]

This page intentionally
left blank

Decision Record - Memorandum

Selected Action:

It is my decision to approve the Kerr McGee Oil & Gas LLP proposal to develop gas resources in Township 9S, Range 21E, Section 29 and Section 30 of the Greater Natural Buttes Unit within the GNBPA, Uintah County, Utah (Map 1). The development would occur on BLM-administered land.

KMG's Proposed Action includes the following components as depicted in Map 1 and Table 1:

- Directional drilling of up to 115 new natural gas wells (Table 1, Appendix B), including

  75 new wells drilled from 13 existing well pads (921–29A, 921–29E, 921–29G, 921–29I, 921–29J, 921–29K, 921–29L, 921–29N, 921–29O, 921–30A, 921–30D, 921–30F, 921–30G, and 921–30I) that would be expanded to accommodate topsoil stockpiles, reserve pits, excess cut stockpiles, and other uses necessary to develop the new wells (10.74 acres).

  40 New wells drilled from 8 new well pads (921–29B, 921–29C, 921–29F, 921–30K, 921–30L, 921–30M, 921–30N, 921–30O, and 921–30P)

- Installation of approximately 24,325 feet (19.75 acres) of new gas and liquid gathering pipelines to collect and transport gas and fluids from the wells to existing infrastructure.

- Construction of approximately 12,035 feet (12.43 acres) of new access roads and re-routes.

Conditions of Approval:

This decision is contingent on meeting all stipulations and monitoring requirements listed below, which were designed to minimize and/or avoid impacts.

KMG adopted applicable COAs from Appendix B, Table B-2, of the GNB ROD (BLM 2012b), as Applicant-Committed Environmental Protection Measures (ACEPMs) for this Proposed Action. Table 1, "Applicant-Committed Resource Protection Measures" (p. 17) identifies ACEPMs from the GNB ROD (BLM 2012b) and other sources that are specific to well pads and development in the Project Area that may become COAs in the Decision Record for the Proposed Action.

Table 1. Applicant-Committed Resource Protection Measures

Well Pad/Area	Resource	Resource Protection Measures
Scientifically important fossils and locations of high fossil potential intersect with proposed project components in Section 921-29: well pads 29B, 29C, 29E, 29F, 29G, 29I, 29J, 29K, 29L, 29O; and in Section 921-30: well pads 30I, 30K, 30L, 30M, 30O, and 30P	Paleontology	• Paleontological monitoring by a BLM permitted paleontologist is required during all ground-disturbing activities for proposed development areas found to have scientifically important fossils or in locations of high fossil potential (BLM 2012b).
All proposed well pads and developments in the Project Area	Fish and Wildlife – Migratory Birds	• Bird exclusion netting will be installed over reserve pits containing water that are left open for more than 30 days to reduce possibility of exposure to hazardous chemicals (BLM 2012b). • KMG will install bird-excluding devises that prevent the perching and entry of migratory birds on or into its new fired vessel exhaust stacks (BLM 2012b).
Proposed expansions of existing well pads 921-29G, 921-29I, and 921-29J and associated components	Fish and Wildlife – Great Horned Owl Nest	Raptor management will be guided by the use of "Best Management Practices for Raptors and Their Associated Habitats in Utah" (BLM 2008 Appendix A) and "Fluid Minerals Best Management Practices" (BLM 2008 Appendix R), utilizing seasonal and spatial buffers, as well as mitigation, to maintain and enhance raptor nesting and foraging habitat, while allowing other resource uses. • Construction and development activities will be seasonally limited from 2/1 through 9/31, pending the results of a preconstruction nest occupancy survey (BLM 2008). • Raptor perch avoidance devices will be installed on all new powerlines and existing lines that present a potential hazard to raptors (BLM 2008).

Well Pad/Area	Resource	Resource Protection Measures
Proposed new well pads 921-29B and 921-29C, and associated components; proposed buried liquid and gas pipelines associated with proposed expansion of well pad 921-29G	Fish and Wildlife – Golden Eagle Nest	Raptor management will be guided by the use of "Best Management Practices for Raptors and Their Associated Habitats in Utah" (BLM 2008 Appendix A) and "Fluid Minerals Best Management Practices" (BLM 2008 Appendix R), utilizing seasonal and spatial buffers, as well as mitigation, to maintain and enhance raptor nesting and foraging habitat, while allowing other resource uses. ● Construction and development activities will be seasonally limited from 1/1 through 8/31, pending the results of a preconstruction nest occupancy survey (BLM 2008). ● Raptor perch avoidance devices will be installed on all new powerlines and existing lines that present a potential hazard to raptors (BLM 2008).
Proposed new well pads 921-29B and 921-29C and associated components; and, the proposed expansion of existing well pad 921-29G and associated components	Fish and Wildlife – Prairie Falcon Nest	Raptor management will be guided by the use of "Best Management Practices for Raptors and Their Associated Habitats in Utah" (BLM 2008 Appendix A) and "Fluid Minerals Best Management Practices" (BLM 2008 Appendix R), utilizing seasonal and spatial buffers, as well as mitigation, to maintain and enhance raptor nesting and foraging habitat, while allowing other resource uses. ● Construction and development activities will be seasonally limited from 4/1 through 8/31, pending the results of a preconstruction nest occupancy survey (BLM 2008). ● Raptor perch avoidance devices will be installed on all new powerlines and existing lines that present a potential hazard to raptors (BLM 2008).

Well Pad/Area	Resource	Resource Protection Measures
All proposed well pads and developments in the Project Area	Fish and Wildlife – Colorado River Basin Fish Species	• An infiltration gallery will be constructed in a USFWS-approved location. An infiltration gallery is basically a pit or trench dug within a floodplain to a depth below the water table. Water is drawn from the pit rather than from the river directly. If this is not possible, KMG will limit pumping within the river to off-channel locations that do not connect to the river during high spring flows. • If water cannot be drawn using the measures below, and the pump head will be located in the river channel where larval fish are known to occur, the following measures will apply (BLM 2012b): • KMG will avoid pumping from low-flow or no-flow areas as these habitats tend to concentrate larval fishes; ○ KMG will avoid pumping to the greatest extent possible, during that period of the year when larval fish may be present (approximately April 1 to August 31); ○ KMG will avoid pumping, to the greatest extent possible, during the midnight hours (10:00 pm to 2:00am) as larval drift studies indicate that is a period of greatest daily activity. Dusk is the preferred pumping time as larval drift abundance is lowest. ○ KMG will screen all pump intakes with 3/32-inch mesh material.
Source: GNB ROD (BLM 2012b), Vernal RMP (2008a)		

Rationale:

The subject lands were leased for oil or gas development under authority of the Mineral Leasing Act of 1920, as modified by the Federal Land Policy and Management Act of 1976, and the Federal Onshore Oil and Gas Leasing Reform Act of 1987. The lessee/operator has the right to explore for oil and gas on the lease as specified in 43 CFR 3103.1-2, and if a discovery is made, to produce oil and/or natural gas for economic gain.

The selected alternative meets the BLM's need to acknowledge and allow development of valid existing leases. The BLM objective to reduce impacts is met by the imposing of mitigation measures to protect other resource values.

Land Use Plan Conformance:

The selected alternative is in conformance with the Vernal Field Office Resource Management Plan and Record of Decision (BLM 2012).

The selected alternative is consistent with *Uintah County General Plan* (published in 2007) that encompasses the location of the proposed wells. In general, the plan indicates support for development proposals such as the selected alternative through the plan's emphasis of multiple-use public land management practices, responsible use and optimum utilization.

There are no comprehensive State of Utah plans for the vicinity of the selected alternative. However, the State of Utah School and Institutional Trust Lands Administration (SITLA) have leased much of the nearby state land for oil and gas production. Because the objectives of SITLA are to produce funding for the state school system, and because production on federal leases could further interest in drilling on state leases in the area, it is assumed that the selected alternative is consistent with the objectives of the State.

Public Involvement:

The proposed project was posted on the Eplanning NEPA Register on 9 September 2014. No expression of public interest was received.

Alternatives Considered:

The EA analyzed the proposed action and no action alternatives. The no action alternative was not selected because it would not best meet the BLM's need to acknowledge and allow development of valid existing leases.

Appeal or Protest Opportunities:

This decision is effective upon the date it is signed by the authorized officer. The decision is subject to appeal. Under BLM regulation, this decision is subject to administrative review in accordance with 43 CFR 3165. Any request for administrative review of this decision must include information required under 43 CFR 3165.3(b) (State Director Review), including all supporting documentation. Such a request must be filed in writing with the State Director, Bureau of Land Management, Utah State Office, P.O. Box 45155, Salt Lake City, Utah, 84145-0155, within 20 business days of the date this Decision is received or considered to have been received.

If you wish to file a petition for stay, the petition for stay should accompany your notice of appeal and shall show sufficient justification based on the following standards:

1. The relative harm to the parties if the stay is granted or denied;

2. The likelihood of the appellant's success on the merits;

3. The likelihood of irreparable harm to the appellant or resources if the stay is not granted; and,

4. Whether the public interest favors granting the stay.

Signature:

Authorizing Official:

/s/ Jerry Kenczka	12/29/2014
Authorized Officer	Date

Acronyms and Abbreviations

µg/m^3	micrograms per cubic meter
ACEPM	Applicant Committed Environmental Protection Measure
ACTS	Anadarko Completions Transportation System
APD	Application for Permit to Drill
BLM	Bureau of Land Management
BMP	Best Management Practice
BTEX	isomers of xylene
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CIAA	Cumulative Impact Analysis Area
CO	Carbon Monoxide
COA	Condition of Approval
DR	Decision Record
EA	Environmental Assessment
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FLPMA	Federal Land Policy and Management Act
FONSI	Finding of No Significant Impact
GHG	Greenhouse Gas
GIS	Geographic Information System
GNB	Greater Natural Buttes
GNBPA	Greater Natural Buttes Project Area
GPS	Global Positioning System
HAP	Hazardous Air Pollutant
ID	Interdisciplinary
KMG	Kerr-McGee Oil & Gas Onshore, LP
MBTA	Migratory Bird Treaty Act
MLA	Mineral Leasing Act
MOU	Memorandum of Understanding
MSDS	Material Safety Data Sheets
NAAQS	National Ambient Air Quality Standards
NASA	National Aeronautics Space Administration
NBU	Natural Buttes Unit
NEPA	National Environmental Policy Act
NI	Not Impacted
NO_2	Nitrogen Dioxide
NO_X	Nitrous Oxide
NOAA	National Oceanic and Atmospheric Administration
NP	Not Present
O_3	Ozone
PAR	Pesticide Application Record
PFYC	Potential Fossil Yield Classification
PI	Potentially Impacted
PM	Particulate Matter
$PM_{2.5}$	particulate matter less than 2.5 microns in diameter
PM_{10}	particulate matter less than 10 microns in diameter
ppb	parts per billion
PUP	Pesticide Use Permit
PUR	Pesticide Use Report
RCRA	Resource Conservation and Recovery Act
RMP	Resource Management Plan

ROD	Record of Decision
ROW	Right-of-way
SARA	Superfund Amendments and Reauthorization Act
SHPO	State Historic Preservation Office
SITLA	School and Institutional Trust Lands Administration
SO_2	Sulfur Dioxide
SO_X	Sulfur Oxides
SPCC	Spill Control and Countermeasure
SWD	Salt Water Disposal
TPY	Tons per Year
U.S.C.	United States Code
UDAQ	Utah Department of Air Quality
UDWR	Utah Division of Wildlife Resources
USFWS	U.S. Fish and Wildlife Service
USGCRP	U.S. Global Change Research Program
VOC	Volatile Organic Compound

Chapter 1. Introduction and Need for Proposed Action

This page intentionally
left blank

1.1. Introduction

This Environmental Assessment (EA) has been prepared to analyze the potential impacts of a proposed Kerr-McGee Oil & Gas Onshore LP (KMG) natural gas development project in the Natural Buttes Unit (NBU) of the Greater Natural Buttes Project Area (GNBPA). KMG proposes to construct and operate natural gas well pads, wells, and associated pipelines in Township 9 South, Range 21 East, Sections 29 and 30 of the NBU in the GNBPA in Uintah County, Utah. The EA is a site-specific analysis of potential impacts that would result from the implementation of the Proposed Action or alternatives to the Proposed Action. This EA incorporates analysis from the Greater Natural Buttes (GNB) Final Environmental Impact Statement (EIS)(BLM 2012a) as indicated. The EA assists the Bureau of Land Management (BLM) in project planning, ensuring compliance with the National Environmental Policy Act (NEPA), and in making a determination as to whether any "significant" impacts would result from the Proposed Action. "Significance" is defined by NEPA and is found in regulation 40 Code of Federal Regulations (CFR) 1508.27. An EA provides evidence for determining whether to prepare an EIS or a Finding of No Significant Impact (FONSI) statement. A FONSI statement briefly presents the reasons why implementation of the selected alternative would not result in "significant" environmental impacts (effects) or "significant" impacts to resources. If the Authorized Officer determines that this project has "significant" impacts, then the BLM would prepare an EIS for the project. If not, the Authorized Officer would sign a Decision Record (DR) for the EA approving the selected alternative.

1.2. Purpose and Need for the Proposed Action

The BLM's purpose is to allow KMG to develop its existing federal leases in order to meet domestic demands for oil and natural gas while also preventing unnecessary or undue degradation to public land. The proposed development would exercise existing lease rights to drill for, extract, remove, and market commercial quantities of oil and natural gas. The Mineral Leasing Act of 1920 (MLA), as amended, and the regulations and policies by which it is implemented recognize the right of lease holders to develop federal mineral resources to meet continuing needs and economic demands, so long as unnecessary or undue degradation is not incurred. This includes the right to build and maintain necessary improvements, subject to lease terms and conditions. The lessee has the right to use as much of the leased lands as is necessary to explore, develop, and dispose of the leased resource (43 CFR 3101.1-2) subject to lease terms, conditions, and stipulations.

The BLM's need is to respond to the applicant's proposal while minimizing environmental impacts and preventing unnecessary or undue degradation of the land. The Federal Land Policy and Management Act of 1976 (FLPMA) mandates that the BLM manage public lands on the basis of multiple use [43 United States Code (U.S.C.) § 1701(a)(7)]. Minerals are identified as one of the principal uses of public lands in Section 103 of FLPMA [43 U.S.C. § 1702(c)]. The FLPMA mandates that these uses be permitted in a manner that assures adequate protection of other resource values.

1.3. Conformance with BLM Land Use Plans

The Proposed Action would be in conformance with the BLM Utah Vernal Field Office Approved Resource Management Plan (RMP)/Record of Decision (ROD) (BLM 2008a) and the terms of the applicable leases. The RMP/ROD recognizes valid existing rights (RMP/ROD, page 21).

The Minerals and Energy Resources Management Objectives encourage the drilling of oil and gas wells by private industry (RMP/ROD, page 97). The Approved RMP/ROD also allows for processing applications, permits, operating plans, mineral exchanges, and leases on public lands in accordance with policy and guidance. It also allows for management of public lands to support goals and objectives of other resources programs, respond to public requests for land use authorizations, and acquire administrative and public access where necessary (RMP/ROD, page 86). The BLM has determined that the Proposed Action would not conflict with other decisions in the Vernal Field Office Approved RMP/ROD (BLM 2008a).

1.4. Relationship to Statutes, Regulations, or Other Plans

The Proposed Action and No Action Alternative are consistent with federal, state, and local laws, regulations, and plans (see sections below). Refer to Section 1.5 (pages 1-6 through 1-10) of the GNB Final EIS (BLM 2012a) for additional information on applicable statues, regulations, required permits, and other policy considerations.

Federal Laws and Statutes

The subject lands were leased for oil or gas development under authority of the MLA of 1920, as amended, in part, by the FLPMA of 1976, and the Federal Onshore Oil and Gas Leasing Reform Act of 1987.

State and Local Laws and Statutes

There are no comprehensive State of Utah plans for the vicinity of the Proposed Action. The Proposed Action is consistent with the 2011 Uintah County General Plan, as amended (County Plan), that encompasses the location of the Proposed Action. In general, the County Plan indicates support for development proposals such as the Proposed Action through the plan's emphasis on multiple-use public land management practices, responsible use, and optimum utilization (Uintah County 2012).

The State of Utah School and Institutional Trust Lands Administration (SITLA) has leased much of the nearby state land for oil and gas production. Because the objectives of SITLA are to produce funding for the state school system, and because production on federal leases could lead to further interest in drilling on state leases in the area, it is assumed that the Proposed Action is consistent with the objectives of the state.

Utah's Standards for Rangeland Health (BLM 1997) address upland soils, riparian/wetlands, desired and native species, and water quality. These resources are analyzed later in this document or, if not affected, are listed in Appendix A.

1.5. Identification of Issues

BLM reviewed KMG’s proposed activities to assess the type and magnitude of potential impacts to resources and resource uses. A list of all resources considered is contained in Appendix A, Interdisciplinary (ID) Team Checklist. The “Potentially Impacted” (PI) resources, as identified by the BLM, are listed below with issue statements describing the potential impact. These resources are carried forward for description in the Affected Environment section (Chapter 3) and analysis in the Environmental Impacts section (Chapter 4) of this EA. Resources that the BLM identified

as "Not Impacted" (NI) by the Proposed Action or "Not Present" (NP) in the Project Area, as documented in the ID Team Checklist, were not carried forward for detailed analysis.

1.5.1. Air Quality and Greenhouse Gas Emissions

Issue 1: Emissions from earth-moving equipment, vehicle traffic, drilling and completion activities, daily tailpipe and fugitive dust emissions, and other sources would adversely affect air quality. No standards for greenhouse gases (GHGs) have been set by the U.S. Environmental Protection Agency (EPA) or other regulatory agencies. It is anticipated that greenhouse gas emissions associated with the Proposed Action would be negligible.

1.5.2. Invasive Plants/Noxious Weeds, Soils, and Vegetation

Issue 1: The expansion of fourteen existing well pads and construction of eight new well pads and liquids gathering pipelines would result in approximately 98.39 acres of surface disturbance, which would result in the potential spread and establishment of invasive plants and noxious weeds.

Issue 2: The expansion of fourteen existing well pads and construction of eight new well pads and liquids gathering pipelines would result in approximately 98.39 acres of surface disturbance, which would result in direct and indirect impacts to vegetation and soils.

1.5.3. Paleontology

Issue 1: The Project Area contains several scientifically significant fossils and locations of high fossil potential. Section 921-29: well pads 29B, 29C, 29E, 29F, 29G, 29I, 29J, 29K, 29L, 29O; and Section 921-30: well pads 30I, 30K, 30L, 30M, 30O, and 30P as well as multiple segments of proposed access roads and gathering pipelines were identified as requiring paleontological monitoring during proposed project activities to ensure no adverse effects occur to existing resources.

1.5.4. Wildlife

1.5.4.1. Wildlife – Migratory Birds (including raptors)

Issue 1: Migratory birds and raptors occur in the Project Area. Proposed project activities would result in temporary or long-term displacement and/or disruption of nesting birds.

1.5.4.2. Wildlife – Non-USFWS Designated

Issue 1: Up to 20 percent of fresh water used for drilling, completion, and dust suppression activities could come from water sources that contribute to the Upper Colorado River Basin and could result in indirect impacts to non-USFWS designated fish species.

1.5.4.3. Wildlife – Threatened, Endangered, Proposed or Candidate

Issue 1: Up to 20 percent of fresh water used for drilling, completion, and dust suppression activities could come from water sources that contribute to the Upper Colorado River Basin and could result in indirect impacts to federally listed fish species.

1.5.5. Livestock Grazing and Rangeland Health Standards

Issue 1: Proposed project activities may affect livestock movement patterns, access to water and may result in the loss of AUMs due to a cumulative loss of surface vegetation within the Sand Wash Cattle Grazing Allotment. In addition, proposed project activities may impact Rangeland Health Standards due to the presence of a long-term rangeland health site located in the Project Area.

Chapter 2. Description of Alternatives

This page intentionally
left blank

2.1. Introduction

This chapter provides a description of the Proposed Action and No Action Alternative. No additional action alternatives have been identified. The No Action Alternative is considered and analyzed to provide a baseline for comparison of the impacts of the Proposed Action. The Proposed Action integrates the terms and conditions in the GNB ROD (BLM 2012b).

2.2. Proposed Action

KMG proposes to develop natural gas resources in Township 9S, Range 21E, Sections 29 and 30 of the NBU within the GNBPA, Uintah County, Utah (Figure 2.1, "General Location and Proposed Action Map" (p. 7)). The Proposed Action would result in an estimated 98.39 acres of short-term disturbance and an estimated 58.05 acres of long-term disturbance. Specifically, KMG's Proposed Action includes the following components as depicted on Figure 2.1, "General Location and Proposed Action Map" (p. 7) and summarized in Table 2.1, "Proposed Action Development and Surface Disturbance Summary" (p. 8).

- Directional drilling of up to 115 new natural gas wells, including:
  - 75 new wells drilled from 14 existing well pads (921-29E, 921-29G, 921-29I, 921-29J, 921-29K, 921-29L, 921-29N, 921-29O, 921-30A, 921-30D, 921-30F, 921-30G, 921-30I, and 921-30K) that would be expanded to accommodate topsoil stockpiles, reserve pits, excess cut stockpiles, and other uses necessary to develop the new wells (25.07 acres).
  - 40 new wells drilled from 8 new well pads (921-29B, 921-29C, 921-29F, 921-30L, 921-30M, 921-30N, 921-30O, and 921-30P) (40.26 acres).
- Installation of approximately 24,325 feet (19.75 acres) of new gas and liquid gathering lines to collect and transport gas and fluids from the wells, including:
  - 11,868 total feet (9.17 acres) of new buried 6-inch, 8-inch, and 10-inch gas and liquid gathering lines to collect and transport gas and fluids.
  - 12,457 feet (10.58 acres) of new 16-inch buried gas pipeline. The 16-inch buried gas pipeline will be owned and permitted under Anadarko Uintah Midstream, LLC (AUM).
- Construction of approximately 12,035 feet (12.43 acres) of new access roads and re-routes.

Refer to Appendix B for listing of proposed new wells and associated well pads. Appendix C provides a detailed description of development and surface disturbance by proposed well location.

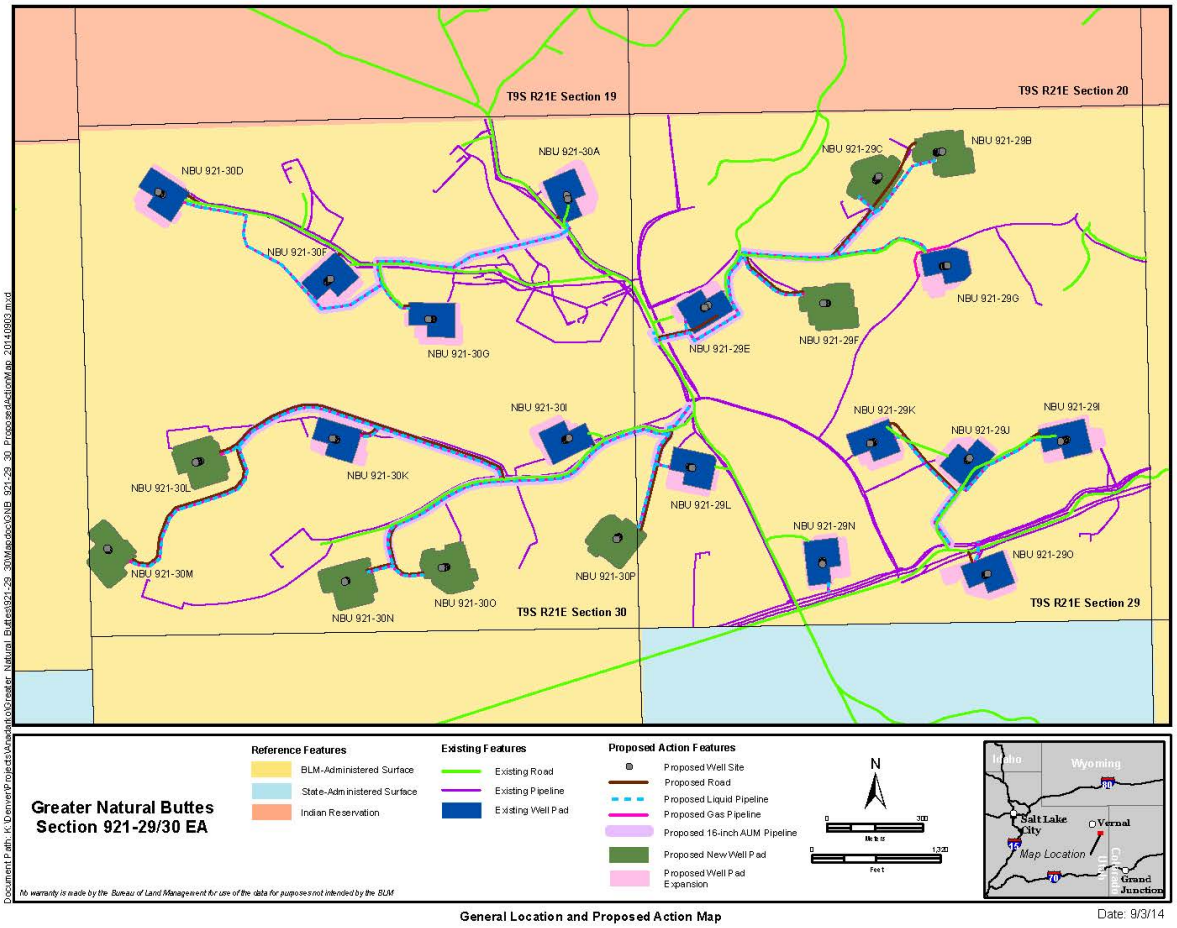

Figure 2.1. General Location and Proposed Action Map

Table 2.1. Proposed Action Development and Surface Disturbance Summary

Feature	New Well Pads	Existing Well Pad Expansions	Total
Wells and Well Pads			
Number of Proposed Pads	8	14	22
Number of Proposed New Wells on Well Pads	40	75	115
Proposed New Well Pad Disturbance (acres)	40.26	25.07	65.33
Number of Existing Wells on Well Pads	-	13	13
Existing Well Pad Disturbance (acres)	-	45.93	45.93
Roads			
Proposed New Roads (feet)[1]	9,666	2,369	12,035
Proposed New Road Disturbance (acres)[1]	9.99	2.44	12.43
Existing Roads (miles)	-	-	32,955[3]
Existing Roads (acres)	-	-	13.62[3]

Feature	New Well Pads	Existing Well Pad Expansions	Total
Buried Gas and Liquids Pipelines			
Proposed New 6, 8, and 10-inch Gas and Liquid Gathering Pipelines (feet)[2,4]	5,479	6,389	11,868[4]
Proposed New 6, 8, and 10-inch Gas and Liquid Gathering Pipeline Disturbance (acres)[2,4]	4.16	5.01	9.17
Proposed New AUM 16-inch Buried Gas Pipeline (feet)[2,4]	5,664	6,793	12,457
Proposed New AUM 16-inch Buried Gas Pipeline (acres)[2,4]	4.78	5.80	10.58
Surface Disturbance Totals			
Total Acres of New Surface Disturbance	59.19	39.20	98.39
Total Existing Disturbance (acres)	—	45.93	59.55[5]
Total Disturbance including Existing and Proposed Development	59.19	84.25	157.94
Total Acres of New Long-Term Disturbance (acres)[6]	24.27	15.71	58.05

Note: Refer to Appendix C for a detailed description of surface disturbance by proposed well location in Section 921-29 and 921-30

[1]Assumes a 45-foot construction width, and a 12-18-foot running surface.
[2]Assumes a 30-foot construction width adjacent to existing roads and a 45-foot construction width cross-country.
[3]Existing road disturbance totals includes county and non-county roads, including BLM-administered land and state land.
[4]The gas and liquids pipelines associated with each well pad would be buried in the same trench. The length (feet) represents the total combined length of the pipelines.
[5]Includes the total existing disturbance for well pads, roads, and pipelines, shown on Figure 2.1, "General Location and Proposed Action Map" (p. 7), including BLM-administered and state lands.
[6]The reclamation estimate is based on the estimated reclaimable surface disturbance percentage (41 percent of new disturbance) for the selected alternative in the GNB ROD (BLM 2012b).

2.2.1. Construction and Disturbance

The location, orientation, and layout of each well pad are depicted on the exhibits submitted with the application for permit to drill (APD). Site-specific conditions may require slight deviations from exhibits filed with the APD; however, KMG would not exceed the proposed area of disturbance. The construction of project components under the Proposed Action would result in approximately 98.39 acres of surface disturbance as described in Table 2.1, "Proposed Action Development and Surface Disturbance Summary" (p. 8).

2.2.2. Access Roads

The majority of access roads would consist of existing county and local improved/unimproved access roads (two-tracks). Where applicable, KMG would obtain county road crossing or

encroachment permits prior to construction. Well development for all new well pad locations would require new access roads as summarized in Table 2.1, "Proposed Action Development and Surface Disturbance Summary" (p. 8) and identified by well location in Appendix C. In accordance with Onshore Oil and Gas Order #1, KMG would, using Best Management Practices (BMPs), improve or maintain existing roads in a condition that is the same as or better than before operations began. All new or reconstructed roads would be located, designed, and maintained to meet the standards of the BLM's Surface Operating Standards for Oil and Gas Exploration and Development, 4th Edition (Gold Book) (USDI and USDA 2007).

Roads would be crowned and ditched with the running surfaces of the roads approximately 12-18 feet wide and a total road corridor width not to exceed 45 feet, except where noted in the road design for a specific project. Maximum grade would generally not exceed eight (8) percent. Borrow ditches would be back sloped 3:1 or less. KMG would employ construction BMPs and the Conditions of Approval (COAs) listed in the GNB FEIS (BLM 2012a) and ROD (BLM 2012b) to control onsite and offsite erosion.

KMG would construct drainage ditches or other common drainage control facilities, such as V- or wing-ditches to divert surface water runoff. Drainage features, including culverts, would be constructed or installed prior to commencing other operations, including drilling or facilities placement. KMG would place riprap at the inlet and outlet of the culvert(s), as necessary. Construction activity would not be conducted using frozen or saturated materials, or during periods when watershed damage (e.g., rutting, extensive sheet soil erosion, formation of rills/gullies, etc.) is likely to occur. KMG would not place vegetative debris in or under fill embankments. All drainage features would meet the BLM Surface Operating Standards for Oil and Gas Development, as stated in the Gold Book (USDI and USDA 2007).

KMG would continue maintenance of roads until final abandonment and reclamation of well pads and/or other facilities. Road maintenance would include, but not be limited to, blading, ditching, culvert installation and cleanout, gravel surfacing where excessive rutting or erosion may occur and dust control, as necessary to ensure safe operating conditions. KMG would conduct snow removal on roads on an as-needed basis to accommodate safe travel. Removed snow may be stored on permitted well pads to reduce hauling distances.

2.2.3. Producing Locations

2.2.3.1. Production Facilities

Should the wells prove productive, KMG would install production facilities on the disturbed portion of each well pad. KMG would construct a berm completely around production components (typically excluding dehydrators and/or separators) that contain fluids (i.e., production tanks, produced liquids tanks). KMG would generally construct the berms with compacted subsoil or corrugated metal sufficient to hold 110 percent of the capacity of the largest tank and have sufficient freeboard to accommodate a 25-year rainfall event. Aboveground structures constructed or installed onsite for six (6) months or longer would be painted a flat, non-reflective, earth-tone color chosen at the onsite in coordination with the BLM (typically Shadow Gray).

KMG would use the Anadarko Completions Transportation System (ACTS) to optimize the completion processes for multiple pads. ACTS would facilitate management of hydraulic fracturing (fracking) fluids by refurbishing and utilizing existing completions pits and temporary,

surface-laid aluminum liquids transfer lines between fracking locations. The temporary aluminum transfer lines would be utilized to transport fracking fluid being injected and/or recovered during the completion process and would be laid adjacent to existing access roads or pipeline corridors. Upon completion of fracking operations, the liquids transfer lines would be flushed with fresh water and purged with compressed air. The contents of the transfer lines would be flushed into a water truck for delivery to another ACTS location or a completions pit.

KMG would fence all four sides of the completions pits according to standard pit fencing procedures and would install netting over all pits. The completions pits would be lined with a synthetic material 30 mil, or thicker, liner, and would be used for wells drilled on the pad or as part of the ACTS. Temporary flare or cuttings pits would be contained within the approved well pad and disturbance boundaries.

2.2.3.2. Pipelines

The gas gathering pipelines, including the AUM 16-inch pipeline, would be made of steel with fusion bond epoxy coating (or equivalent). The liquid gathering pipelines would be made of polyethylene or a composite polyethylene/steel or polyethylene/fiberglass that is not subject to internal or external pipe corrosion. The content of the produced fluids transferred by the liquid gathering system would be approximately 92 percent produced water and 8 percent condensate. Trunk line valve connections for the water gathering system would be below ground to prevent freezing during wintertime, but they would be accessible from the surface.

During buried pipeline construction, the topsoil would be removed and windrowed on the non-working side of the route for reclamation. The trench would be mechanically cut and excavated with trenching equipment, such as a backhoe or trencher. The width of the trench would range from 18 to 48 inches. KMG would excavate the trench to a 6 foot depth that would maintain a minimum of 48 to 60 inches of soil cover upon backfilling. The spoils would typically be windrowed between the topsoil and the trench. Where working room is limited, the spoils may be spread out across the working side and construction would take place on the spoil.

The road or well pad would be utilized for pipeline construction and staging, where possible. The area of disturbance from the edge of the road or well pad would typically be 30 feet in width, with segments up to 45 feet in width from edge of roadway in instances where the typical 30-foot disturbance area does not offer enough room to save topsoil. Where the pipelines run cross-country, the width of disturbance would typically be 45 feet for buried lines. A permanent right-of-way (ROW) of 30 feet would be needed for maintenance and repairs. KMG would use the working side of the corridor for pipe stringing, bedding, welding, and equipment travel. Small areas on the working side displaying ruts or uneven ground would be groomed to facilitate the safe passage of equipment.

If a pipeline route encounters a drainage that could be subject to flooding or surface water during extreme precipitation events, KMG would apply all applicable U.S. Army Corps of Engineers mandates as well as the BLM's Hydraulic Considerations for Pipeline Crossings of Stream Channels (BLM Technical Note 423, April 2007). KMG will evaluate stream and drainage crossings and will submit stream alteration permits to the State of Utah Division of Water Rights for the pipelines that cross drainages as needed. KMG will secure the stream alteration permits prior to crossing drainages.

Buried gas pipelines may vary from 8-inches to 16-inches in diameter; buried liquid lines would be 6-inches in diameter. The proposed pipelines would be visually and radiographically inspected and pneumatically or hydrostatically tested before being placed into service. Water used for hydrostatic testing would come from permitted water sources detailed in Table 2.2, "Water Supply" (p. 12). In no case would pressure testing of the pipelines result in discharge of liquids on the ground surface. KMG would install above ground valves, lateral T's, and/or cathodic protection wells at various locations for production integrity and safety purposes. KMG would install pipeline signs along the route to indicate the pipeline(s) proximity, ownership, and to provide emergency contact phone numbers. The pipelines would likely remain in place for a term of 30 years, or so long as needed to collect and transport natural gas and liquids from the Natural Buttes Field.

2.2.4. Water Supply

KMG would obtain fresh water and recycled water for drilling and completion operations from the sources identified in Table 2.2, "Water Supply" (p. 12). KMG would haul water to the proposed development locations using existing and proposed new roads. KMG would not drill any additional water wells on existing leases. The Proposed Action would require an estimated 14.95 acre-feet of water for drilling and 148.23 acre-feet for completions, for a total estimated water use of 163.18 acre-feet under the Proposed Action. KMG would mostly use recycled water for the Proposed Action with up to 20 percent of the estimated water use coming from fresh water delivered from the R.N. Industries Frog Pond (Table 2.2, "Water Supply" (p. 12)). As a result, up to 20 percent of the estimated water use could come from fresh water sources contributing to the Upper Colorado River Drainage system (32.64 acre-feet).

Table 2.2. Water Supply

Entity	Location
JD Field Services	Green River - Section 15, T2N, R22E
R.N. Industries	White River - Various sources
R.N. Industries	High Pressure – Section 1, T6S, R22E High Pressure – Section 6, T6S, R23E
R.N. Industries	Water Plant – Section 9, T8S, R20E
R.N. Industries	Frog Pond – Section 33, T8S, R20E
R.N. Industries	Blue Tanks – Section 32, T4S, R3E
Source: Kerr-McGee Standard Operating Practice for the GNB Field (KMG 2014)	

2.2.5. Produced Water Disposal

Where necessary, and if conditions (freeboard, etc.) allow, produced liquids (e.g., produced water) from newly completed wells may be temporarily disposed of into pits for a period not to exceed 90 days as per Onshore Order #7. After the 90 days, any produced water from the proposed wells would be contained in a water tank and would then be hauled by truck or transported by pumping into the liquid gathering line, which would carry the liquid to one of the following pre-approved disposal sites or the KMG active Salt Water Disposal (SWD) wells shown in Table 2.3, "Water Disposal Sites" (p. 13) below

Table 2.3. Water Disposal Sites

Pre-Approved Disposal Sites	KMG Active SWD Wells
RNI in Section 5, T9S, R22E	NBU 159 SWD in Section 35, T9S, R21E
NBU #159 in Section 35, T9S, R21E	CIGE 112D SWD in Section 19, T9S, R21E
Ace Oilfield in Section 2, T6S, R20E	CIGE 114 SWD in Section 34, T9S, R21E
MC&MC in Section 12, T6S, R19E	NBU 921-34K SWD in Section 34, T9S, R21E
Pipeline Facility in Section 36, T9S, R20E	NBU 921-33F SWD in Section 33, T9S, R21E
Goat Pasture Evaporation Pond in SW/4 Section 16, T10S, R22E	
Bonanza Evaporation Pond in Section 2, T10S, R23E	
Source: Kerr-McGee Standard Operating Practice for the GNB Field (KMG 2014) SWD Salt Water Disposal	

2.2.6. Waste Disposal

KMG would handle all wastes subject to regulation and in compliance with applicable laws to minimize the potential for leaks or spills to the environment. KMG also maintains a Spill Control and Countermeasure Plan (SPCC), which includes notification requirements for all applicable state and federal government agencies, for all reportable spills of oil, produced liquids, and hazardous materials.

Any accidental release, such as a leak or spill in excess of the reportable quantity, as established by 40 CFR Part 117.3, would be reported per the requirements of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, as amended 42 U.S.C. 9601 et seq., CERCLA, Section 102 B. If a release involves petroleum hydrocarbons or produced liquids, KMG would comply with the notification requirements of NTL-3A.

Drill cuttings and/or drilling fluids would be contained in the cuttings or completions pits regardless if a closed loop system is used. KMG would only use fresh water, biodegradable polymer soap, bentonite clay, and/or non-toxic additives in the mud system. Unless specifically approved by the BLM, no oil or oil-based drilling additives, chromium or other metal-based or saline muds would be used during drilling. KMG would bury drill cuttings in the pit(s) upon closure, or incorporate drill cuttings with spoils to be recontoured and covered with stockpile topsoil where possible. No garbage or non-exempt substances as defined by the Resource Conservation and Recovery Act (RCRA) Subtitle C would be placed in the pits.

All refuse (trash and other solid waste including cans, paper, cable, etc.) generated during construction, drilling, completion, and well testing activities would be contained in an enclosed receptacle, removed from the drill operations promptly, and transported to an approved disposal facility. Immediately after removal of the drilling rig, all debris and other waste materials not contained within trash receptacles would be collected and removed from the well location.

KMG would provide portable, self-contained chemical toilets and/or sewage processing facilities for human waste disposal. Upon completion of operations, or as required, KMG would pump the toilet holding tanks and dispose of the contents in an approved sewage disposal facility. KMG would observe all applicable regulations pertaining to disposal of human and solid wastes.

2.2.7. Hazardous Materials

Hazardous materials, as listed under the CERCLA of 1980 as amended, as defined in the RCRA of 1976 as amended, or as defined in 40 CFR 355, above reportable quantities would not be produced by drilling or completing the proposed well(s) or constructing the pipelines/facilities.

Hazardous materials may be contained in some grease or lubricants, solvents, acids, paint, and herbicides, among others as defined above. KMG maintains a file, per 29 CFR 1910.1200(g) containing current Material Safety Data Sheets (MSDS) for all chemicals, compounds, or substances used during the course of construction, drilling, completion, and production operations for this project. The transport, use, storage, and handling of hazardous materials would follow procedures specified by federal and state regulations.

KMG would not use chemicals meeting the criteria for being acutely hazardous materials/substances, or meeting the quantities criteria per BLM Instruction Memorandum No. 93-334. Chemicals subject to reporting under Title III of the Superfund Amendments and Reauthorization Act (SARA) in quantities of 10,000 pounds or more may be produced or stored at production facilities and may be kept on drilling sites and well locations for short periods of time during drilling or completion activities.

2.2.8. Invasive Plants/Noxious Weeds

KMG would control noxious weeds as needed during the life of the wells and the liquid and gas pipelines. According to the Anadarko Integrated Weed Management Plan, KMG would complete monitoring and management of noxious and invasive weeds of concern annually until reclamation is successful. KMG would map noxious weed infestations using a Global Positioning System (GPS) unit and submit the data to the BLM with information required in the Vernal BLM Surface Disturbance Weed Policy (BLM 2009).

If KMG applies herbicide, it would be done in accordance with an approved Pesticide Use Permit (PUP). KMG would record all pesticide applications using a Pesticide Application Record (PAR) and would submit the data to BLM along with a Pesticide Use Report (PUR) annually prior to December 31.

2.2.9. Reclamation

2.2.9.1. Measures Common to Interim and Final Reclamation

KMG would undertake surface reclamation in two phases: interim and final reclamation. Interim reclamation would be conducted following well completion and would extend through the period of production. KMG would conduct interim reclamation in areas of the well pads that are not required for production activities. KMG would conduct final reclamation following well plugging/conversion or facility abandonment processes. KMG would conduct all reclamation activities consistent with the BMPs and COAs in the GNB FEIS (BLM 2012a) and ROD (2012b).

Areas to be reclaimed would be re-contoured to a natural appearance. Fill and stockpiled spoils no longer necessary to the operation would be spread on the cut slopes and covered with stockpiled topsoil. Where possible, KMG would leave the land surface “rough” after re-contouring to

ensure that the maximum surface area would be available to support the reestablishment of vegetative cover.

KMG would conduct soil preparation for seeding using a disk for areas where needed following site preparation. This would provide primary soil tillage to a depth no greater than six inches. Seeding would occur according to the Green River District Guidelines (BLM 2011) as conditions allow and would typically be accomplished through the use of a no-till rangeland style seed drill with a "picker box" in order to seed "fluffy" seed. Where drill seeding is not used, for example, where severe erosion can become a problem or the use of machinery is not practical, seed would be broadcast and then raked into the ground at double the rate of drill seeding. Seed mixes will be selected from a list provided or approved by the BLM, or a specific seed mix will be proposed by KMG to the BLM and used after its approval. All seed will be certified and KMG will maintain tags. KMG will make every effort to obtain cheatgrass-free seed. Table 2.4, "Natural Buttes Area Seed Mix Species: Option 1" (p. 15) through Table 2.6, "Natural Buttes Area Seed Mix Species: Option 3" (p. 16) identify three proposed seed mix options for revegetating well sites, access roads, and the gas and liquid gathering pipeline trenches.

Table 2.4. Natural Buttes Area Seed Mix Species: Option 1

Seed Mix Species	Pure Live Seed(pounds/acre)
Indian Ricegrass (Nezpar)	3.00
Thick Spike Wheatgrass	2.00
Sandberg Bluegrass	0.5
Bottlebrush Squirreltail	1.00
Creasted Wheatgrass (Hycrest)	1.00
Winterfat	0.25
Shadscale	1.50
Four-wing Saltbrush	0.75
Forage Kochia	0.25
Total	**10.25**
Source: Kerr-McGee Standard Operating Practice for the GNB Field (KMG 2014)	

Table 2.5. Natural Buttes Area Seed Mix Species: Option 2

Seed Mix Species	Pure Live Seed(pounds/acre)
Galleta Grass	0.50
Great Basin Wildrye	0.50
Thickspike Wheatgrass	2.50
Indian Ricegrass (Nezpar)	1.00
Crested Wheatgrass	1.00
Siberian Wheatgrass	1.00
Bottlebrush Squirreltail	1.00
Munro Globemallow	0.10
Palmer Penstemon	0.10
Rocky Mtn beeplant	0.50
Western yarrow	0.10
Shadscale	0.50
Forage Kochia	0.50
Total	**9.30**
Source: Kerr-McGee Standard Operating Practice for the GNB Field (KMG 2014)	

Table 2.6. Natural Buttes Area Seed Mix Species: Option 3

Seed Mix Species	Pure Live Seed(pounds/acre)
Galleta Grass	2.00
Sandberg bluegrass	0.50
Shadscale	0.50
Bluebunch (secar)	2.00
Indian Ricegrass (Nezpar)	2.00
Western Wheatgrass (Arriba)	2.00
Palmer penstemon	0.25
Munro Globemallow	0.15
Black Sage	0.25
Winterfat	0.25
Forage Kochia	0.25
Total	**10.15**
Source: Kerr-McGee Standard Operating Practice for the GNB Field (KMG 2014)	

Additional soil amendments or stabilization may be required on sites with poor soils or excessive erosion potential. KMG would stabilize slopes using materials specifically designed to prevent erosion on steep slopes and hold seed in place so vegetation can become permanently established. Materials may include, but would not be limited to erosion control blankets, hydro-mulch, or bonded fiber matrix at a rate to achieve a minimum of 80 percent soil coverage. Soil amendments such as "Sustain" (an organic fertilizer that will be applied at the rate 1,800 to 2,100 pounds/acre with seed) may also be dry broadcast or applied with hydro-seeding equipment.

KMG would monitor and measure reclamation success according to the methods and standards described in the Green River District Reclamation Guidelines (BLM 2011). KMG would submit all monitoring reports to the Vernal BLM Field Office no later than March 1 of the year following the data collection.

2.2.9.2. Interim Reclamation

Interim reclamation would include pit evaporation or fluid removal, pit backfilling, re-contouring, ripping, spreading top soil, seeding, and weed control. Completions, flare, and cuttings pits would be backfilled and reclaimed within 180 days of completion of work at a well location. Drilling cuttings, mud, and/or completions fluids in the pits would be allowed to dry; however, any free fluids remaining after six months (as weather conditions allow) from reaching total depth, date of completion, or determination of inactivity would be removed to an approved site and the pit reclaimed. Additional drying methods may include sprinkler evaporation. Sprinklers, pumps, and equipment would be installed and operated in a manner to ensure that water spray or mist does not drift. Pits would then be backfilled with spoils and compacted. KMG would not use soils that are moisture laden, saturated, or partially/completely frozen for backfill or cover. KMG would mound the pit area to allow for settling and to promote positive surface drainage away from the pit. In addition, any areas not needed for production operations would be reclaimed and revegetated in accordance with the common reclamation measures listed above.

2.2.9.3. Final Reclamation

As soon as practical after the conclusion of drilling and testing operations, unproductive drill holes would be plugged and abandoned. KMG would plug and abandon all wells per BLM and State of Utah requirements. After plugging, KMG would remove all wellhead equipment

and facilities. All unnecessary equipment, and structures (e.g., cattle guards) and water control structures (e.g., culverts, drainage pipes) not needed to facilitate successful reclamation would also be removed during final reclamation.

KMG would initiate final reclamation at non-producing locations within six months from the date the last well on the pad is plugged. KMG may request a joint inspection by BLM and KMG personnel of the disturbed area to be reclaimed to review the existing conditions, or agree upon a final reclamation plan. KMG would notify the BLM prior to commencement of reclamation operations. KMG would submit Final Reclamation Plans concurrently with the Notice of Intent for Plug and Abandonment procedures for BLM review.

Well pad reclamation utilizing the common reclamation measures above would commence following plugging. Final contouring would blend with and follow as closely as practical the natural terrain and contours of the original site and surrounding areas. After re-contouring the site to the approximate contour that existed prior to pad construction, KMG would conduct final grading over the entire surface of the well site and access road. KMG would rip the area to a depth of 18 to 24 inches on 18 to 24 inch centers, where practical, and would pit the surface soil material with small depressions to form longitudinal depressions 12 to 18 inches deep, where practical. KMG would uniformly cover the entire area with depressions constructed perpendicular to the natural flow of water.

KMG would perform reclamation of roads at the discretion of the BLM. Roads that would be reclaimed would be ripped to a depth of 18 inches where practical, re-contoured to approximate the original contour of the ground, and seeded in accordance with BLM seeding specifications.

Upon successfully completing reclamation of a Plugged and Abandoned location, KMG would submit a Final Abandonment Notice to the BLM.

2.2.10. Applicant-Committed Environmental Protection Measures

KMG adopted applicable COAs from Appendix B, Table B-2, of the GNB ROD (BLM 2012b), as Applicant-Committed Environmental Protection Measures (ACEPMs) for this Proposed Action. Table 1, “Applicant-Committed Resource Protection Measures” (p. 17) identifies ACEPMs from the GNB ROD (BLM 2012b) and other sources that are specific to well pads and development in the Project Area that may become COAs in the Decision Record for the Proposed Action.

Table 2.7. Applicant-Committed Resource Protection Measures

Well Pad/Area	Resource	Resource Protection Measures
Scientifically important fossils and locations of high fossil potential intersect with proposed project components in Section 921-29: well pads 29B, 29C, 29E, 29F, 29G, 29I, 29J, 29K, 29L, 29O; and in Section 921-30: well pads 30I, 30K, 30L, 30M, 30O, and 30P	Paleontology	• Paleontological monitoring by a BLM permitted paleontologist is required during all ground-disturbing activities for proposed development areas found to have scientifically important fossils or in locations of high fossil potential (BLM 2012b).
All proposed well pads and developments in the Project Area	Fish and Wildlife – Migratory Birds	• Bird exclusion netting will be installed over reserve pits containing water that are left open for more than 30 days to reduce possibility of exposure

Well Pad/Area	Resource	Resource Protection Measures
		to hazardous chemicals (BLM 2012b). ● KMG will install bird-excluding devises that prevent the perching and entry of migratory birds on or into its new fired vessel exhaust stacks (BLM 2012b).
Proposed expansions of existing well pads 921-29G, 921-29I, and 921-29J and associated components	Fish and Wildlife – Great Horned Owl Nest	Raptor management will be guided by the use of "Best Management Practices for Raptors and Their Associated Habitats in Utah" (BLM 2008 Appendix A) and "Fluid Minerals Best Management Practices" (BLM 2008 Appendix R), utilizing seasonal and spatial buffers, as well as mitigation, to maintain and enhance raptor nesting and foraging habitat, while allowing other resource uses. ● Construction and development activities will be seasonally limited from 2/1 through 9/31, pending the results of a preconstruction nest occupancy survey (BLM 2008). ● Raptor perch avoidance devices will be installed on all new powerlines and existing lines that present a potential hazard to raptors (BLM 2008).
Proposed new well pads 921-29B and 921-29C, and associated components; proposed buried liquid and gas pipelines associated with proposed expansion of well pad 921-29G	Fish and Wildlife – Golden Eagle Nest	Raptor management will be guided by the use of "Best Management Practices for Raptors and Their Associated Habitats in Utah" (BLM 2008 Appendix A) and "Fluid Minerals Best Management Practices" (BLM 2008 Appendix R), utilizing seasonal and spatial buffers, as well as mitigation, to maintain and enhance raptor nesting and foraging habitat, while allowing other resource uses. ● Construction and development activities will be seasonally limited from 1/1 through 8/31, pending the results of a preconstruction nest occupancy survey (BLM 2008). ● Raptor perch avoidance devices will be installed on all new powerlines and existing lines that present a potential hazard to raptors (BLM 2008).

Well Pad/Area	Resource	Resource Protection Measures
Proposed new well pads 921-29B and 921-29C and associated components; and, the proposed expansion of existing well pad 921-29G and associated components	Fish and Wildlife – Prairie Falcon Nest	Raptor management will be guided by the use of "Best Management Practices for Raptors and Their Associated Habitats in Utah" (BLM 2008 Appendix A) and "Fluid Minerals Best Management Practices" (BLM 2008 Appendix R), utilizing seasonal and spatial buffers, as well as mitigation, to maintain and enhance raptor nesting and foraging habitat, while allowing other resource uses. ● Construction and development activities will be seasonally limited from 4/1 through 8/31, pending the results of a preconstruction nest occupancy survey (BLM 2008). ● Raptor perch avoidance devices will be installed on all new powerlines and existing lines that present a potential hazard to raptors (BLM 2008).
All proposed well pads and developments in the Project Area	Fish and Wildlife – Colorado River Basin Fish Species	● An infiltration gallery will be constructed in a USFWS-approved location. An infiltration gallery is basically a pit or trench dug within a floodplain to a depth below the water table. Water is drawn from the pit rather than from the river directly. If this is not possible, KMG will limit pumping within the river to off-channel locations that do not connect to the river during high spring flows. ● If water cannot be drawn using the measures below, and the pump head will be located in the river channel where larval fish are known to occur, the following measures will apply (BLM 2012b): ● KMG will avoid pumping from low-flow or no-flow areas as these habitats tend to concentrate larval fishes; ○ KMG will avoid pumping to the greatest extent possible, during that period of the year when larval fish may be present (approximately April 1 to August 31); ○ KMG will avoid pumping, to the greatest extent possible, during

Well Pad/Area	Resource	Resource Protection Measures
		the midnight hours (10:00 pm to 2:00am) as larval drift studies indicate that is a period of greatest daily activity. Dusk is the preferred pumping time as larval drift abundance is lowest. ○ KMG will screen all pump intakes with 3/32-inch mesh material.
Source: GNB ROD (BLM 2012b), Vernal RMP (2008a)		

2.3. No Action Alternative

Under the No Action Alternative, the BLM would deny the Proposed Action described in this EA. Currently approved drilling and completion of wells and development of infrastructure would continue as described in approved decision documents. Selection of the No Action Alternative would not preclude other oil and gas activities or proposals within the Project Area. Development of existing well pads, roads, and pipelines in the Project Area has resulted in approximately 59.55 acres of surface disturbance. Refer to Table 2.1, "Proposed Action Development and Surface Disturbance Summary" (p. 8) and Appendix C for additional information on existing surface disturbance in the Project Area.

2.4. Alternatives Considered but Eliminated from further Analysis

BLM considered combining the NBU 921–29B and the NBU 921–29C well pads due to their close proximity. Between the two locations, there are 13 well bores proposed. The combined well pad would need to be greatly expanded to accommodate the second row of well bores. There are already cuts and fills of more than 10 feet. Due to the terrain in the area the cuts and fills would be greatly increased, and would also cut off drainages. The large cuts and fills create unsafe working condition on the well location. Also, Kerr McGee's Greater Natural Buttes EIS (BLM 2012) has been analyzed for, and authorizes 1 well pad per quarter-quarter within the EIS boundaries. This project falls within those boundaries. Although the well pads are close together, they are in separate quarter-quarters. Therefore due to safety, watershed issues, and EIS analysis this alternative has been eliminated from further analysis.

Chapter 3. Affected Environment

This page intentionally
left blank

The affected environment of the Project Area was evaluated by a BLM ID team, as documented in the ID Team Checklist (Appendix A). The checklist indicates which resources of concern are present, which resources would be affected by the alternatives and require analysis in the EA, and which resources are either not present in the Project Area or would not be affected to a degree that requires detailed analysis. The description of the affected environment in this section focuses on those resources identified as "PI" (present with potential for relevant impact that need to be analyzed in detail in the EA) in the ID Team Checklist (Appendix A).

Mineral extraction activities, livestock grazing, and associated surface disturbance have historically affected the Project Area. The 115 proposed new wells, 14 well pad expansions, eight new well pads, and construction of gas and liquid gathering pipelines would occur in the Natural Buttes Unit on BLM-administered lands in the BLM Utah Vernal Field Office. This EA is tiered to the GNB ROD (BLM 2012b), and incorporates the GNB Final EIS (BLM 2012a) by reference; as a result, this chapter summarizes and cites the affected environment description from the GNB Final EIS (BLM 2012a) and provides additional site-specific information, where appropriate.

3.1. Air Quality and Greenhouse Gas Emissions

3.1.1. Climate

The Project Area is located in the Uinta Basin, a semiarid, mid-continental climate regime typified by dry, windy conditions and limited precipitation and wide seasonal temperature variations subject to abundant sunshine and rapid nighttime cooling. The Uinta Basin is designated as unclassified/attainment by the EPA under the Clean Air Act. This classification indicates that the concentration of criteria pollutants in the ambient air is below National Ambient Air Quality Standards (NAAQS), or that adequate air monitoring is not available to determine attainment. Refer to Section 3.1.1 (pages 3-2 through 3-3) in the GNB Final EIS (BLM 2012a) for additional information on climate in the region.

NAAQS are standards that have been set for the purpose of protecting human health and welfare with an adequate margin of safety. Pollutants for which standards have been set include ground level ozone, (O3), sulfur dioxide (SO2), nitrogen dioxide (NO2), and carbon monoxide (CO), and particulate matter less than 10 microns in diameter (PM10) or 2.5 microns in diameter (PM2.5). Airborne particulate matter consists of tiny coarse-mode (PM10) or fine-mode (PM2.5) particles or aerosols combined with dust, dirt, smoke, and liquid droplets. PM2.5 is primarily derived from the incomplete combustion of fuel sources and secondarily formed aerosols, whereas PM10 is primarily from crushing, grinding, or abrasion of surfaces. Table 3.1, "Ambient Air Quality Background Values" (p. 24) lists ambient air quality background values for the Uinta Basin and NAAQS standards.

Table 3.1. Ambient Air Quality Background Values

Pollutant	Averaging Period(s)	Uinta Basin Background Concentration (µg/m^3)	NAAQS (µg/m^3)[7]
SO_2	Annual	0.8[2]	--[1]
	24-hour	3.9[2]	--[1]
	3-hour	10.1[2]	1,300
	1-hour	19.0[2]	197
NO_2	Annual	8.1[3]	100
	1-hour	60.2[3]	188
PM_{10}	Annual	7.0[4]	--[6]
	24-hour	16.0[4]	150
$PM_{2.5}$	Annual	9.4[3]	15
	24-hour	17.8[3]	35
CO	8-hour	3,450[4]	10,000
CO	1-hour	6,325[4]	40,000
O_3	8-hour	100.0[3,5]	75

[1]The 24-hour and annual SO_2 NAAQS have been revoked by USEPA
[2]Based on 2009 data from Wamsutter Monitoring Station Data (USEPA AQS Database)
[3]Based on 2010/2011 data from Redwash Monitoring Station (USEPA AQS Database)
[4]Based on 2006 data disclosed in the Greater Natural Buttes FEIS. (BLM 2012)
[5]Ozone is measured in parts per billion (ppb)
[6]The annual PM_{10} NAAQS has been revoked by USEPA
[7]Source: BLM 2014

µg/m^3 micrograms per cubic meter
CO carbon monoxide
NO_2 nitrogen dioxide
O_3 ozone
PM_{10} and $PM_{2.5}$ particle pollution
SO_2 sulfur dioxide

3.1.2. Air Quality and Greenhouse Gas Emissions

Existing point and area sources of air pollution within the Uinta Basin include the following:

- Exhaust emissions (primarily CO, nitrogen oxides [NOX], PM2.5, and hazardous air pollutants [HAPs]) from existing natural gas fired compressor engines used in transportation of natural gas in pipelines;
- Natural gas dehydrator still-vent emissions of CO, NOX, PM2.5, and HAPs;
- Gasoline and diesel-fueled vehicle tailpipe emissions of volatile organic compounds (VOCs), NOX, CO, sulfur dioxide (SO2), PM10, and PM2.5;
- Oxides of sulfur oxides (SOX), NOX, fugitive dust emissions from coal-fired power plants, and coal mining/ processing;

- Fugitive dust (in the form of PM10 and PM2.5) from vehicle traffic on unpaved roads, wind erosion in areas of soil disturbance, and road sanding during winter months; and,

- Long-range transport of pollutants from distant sources.

The EPA established two year-round air quality-monitoring sites in summer 2009 near Redwash (southeast of Vernal, Utah) and Ouray (southwest of Vernal). The monitors were certified as Federal Reference Monitors in the fall of 2011. These monitors can be used to make NAAQS compliance determinations. The complete EPA Ouray and Redwash monitoring data can be found at http://www.epa.gov/airdata/.

Both monitoring sites have recorded numerous exceedances of the 8-hour ozone standard during the winter months (January through March 2010, 2011, and 2013). It is thought that high concentrations of ozone are being formed under a "cold pool" process. This process occurs when stagnant air conditions form with very low mixing heights under clear skies, with snow-covered ground and abundant sunlight. These conditions, combined with area precursor emissions (NOX and VOCs), can create intense episodes of ozone. The high ozone numbers did not occur during January through March of 2012 due to a lack of snow cover. This phenomenon has also been observed in similar locations in Wyoming. Winter ozone formation is a newly recognized issue, and the methods of analyzing and managing this problem are still being developed. Existing photochemical models are currently unable to replicate winter ozone formation reliably. This is due to the very low mixing heights associated with the unique meteorology of the ambient conditions. Further research is needed to definitively identify ozone precursor sources that contribute to observed ozone concentrations.

The Utah Department of Air Quality (UDAQ) conducted limited monitoring of PM2.5 in Vernal, Utah, in December 2006. During the 2006-2007 winter season, PM2.5 levels were higher than the PM2.5 health standards that became effective in December 2006. The PM2.5 levels recorded in Vernal were similar to other areas in northern Utah that experience wintertime inversions. The most likely causes of elevated PM2.5 at the Vernal monitoring station are those common to other areas of the western U.S. (combustion and dust) plus nitrates and organics from oil and gas activities in the Basin. PM2.5 monitoring that has been conducted in the vicinity of oil and gas operations in the Uinta Basin by the Redwash and Ouray monitors beginning in summer 2009 have not recorded any exceedances of either the 24-hour or annual NAAQS.

HAPs are pollutants that are known or suspected to cause cancer or other serious health effects, such as reproductive effects or birth defects, or adverse environmental impacts. The EPA has classified 187 air pollutants as HAPs. Examples of listed HAPs associated with the oil and gas industry include formaldehyde, benzene, toluene, ethylbenzene, isomers of xylene (BTEX) compounds, and normal-hexane (n-hexane). There are no applicable federal or state ambient air quality standards for assessing potential HAP impacts to human health. Refer to Section 3.1 (pages 3-2 through 3-13) in the GNB Final EIS (BLM 2012a) for additional information on air quality conditions relevant to the Project Area.

3.1.2.1. Greenhouse Gases

Greenhouse gases keep the planet's surface warmer than it otherwise would be. However, as concentrations of these gases increase, the Earth's temperature is climbing above past levels. According to National Oceanic and Atmospheric Administration (NOAA) and National Aeronautics and Space Administration (NASA) data, the Earth's average surface temperature has

increased approximately 1.2 to 1.4 degrees Fahrenheit in the last 100 years. The eight warmest years on record (since 1850) have all occurred since 1998, with the warmest year being 1998. However, according to the British Meteorological Office's Hadley Centre (BMO 2009), the United Kingdom's foremost climate change research center, the mean global temperature has been relatively constant for the past nine years after the warming trend from 1950 through 2000. Predictions of the ultimate outcome of global warming remain to be seen.

The analysis of the Regional Climate Impacts prepared by the U.S. Global Change Research Program (USGCRP) (2009) suggests that recent warming in the region (including the Project Area) was nationally among the most rapid. Past records and future projections predict an overall increase in regional temperatures, largely in the form of warmer nights and effectively higher average daily minimum temperatures. They conclude that this warming is causing a decline in spring snowpack and reduced flows in the Colorado River. The USGCRP projects a region-wide decrease in precipitation, although with substantial variability in interannual conditions. For eastern Utah, the projections range from an approximate five (5) percent decrease in annual precipitation to decreases as high as 40 percent of annual precipitation. Refer to Section 3.1.3.7 (pages 3-12 through 3-13) in the GNB Final EIS (BLM 2012a) for more information on climate change.

3.2. Invasive Plants/Noxious Weeds, Soils, and Vegetation

3.2.1. Vegetation and Invasive Plants/Noxious Weeds

Vegetation in the Project Area vicinity consists predominantly of a mixed desert shrub community. Table 3.2, "Plant Species Observed in the Project Area" (p. 26) identifies common plant species which occur within or near the Project Area.

Table 3.2. Plant Species Observed in the Project Area

Scientific Name	Common Name
Shrubs	
Atriplex canescens	*Four-winged saltbush*
Atriplex confertifolia	*Shadscale*
Atriplex corrugata	*Mat saltbush*
Atriplex gardneri	*Gardner's saltbush*
Artemisia spp.	*Sagebrush species*
Ceratoides lanata	*Winterfat*
Chrysothamnus spp.	*Rabbitbrush species*
Ephedra torreyana	*Mormon tea*
Sarcobatus vermiculatus	*Greasewood*
Tetradymia spinosa	*Horsebrush*
Cacti	
Opuntia sp.	Prickly pear cactus
Grasses and Forbs	
Agropyron dasystachyum var. dasystachyum	Thickspike wheatgrass
Allium textile	Textile onion
Arenaria spp.	Sandwort
Cleome lutea	Yellow beeplant
Cymopterus spp.	Spring parsley
Eriogonum inflatum	Desert trumpet
Descurainia pinnata	Tansy mustard

Scientific Name	Common Name
Hilaria jamesii	Galleta
Phacelia crenulata	Scorpionweed
Phlox spp.	Phlox
Sphaeralcea spp.	Globemallow
Sporobolus airoides	Alkali sacaton
Stipa hymenoides	Indian ricegrass
Invasive Species	
Halogeton glomeratus	Halogeton
Bromus tectorum	Cheatgrass
Salsola kali	Russian Thistle
Source: Grasslands Consulting 2014	

Refer to Section 3.11 (pages 3-78 through 3-88) in the GNB Final EIS (BLM 2012a) for more information on vegetation and invasive/noxious weed species relevant to the Project Area.

3.2.2. Soils

The Project Area is underlain by sedimentary deposits of the Uinta Formation at elevations ranging from approximately 5,080 to 5,250 feet. Soils in the area consist predominantly of stony loam and clay loam. The terrain is rolling hills, and the proposed wells and associated infrastructure would be located primarily on rolling hills (BLM 2012d). The Project Area is located primarily in areas with high constraint soils, as identified in the GNB Final EIS (BLM 2012a), which pose the greatest construction and reclamation constraints compared to other soil types characterized in the GNB Final EIS (BLM 2012a).

3.3. Paleontology

Fossils on federal lands are protected under provisions of FLPMA, as amended, 43 U.S.C. 1737(b), PL 94-579; PL 111-011, Omnibus Public Land Management Act of 2009, Subsection D, Section 6302; and 43 CFR 3802 and 3809 (BLM 2012a). The BLM uses a Potential Fossil Yield Classification (PFYC) system of geologic units with respect to their potential for the production of scientifically important fossils, which ranges from PFYC 1 (lowest fossil potential) to PFYC 5 (highest fossil potential).

The Project Area is located entirely in the Uinta Formation of the Middle Eocene Age, which has a PFYC of 4 (high) to 5 (very high). The Uinta formation is composed of exposed bedrock and noted as a source of scientifically important vertebrate fossils (BLM 2012a). The Quaternary Sediments formation is comprised of alluvial and eolian deposits; fossils of scientific importance have not been recovered from these units (BLM 2012a).

In August 2014, a paleontological survey was conducted within the Project Area (SWCA 2014). Based on the recent survey, 18 previously documented fossil localities and several locations of high fossil potential areas are located in Township 9 S, Range 21 E, Sections 29 and 30. Refer to Section 3.5 (pages 3-34 through 3-37) of the GNB Final EIS (BLM 2012a) for additional information on paleontological resources in the GNBPA.

Paleontological resource assessment surveys were conducted by SWCA for 8 new well pad locations (29B, 29C, 29F, 30L, 30M, 30N, 30O, 30P) and 14 well pad expansions (29E, 29G, 29I, 29J, 29K, 29L, 29N, 29O, 30A, 30D, 30F, 30G, 30I) in Section 29, T9S, R21E and Section 30, T9S, R21E. Scientifically important fossils and locations of high fossil potential were discovered

at or near locations 29F, 29G, 29I, 29J, 29K, 29L, 29O, 30I, 30K, 30L, 30O, and 30P during the survey.

3.4. Wildlife

3.4.1. Migratory Birds (including raptors)

The Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act were implemented for the protection of migratory birds and eagles. Unless permitted by regulations, the MBTA makes it unlawful to pursue, hunt, kill, capture, possess, buy, sell, purchase, or barter any migratory bird, including the feathers or other parts, nests, eggs, or migratory bird products. In addition to the MBTA, Executive Order 13186 sets forth the responsibilities of federal agencies to further implement the provisions of the MBTA by integrating bird conservation principles and practices into agency activities and by ensuring that federal actions evaluate the effects of actions and agency plans on migratory birds. Pursuant to Executive Order 13186, a Memorandum of Understanding (MOU) (BLM MOU WO-230-2010-04[BLM 2010]) between the BLM and USFWS outlined a collaborative approach to promote the conservation of migratory bird populations and avoid or minimize adverse impacts on migratory birds in coordination with state, tribal, and local governments. Based on recent Project Area Geographic Information System (GIS) information, there are eight known active or inactive raptor nests located within 0.25 to 0.50 miles of surface disturbance areas associated with the Project which include golden eagle (*Aquila chrysaetos canadensis*), prairie falcon (*Falco mexicanus*), and great horned owl (*Bubo virginianus*).

Migratory bird species commonly associated with the mixed desert shrub community within the Project Area include the mountain bluebird (*Sialia currocoides*), brewer's sparrow (*Spizella breweri*), sage sparrow (*Amphispiza belli*), sage thrasher (*Oreoscoptes montanus*), gray vireo (*Vireo viciunior*), gray flycatcher (*Empidonax wrightii*), green-tailed towhee (*Pipilo chlorurus*), horned lark (*Eremophila alpestris),* loggerhead shrike (*Lanius ludovicianus*), western kingbird (*Tyrannus verticalis*), northern mockingbird (*Mimus polyglottos*), vesper sparrow (*Pooecetes gramineus*), and western meadowlark (*Sturnella neglecta*) (Parrish 2002).

Common raptor species that breed in the region include the golden eagle, ferruginous hawk (*Buteo regalis*), red-tailed hawk, Cooper's hawk (*Accipiter cooperii*), sharp-shinned hawk (*Accipiter striatus*), northern harrier (*Circus cyaneus*), prairie falcon, American kestrel (*Falco sparverius*), great-horned owl, burrowing owl, and long-eared owl (*Strix otus*) (BLM 2008b).

Refer to Section 3.15.1.2 (pages 3-125 through 3-134) of the GNB Final EIS (BLM 2012a) for additional information on other migratory birds and raptors that may inhabit the region.

3.4.1.1. Golden Eagle (*Aquila chrysaetos canadensis*)

The golden eagle is considered a permanent resident of Utah with primary habitat typically found in open country, prairies, shrub-lands, canyons/cliffs, mountainous areas, open wooded country, and barren areas, especially in hilly or mountainous regions. In addition to the MBTA, the golden eagle is also protected under the Bald and Golden Eagle Protection Act of 1940 (16 U.S.C. 668-668c). Golden eagle nests are typically found on rock ledges on cliffs or in large trees. Pairs may have several alternate nests used in different years, or may use the same nest in consecutive years.

Based on GIS mapping, there are three known golden eagle nests located outside of the Project Area, directly adjacent to the northern boundary of the Project Area in Township 9S, Range 21E, Section 20. In accordance with the BLM Vernal Approved RMP and ROD (BLM 2008a), raptor nests have an associated protective seasonal and spatial buffer around the nests which limit surface-disturbing activities, including activities such as pipelines and construction activities based on species-specific breeding requirements.

Per the BLM Vernal Approved RMP and ROD, surface-disturbing activities, occurring outside of the seasonal buffer, but within the spatial buffer of an unoccupied nest would be allowed during a three-year nest monitoring period, provided the activity would not cause the nest site to become unsuitable for future nesting as determined by a BLM wildlife biologist (BLM 2008a). If the nests are determined to be occupied by golden eagles, the seasonal protective buffer would limit surface disturbing activities within 0.5-mile of nest locations between January 1 and August 31 (BLM 2008a). The seasonal protective buffer associated with the onsite nest location overlaps locations of proposed Project Area activities and buried pipeline locations for proposed well pad locations NBU 921-29B and NBU 921-29C, and proposed liquid and gas pipelines associated with NBU 921-29G. Pre-construction raptor nest surveys will be required to confirm nest occupancy and the need for seasonal protection. The BLM can grant a surface disturbance exception within an established buffer area if the raptor nests are determined not to be occupied.

3.4.1.2. Prairie Falcon (*Falco mexicanus*)

Prairie falcons inhabit shortgrass prairie, buttes, sandstone cliffs, open sage, alkali flats, and alpine tundra. Populations do not migrate long distances, but some birds move from breeding grounds to lower elevations, where prey availability is higher, during the winter. The diet of the prairie falcon includes small mammals, songbirds, and reptiles.

Based on GIS mapping, there are three known prairie falcon nests within the Project Area, located east and southeast of proposed well pad locations NBU 921-29B and NBU 921-29C in Township 9 S, Range 21 E, Section 29. In accordance within the BLM Vernal RMP ROD (BLM 2008a), all raptor nests have an associated protective seasonal and spatial buffer around the nests which limits short duration surface-disturbing activities, including activities such as pipeline or powerline constructions, seismic exploration activity, vegetative treatments, fence or reservoir construction, and permitted recreational events based on species-specific breeding requirements. The seasonal protective buffer for prairie falcons limits surface-disturbing activities within 0.25 mile of nest locations between April 1 and August 31. The seasonal protective buffer associated within these nest locations overlap locations of proposed Project Area activities and buried pipeline locations for proposed well pad locations NBU 921-29B and NBU 921-29C, and the proposed expansion of existing well pad location NBU 921-29G. Pre-construction raptor nest surveys may be required to confirm nest occupancy and need for seasonal protection. The BLM can grant a onetime surface disturbance exception within an established buffer area if the raptor nest is determined not to be active.

Refer to Section 3.15.1.2 (pages 3-125 to 3-126) of the GNB Final EIS (BLM 2012a) for additional information on the prairie falcon.

3.4.1.3. Great Horned Owl (*Bubo virginianus*)

The great horned owl is a common species found in Utah that hunts in fields and forests for medium-sized mammals such as rabbits and skunks. During the day, the great horned owl roosts

in trees, including pinyon-juniper woodlands and deciduous trees, or cliff edges, mesa tops and rock outcrops.

Based on GIS mapping, there are two known great horned owl nests located within the Project Area, located directly adjacent to proposed well pad NBU 921-29B and existing well pad location NBU 921-29I in Township 9 S, Range 21 E, Section 29. In accordance with the BLM Vernal RMP ROD (BLM 2008a), all raptor nests have an associated protective seasonal and spatial buffer around the nests which limits short duration surface-disturbing activities, including activities such as pipeline or powerline construction, seismic exploration activity, vegetative treatments, fence or reservoir construction, and permitted recreational events based on species-specific breeding requirements. The seasonal protective buffer for great horned owl limits surface-disturbing activities within 0.25 mile of nest locations between December 1 and September 31. The seasonal protective buffer associated with this nest location overlaps with locations of proposed Project Area activities and buried pipeline locations for proposed well pad locations NBU 921-29B and NBU 921-29C and proposed expansion of well pad locations NBU 921-29G, NBU 921-29I and NBU 921-29J. Pre-construction raptor nest surveys may be required to confirm nest occupancy and need for seasonal protection. The BLM can grant a onetime surface disturbance exception within a established buffer area if the raptor nest is determined not to be active.

Refer to Section 3.15.1.2 (pages 3-125 to 3-126) of the GNB Final EIS (BLM 2012a) for additional information on the great horned owl.

3.4.2. Non-USFWS Designated Wildlife

Wildlife species and habitats occurring within the Project Area are typical of the intermontane zone of the East Tavaputs Plateau. This area has highly varied topography of sand/gravel washes, dry upland benches, rocky cliffs, and outcroppings (BLM 2012a).

The Utah Department of Environmental Quality (UDEQ) designates the Green River near Ouray and the White River from the Green River confluence to the Colorado state line as warm water fisheries (Utah Administrative Code 2007). However, channel catfish were the most abundant game species identified from previous electrofishing and fyke/trammel net surveys (Bestgen et al. 2007; Irving and Modde 1994). Other game fish species generally occur in relatively low numbers in the Green River near Ouray and the White River from the Green River confluence to the Colorado state line. Native fish species that occur in the Green and White rivers include Colorado pikeminnow (endangered), razorback sucker (endangered), bonytail (endangered), humpback chub (endangered), flannelmouth sucker (state sensitive), bluehead sucker (state sensitive), roundtail chub (state sensitive), mottled sculpin, and speckled dace (Monroe 2007). Native fish, such as flannelmouth sucker and bluehead sucker, and introduced species such as carp, channel catfish, and red shiner were the most abundant fish species identified during previous surveys (Bestgen et al. 2007; Irving and Modde 1994).

3.4.3. Wildlife – Threatened, Endangered, Proposed, or Candidate

An endangered species is a species listed under the Endangered Species Act (ESA) as being in danger of extinction throughout all or a portion of its range. A threatened species is a species listed under the ESA as likely to become endangered within the foreseeable future throughout all or a portion of its range. Special status species are species that are candidates to list pursuant to the ESA, or sensitive species designated by the BLM or the State of Utah.

In accordance with the ESA, as amended, the lead agency in coordination with the USFWS must ensure that any federal action to be authorized, funded, or implemented would not adversely affect a federally listed threatened or endangered species or its critical habitat. The BLM policy in Manual 6840, Special Status Species Management, requires the BLM to manage and protect any USFWS candidate species, state sensitive species, or State of Utah species of concern to prevent the need for future federal listing as threatened or endangered.

The BLM conducted consultation with the USFWS on threatened and endangered animal species during preparation of the GNB Final EIS. Refer to Appendix D of the GNB ROD (BLM 2012b) for the Final Biological Opinion, which describes USFWS and BLM consultation, status and description of species and critical habitat, potential effects, surveys and monitoring, resource protection measures, and other information associated with threatened, endangered, and candidate animal species.

3.4.3.1. Colorado River Fish Species

The BLM has identified seven special status fish species that are historically associated with the Upper Colorado River Basin and its tributaries. Special status fish species include those fish species federally listed as threatened, endangered, proposed and/or candidate, as well as BLM sensitive species and State of Utah species of concern. Federal and state listed species include the Colorado pikeminnow (*Ptychocheilus lucius*), humpback chub (*Gila cypha*), bonytail (*Gila elegans*), and razorback sucker (*Xyrauchen texanus*). These fish have experienced severe population declines due to flow alterations, habitat loss or alteration, and introduction of non-native fish species. The flannelmouth sucker (*Catostomus latipinnis*), roundtail chub (*Gila robusta*) and bluehead sucker (*Catostomus discobolus*) are state sensitive species due to declining population numbers and distribution, and they receive special management under a conservation agreement in order to preclude the need for a federal listing. The Project Area does not occur within critical habitat for the Colorado River Basin listed fish species. Refer to Section 3.15.2.2 (pages 3-134 through 3-136) of the GNB Final EIS (BLM 2012a) for more information on the special status fish species.

3.5. Livestock Grazing and Rangeland Health Standards

3.5.1. Livestock Grazing

The Project Area is located in the Sand Wash Grazing Allotment, which is used for cattle grazing from November 30 through April 30 (Table 3.3, “Sand Wash Allotment Information” (p. 31)).

Table 3.3. Sand Wash Allotment Information

Allotment Name	Livestock Number	Livestock Kind	Period of Use		Type Use	Animal Unit Months (AUMs)
			Begin	End		
Sand Wash	1,191	Cattle	11/30	4/30	Active	4,523
Source: BLM 2008a						

The allotment is primarily located within the semi-arid saltshrub ecosystem, which is characterized by native low-lying shrubs, grasses and forbs in its undisturbed condition. Disturbed areas of the Sand Wash Allotment are currently characterized by invasive weeds such as halogeton (*Halogeton glomeratus*) and cheat grass (*Bromus tectorum*) as well as bare ground. The

allotment is currently dissected by hundreds (possibly thousands) of miles of pipelines, roads and road spurs, as well as other infrastructure such as compressor stations, which are characteristic of dense oil and gas development.

The current livestock operator has been unable to utilize the full permitted animal unit months (AUMs) within the allotment due to the current level of disturbance, fragmentation, daily traffic and development. However, the operator continues to pay bills associated with those AUMs to maintain a billing history.

Previous development within the Project Area has resulted in approximately 59.55 acres of existing surface disturbance (Table 3.3, "Sand Wash Allotment Information" (p. 31)) in the Sand Wash Allotment. The 59.55 acres of existing disturbance has resulted in a projected loss of 6.3 AUMs in the Sand Wash Allotment. There are no identified range improvements in the Project Area.

3.5.2. Rangeland Health Standards

The BLM Utah Rangeland Health Standards address four conditions that must be met in order to achieve the Fundamentals of Rangeland Health. These include: 1) soil productivity, 2) riparian/wetland function, 3) desired species composition, and 4) water quality standards. Utah Guidelines for Grazing Management include management practices that can be applied to achieve Utah's standards.

The Sand Wash Allotment is currently managed under a 2012 BLM-approved grazing permit. The 2008 Vernal RMP and Final EIS (BLM 2008b) indicates that the management category for the Sand Wash Allotment is "M" (Maintain Existing Resource Conditions).

Rangeland Health Standards have been assessed for the Sand Wash Allotment. During the 2014 field season standards were assessed and contiguous sections of ecological sites were considered meeting standards outside of the energy development areas. Noted during the assessments were the large portions of the vegetative surface that has been removed and/or disturbed as a result of the development of oil and gas resources in the area. Over the last recent energy boom (2005 to present), there has been a large increase in the level of disturbance as a result of oil and gas development in the area.

Chapter 4. Environmental Impacts

This page intentionally
left blank

The analysis in this chapter is tiered to the GNB ROD (BLM 2012b), incorporates by reference the analysis in the GNB Final EIS (BLM 2012a), and provides additional site-specific analysis and information, where appropriate, to inform decision-making on this specific development proposal. Environmental impacts are only discussed for resources identified as "PI" (present with potential for relevant impact that need to be analyzed in detail in the EA) in the ID Team Checklist (Appendix A).

4.1. Proposed Action Environmental Impacts

This section analyzes the impacts of the Proposed Action on the potentially impacted resources described in the affected environment chapter (Chapter 3).

4.1.1. Air Quality and Greenhouse Gas Emissions

This Proposed Action is considered a minor air pollution source under the Clean Air Act and is not controlled by regulatory agencies. At present, control technology is not required by regulatory agencies since the Uinta Basin is designated as unclassified/attainment. The Proposed Action would result in different emission sources associated during the two project phases: well development and well production. Annual estimated emissions from the Proposed Action are summarized in Table 4.1, "Proposed Action Annual Emissions (tons/year)" (p. 35). Refer to Section 4.1 (pages 4-2 through 4-24) in the GNB Final EIS (BLM 2012a) for more information on potential air quality impacts.

Table 4.1. Proposed Action Annual Emissions (tons/year)

Pollutant	Development[1,2]	Production[1]	Total[1,3]
NO_X	83.60	37.77	121.37
CO	48.40	24.36	72.76
VOC	2.20	184.50	186.70
SO_2	0.11	6.17	6.28
PM_{10}	37.40	7.87	45.27
$PM_{2.5}$	8.80	6.85	15.65
Benzene	4.84E-02	8.04	8.09
Toluene	3.52E-02	9.40	9.44
Ethylbenzene	7.48E-03	6.17	6.18
Xylene	2.42E-02	7.53	7.55
n-Hexane	3.74E-03	14.67	14.67
Formaldehyde	0.29	6.00	6.29

[1]Emissions include 115 producing wells and associated operations traffic during the year in which the project is developed.
[2]Development emissions would likely only occur during the first year while wells and other infrastructure are being developed.
[3]Total emissions after the first year would be substantially lower following completion of development

CO Carbon monoxide
NO_X Oxides of Nitrogen
$PM_{2.5}$ Particulate Matter less than 2.5 microns in diameter
PM_{10} Particulate Matter less than 10 microns in diameter
SO_2 Sulfur dioxide
VOC Volatile Organic Compound

Well development includes NOX, SO2, and CO tailpipe emissions from earth-moving equipment, vehicle traffic, drilling, and completion activities. Fugitive dust concentrations would occur from

vehicle traffic on unpaved roads and from wind erosion where soils are disturbed. Drill rig and fracturing engine operations would result mainly in NOX and CO emissions, with lesser amounts of SO2. These emissions would be short-term during the drilling and completion phases.

During well production, continuous NOX, CO, VOC, and HAP emissions would originate from well pad separators, condensate storage tank vents, and daily tailpipe and fugitive dust emissions from operations traffic. Road dust (PM10 and PM2.5) would also be produced by vehicles servicing the wells.

Under the Proposed Action, emissions of NOx and VOC, ozone precursors, would be 121.37 tons per year for NOx, and 186.70 tons per year of VOC (Table 4.1, "Proposed Action Annual Emissions (tons/year)" (p. 35)). Emissions would be dispersed and/ or diluted to the extent where any local ozone impacts from the Proposed Action would be indistinguishable from background conditions.

The primary sources of HAPs would be from oil storage tanks and smaller amounts from other production equipment. Small amounts of HAPs would also be emitted by construction equipment. These emissions are estimated to be minor and would be less than 1 ton per year.

4.1.1.1. Greenhouse Gases

The assessment of greenhouse gas emissions and climate change remains in its earliest stages of formulation. Applicable EPA rules do not require any controls and have yet to establish any emission limits related to GHG emissions or impacts. The lack of scientific models that predict climate change on a regional or local level prohibits the quantification of potential future impacts of decisions made at the local level, particularly for small-scale projects such as the Proposed Action. Drilling and development activities from the Proposed Action are anticipated to release a negligible amount of greenhouse gases into the local airshed.

Mitigation Measures for Air Quality and Greenhouse Gas Emissions

This EA tiers to and incorporates the COAs and mitigation measures included in Appendix B of the GNB ROD (BLM 2012b). No additional mitigation measures were identified for air quality during preparation of this EA.

4.1.2. Invasive Plants/Noxious Weeds, Soils, and Vegetation

4.1.2.1. Plant Species, Excluding U.S. Fish and Wildlife Designated Species, and Invasive Plants/Noxious Weed Species

The Proposed Action would disturb an estimated 98.39 acres of habitat, primarily in mixed desert shrub communities. Direct impacts to vegetation would primarily associated with clearing of vegetation during construction and degradation of habitat through soil compaction and loss of topsoil. Indirect impacts to vegetation resources may include the invasion and establishment of introduced, undesired plant species and increased deposition of dust on plants. The severity of impacts resulting from spread and establishment of invasive plants and noxious weeds would depend on the success of reclamation and revegetation and the degree and success of noxious weed control efforts. Refer to Section 4.11.3 (page 4-114) of the GNB Final EIS (BLM 2012a) for more information on potential impacts to vegetation.

To minimize potential impacts to vegetation, KMG has committed to the COAs for soils, vegetation, and weed management, the Reclamation Plan from the GNB ROD Appendix B, Table B-2 (BLM 2012b), and the Green River District Reclamation Guidelines (BLM 2011).

Mitigation Measures for Vegetation and Invasive Plants/Noxious Weeds

This EA tiers to and incorporates the COAs and mitigation measures included in Appendix B of the GNB ROD (BLM 2012b). Refer to Section 2.2.10 (*Applicant Committed Environmental Protection Measures*) of this EA for COAs that are specific to well pads and development in the Project Area. No additional mitigation measures were identified for vegetation during preparation of this EA.

4.1.2.2. Soils

The Proposed Action would disturb an estimated 98.39 acres of soils, primarily in high constraint soils, as identified in the GNB Final EIS (BLM 2012a). High constraint soils pose limitations to successful implementation of reclamation measures and long-term maintenance of protective and productive vegetative cover.

Potential direct impacts to 98.39 acres of soils include mixing of soil horizons, soil compaction, short-term loss of topsoil and site productivity, contamination of soils with petroleum products, loss of soil/topsoil through wind and water erosion, and vegetation loss. Loss of soil/topsoil in disturbed areas would increase competition by annual weed species with native species. Annual weed species are adapted to disturbed conditions, and have less stringent moisture and soil nutrient requirements than do perennial native species. Refer to Section 4.9.3 (pages 4-93 through 4-95) of the GNB Final EIS (BLM 2012a) for more information on potential impacts to soils.

To minimize potential impacts to soils, KMG has committed to the COAs for soils and the Reclamation Plan from the GNB ROD Appendix B, Table B-2 (BLM 2012b); and the Green River District Reclamation Guidelines (BLM 2011).

Mitigation Measures for Soils

This EA tiers to and incorporates the COAs and mitigation measures included in Appendix B of the GNB ROD (BLM 2012b). Refer to Section 2.2.10 (*Applicant Committed Environmental Protection Measures*) of this EA for COAs that are specific to well pads and development in the Project Area. No additional mitigation measures were identified for soils during preparation of this EA.

4.1.3. Paleontology

The Proposed Action would result in approximately 98.39 acres of surface disturbance from the development of 8 new well pads, the expansion of 14 well pads and development of access roads and pipelines. All proposed project activities would occur on the Uinta Formation of the Middle Eocene Age, which has a PFYC of 4 (high) to 5 (very high). A total of eighteen previously discovered fossil localities occur within the Project Area. Based on the project location within a PFYC 4 to 5 area and presence of previously observed fossils, additional fossil locations and occurrences may be encountered during project related construction. Additionally, based on recent paleontological on-site surveys, the proposed activities associated with all other well pads in Township 9S, Range 21 E, Sections 29 and 30 occur within locations identified as high

fossil potential areas (SWCA 2014). Therefore, proposed project activities may result in direct impacts to existing, undiscovered paleontological resources in Sections 921-29 and 30. Direct impacts to paleontological resources are primarily associated with loss of vertebrate fossils from surface-disturbing activities, illegal collecting, and potential vandalism. Refer to Section 4.5 (4-38 through 4-39) in the GNB Final EIS (BLM 2012a) for additional information on potential impacts to paleontological resources.

To minimize potential impacts to paleontological resources, KMG has committed to the COAs for Paleontological Resources from the GNB ROD Appendix B, Table B-2 (BLM 2012b).

Conditions of Approval and Mitigation Measures for Paleontology

This EA is tiered to and incorporates the COAs and mitigation measures included in Appendix B of the GNB ROD (BLM 2012b). Due to the potential for scientifically important fossils and locations of high fossil potential, several development locations will require a paleontological monitor during construction. Refer to Section 2.2.10 (*Applicant Committed Environmental Protection Measures*) of this EA for COAs that are specific to well pads and development in the Project Area.

4.1.4. Wildlife

4.1.4.1. Migratory Birds (including raptors)

The Proposed Action would result in an estimated 98.39 acres of disturbance and loss of potential breeding, nesting, and foraging habitat for migratory birds and raptors. Direct impacts would include loss and degradation of potential breeding, nesting, and foraging habitat; displacement of migratory birds and prey from suitable habitats due to surface disturbance, increased noise levels, and visual disturbances on the landscape; and increased potential for collisions with vehicles traveling in the Project Area. Indirect impacts could include habitat fragmentation and reduced habitat values due to prey displacement, spread of invasive species and noxious weeds, and increased deposition of dust on plants.

The degree of these potential impacts would depend on a range of variables including location of nest sites, species relative sensitivity, breeding phenology, and possible topographic shielding. If project development and production activities were to occur during the breeding season for migratory birds (April 1 through July 31 for passerine species or January 1 through August 31 for raptor species), then nest or nesting territory abandonment or loss of eggs or young could occur. Loss of an active nest site, incubating adults, eggs, or young would violate the MBTA.

Two of the proposed well pad locations and three of the proposed well pad expansions and associated pipelines construction activities are located in areas that contain active raptor nest locations or seasonal protective buffers for active nest sites. Seasonal protective buffers are currently in place for each known raptor nest location based on species-specific breeding season requirements (BLM 2008a). Proposed development that overlaps seasonal protective buffers for raptors include the following:

- Proposed new well pads 921-29B and 921-29C, and associated components; and the proposed buried liquid and gas pipelines associated with proposed expansion of well pad 921-29G overlap the 0.50-mile seasonal protective buffer for several Golden Eagle nests. In areas that overlap the 0.50-mile seasonal protective buffer, construction and development activities

will be seasonally limited from January 1 through August 31, pending the results of a preconstruction nest occupancy survey (BLM 2008a).

- Proposed expansions of existing well pads 921-G, 921-29I, and 921-29J, including proposed buried liquid and gas pipelines and access roads; and proposed new well pads 921-29B and 921-29C and associated components overlap the 0.25-mile seasonal protective buffer of Great Horned Owl nests. In areas that overlap the 0.25-mile seasonal protective buffer, construction and development activities will be seasonally limited from February 1 through September 31, pending the results of a preconstruction nest occupancy survey (BLM 2008a).

- Proposed new well pads 921-29B and 921-29C and associated proposed access roads and buried liquid and gas pipelines; and the proposed expansion of existing well pad 921-29G and associated buried liquid and gas pipelines overlap the 0.25-mile seasonal protective buffer for Prairie Falcon nests. In areas that overlap the 0.25-mile seasonal protective buffer, construction and development activities will be seasonally limited from April 1 to August 31, pending the results of a preconstruction nest occupancy survey (BLM 2008a).

Refer to Section 2.2.10 (*Applicant Committed Environmental Protection Measures*) for a list of environmental protection measures that would be applied to development locations that overlap seasonal protective buffers. Application of these measures, including limiting surface-disturbance activities within seasonal and spatial protective buffers would reduce the potential for adverse impacts to raptors with identified nests in the Project Area.

Mitigation Measures for Migratory Birds (including raptors)

This EA tiers to and incorporates the COAs and mitigation measures included in Appendix B of the GNB ROD (BLM 2012b). Refer to Section 2.2.10 (*Applicant Committed Environmental Protection Measures*) of this EA for COAs that are specific to well pads and development in the Project Area. No additional mitigation measures were identified for migratory birds during preparation of this EA.

4.1.4.2. Non-USFWS Designated Wildlife

The Proposed Action could result in up to 32.64 acre-feet of water depletion from the Upper Colorado River Drainage System for dust abatement, construction, and drilling operations. Potential impacts to non-USFWS designated fish species would be similar to those described below for Colorado River Fish Species. Refer to Section 4.15.3.2 (4-172) in the GNB Final EIS (BLM 2012a) for additional information on potential impacts to non-USFWS designated fish species.

Mitigation Measures for Non-USFWS Designated Wildlife Species

This EA tiers to and incorporates the COAs and mitigation measures included in Appendix B of the GNB ROD (BLM 2012b). Refer to Section 2.2.10 (*Applicant Committed Environmental Protection Measures*) of this EA for COAs that are specific to well pads and development in the Project Area. No additional mitigation measures were identified for non-USFWS designated wildlife species during preparation of this EA.

4.1.4.3. Wildlife – Threatened, Endangered, Proposed, or Candidate

The Proposed Action would mostly use recycled water from sources identified in Table 2; however, up to 20 percent of the total estimated water use could come from fresh water delivered from the R.N. Industries Frog Pond. As a result, up to 32.64 acre-feet of water depletion from the Upper Colorado River Drainage System for dust abatement, construction, and drilling operations could occur under the Proposed Action. Water depletions could reduce the ability of the Upper Colorado River Basin to create and maintain the physical habitat (areas inhabited or potentially habitable to special status fish for use of spawning, development of fish larvae, feeding, or serving as corridors between these areas) and the biological environment for the Colorado River Endangered Fish Species. Refer to Section 4.15.2.2 (page 4-166) in the GNB Final EIS (BLM 2012a) and the Final Biological Opinion in the GNB ROD (BLM 2012b) for additional information on water depletions and potential impacts to special status fish species. Therefore, the Proposed Action "***may affect, is likely to adversely affect***" the endangered Colorado pikeminnow, humpback chub, bonytail, and razorback sucker, as described in the GNB Final EIS (BLM 2012a). The Proposed Action may also affect individuals of bluehead sucker, roundtail chub, and flannelmouth sucker, but it would not result in a trend toward the listing of the species. The Proposed Action is within the scope of the Programmatic Section 7 consultation that was completed and documented in Final Biological Opinion (Appendix D) of the GNB ROD (BLM 2012b).

Mitigation Measures for Colorado River Fish Species

This EA tiers to and incorporates the COAs and mitigation measures included in Appendix B of the GNB ROD (BLM 2012b). Refer to Section 2.2.10 (*Applicant Committed Environmental Protection Measures*) of this EA for COAs that are specific to well pads and development in the Project Area. No additional mitigation measures were identified for threatened, endangered, candidate, and special status fish and wildlife species during preparation of this EA.

4.1.5. Livestock Grazing and Rangeland Health Standards

4.1.5.1. Livestock Grazing

Under the Proposed Action, an estimated 98.39 acres of surface disturbance would occur in the Sand Wash Allotment. The allotment would continue to be used below authorized levels due to the increase in the amount of disturbance. The increase in disturbance and development activity although slated for ancillary reclamation leads to increases in weeds and general fragmentation of the landscape within the allotment, which continues to hinder the livestock operation. Therefore, both direct (loss of forage, invasive weeds, etc.) and indirect (increase in vehicle traffic, landscape fragmentation, etc.), impacts to the livestock grazing operation on the Sand Wash Allotment would occur under the proposed action.

4.1.5.2. Rangeland Health Standards and Guidelines

Impacts from large amounts of disturbance and fragmentation contribute to factors (weeds, bare ground, shifts in ecological community structure, erosion, etc.) that often lead to areas not meeting rangeland health.

Under the Proposed Action approximately 98.39 acres of surface disturbance would occur. Disturbing an additional 98.39 acres of surface within the allotment would contribute to soil loss, weed invasion and continued fragmentation. Although much of the disturbed landscape is slated for reclamation, those efforts have not proven to be highly successful within the area. Therefore, it is assumed that ecological impacts are continuing to occur which has the potential to directly and indirectly affect rangeland health standards.

Mitigation Measures for Livestock Grazing and Rangeland Health Standards

This EA tiers to and incorporates the COAs and mitigation measures included in Appendix B of the GNB ROD (BLM 2012b). Refer to Section 2.2.10 (*Applicant Committed Environmental Protection Measures*) of this EA for COAs that are specific to well pads and development in the Project Area. No additional mitigation measures were identified for livestock grazing.

4.2. No Action Alternative Environmental Impacts

Under the No Action Alternative, there would be no impacts from the Proposed Action as the proposed development would not be approved. Under the No Action Alternative, currently approved oil and gas development and other activities in the Project Area would continue. Oil and gas development and associated infrastructure in the Project Area has resulted in approximately 59.55 acres of surface disturbance. Refer to Table 2.1, "Proposed Action Development and Surface Disturbance Summary" (p. 8) for additional information on existing development and surface disturbance in the Project Area.

4.2.1. Air Quality and Greenhouse Gas Emissions

Under the No Action Alternative, the Proposed Action would not be approved and no new project-related emissions would occur. Refer to Section 4.1.1 (pages 4-6 through 4-10) in the GNB Final EIS (BLM 2012a) for additional information on potential air quality impacts under the No Action Alternative.

4.2.2. Invasive Plants/Noxious Weeds, Soils, and Vegetation

Previous and ongoing development in the Project Area has resulted in approximately 59.55 acres of surface disturbance (Table 2.1, "Proposed Action Development and Surface Disturbance Summary" (p. 8)) resulting in direct and indirect impacts to invasive plants/noxious weeds, soils, and vegetation similar to those effects described above for the Proposed Action. Under the No Action Alternative, there would be no direct disturbance or indirect effects to soils and vegetation from surface-disturbing activities associated with the Proposed Action. Refer to Section 4.9.1 (pages 4-89 through 4-91) and Section 4.11.1 (pages 4-100 through 4-104) in the GNB Final EIS (BLM 2012a) for more information on soils and vegetation impacts under the No Action Alternative.

4.2.3. Paleontology

Previous and ongoing development in the Project Area has resulted in approximately 59.55 acres of surface disturbance (Table 2.1, "Proposed Action Development and Surface Disturbance Summary" (p. 8)) resulting in direct and indirect impacts to paleontological resources similar to

those effects described for the Proposed Action. Under the No Action Alternative, there would be no direct or indirect disturbance to paleontological resources from surface-disturbing activities associated with the Proposed Action. Refer to Section 4.5.1 (page 4-138) of the GNB Final EIS (BLM 2012a) for more information on impacts to paleontological resources under the No Action Alternative.

4.2.4. Wildlife

4.2.4.1. Migratory Birds (including raptors)

Previous and ongoing development in the Project Area has resulted in approximately 59.55 acres of surface disturbance (Table 2.1, "Proposed Action Development and Surface Disturbance Summary" (p. 8)) resulting in direct and indirect impacts to migratory birds similar to those effects described above for the Proposed Action. Under the No Action Alternative, there would be no direct disturbance to migratory birds or raptor species from surface-disturbing activities associated with the Proposed Action. Refer to Section 4.15.1.1 (pages 4-153 through 4-154) in the GNB Final EIS (BLM 2012a) for more information on impacts to migratory birds and raptor species under the No Action Alternative.

4.2.4.2. Non-USFWS Designated Wildlife

Previous and ongoing development in the Project Area has resulted in approximately 59.55 acres of surface disturbance (Table 2.1, "Proposed Action Development and Surface Disturbance Summary" (p. 8)) resulting in direct and indirect impacts to non-USFWS designated wildlife similar to those effects described above for the Proposed Action. Under the No Action Alternative, there would be no direct disturbance to non-USFWS designated wildlife or their habitat from surface-disturbing activities associated with the Proposed Action. No new water depletions from the Upper Colorado River Drainage System would occur under the No Action Alternative. Refer to Section 4.15.1 (pages 4-150 through 4-152) in the GNB Final EIS (BLM 2012a) for more information on impacts to non-USFWS designated fish and wildlife species under the No Action Alternative.

4.2.4.3. Wildlife – Threatened, Endangered, Proposed, or Candidate

Colorado River Fish Species

Under the No Action Alternative, there would be no direct impacts to threatened, endangered, or candidate fish species in the Colorado River Basin from surface-disturbing activities or water depletions associated with the Proposed Action. Refer to Section 4.15.1.2 (pages 4-158 through 4-160) in the GNB Final EIS (BLM 2012a) for more information on impacts to USFWS designated threatened, endangered, or candidate fish species under the No Action Alternative.

4.2.5. Livestock Grazing and Rangeland Health Standards

4.2.5.1. Livestock Grazing

The Sand Wash Allotment has been impacted through high amounts of development. However, under the No Action alternative there would be no contributions to the existing disturbance and

fragmentation. Past reclamation within the Sand Wash Allotment has been unsuccessful. The large amount of fragmentation and disturbance throughout the Allotment has led to multiple years of moderate to minimal use by the current grazing permittee.

4.2.5.2. Rangeland Health Standards and Guidelines

Under the No Action alternative there would be no additional disturbance from this project to the Sand Wash Allotment Although no additional disturbance would occur under the No Action Alternative, it cannot be determined that there would be no impacts to rangeland standards as disturbance and development within the allotment is high and continues to occur.

Although much of the disturbed landscape is slated for reclamation, those efforts have not proven to be highly successful within the area. Therefore, it is assumed that ecological impacts are continuing to occur which has the potential to directly and indirectly affect rangeland health standards.

This page intentionally
left blank

Chapter 5. Reasonably Foreseeable Development and Cumulative Impacts

This page intentionally
left blank

Cumulative impacts are those impacts that result from the incremental impact of each alternative when added to other past, present, and reasonably foreseeable actions, regardless of which agency or person undertakes such other actions. Each section below identifies the Cumulative Impact Analysis Areas (CIAAs) for individual resources and resource issues and the rationale for the selection of each area.

5.1. Cumulative Impacts

Proposed drilling, surface disturbance, and other activities under the Proposed Action (as described in Chapter 2 of this EA) are within the bounds of the cumulative impact analysis in the GNB Final EIS (BLM 2012a). The GNB Final EIS (BLM 2012a) identified past, present, and reasonably foreseeable development and analyzed cumulative impacts to resources and resource uses from the drilling and development of oil and gas resources in the GNBPA. As a result, the cumulative impact analysis in this chapter tiers to and incorporates by reference the analysis in the GNB Final EIS (BLM 2012a). The analysis in this chapter provides additional site-specific analysis and information, where appropriate, to inform decision-making on this specific development proposal.

5.2. Past, Present, and Reasonably Foreseeable Development

Past, present, and reasonably foreseeable future development in the GNBPA primarily includes oil and gas development as described in the No Action Alternative and in Table 2.1, "Proposed Action Development and Surface Disturbance Summary" (p. 8), but it also includes oil shale; gilsonite; tar sands; sand and gravel; activities associated with recreation, livestock grazing, vegetative treatments, and infrastructure improvements; and other projects. Past, present, and reasonably foreseeable future oil and gas development in the GNBPA has resulted and will continue to result in approximately 26,093 acres of surface disturbance.[1] Refer to Section 5.2 (pages 5-1 through 5-12) in the GNB Final EIS (BLM 2012a) for additional information on past, present, and reasonably foreseeable development.

5.2.1. Air Quality and Greenhouse Gas Emissions

The CIAA for air quality is the Uinta Basin. The potential impact of the Proposed Action to Uinta Basin ozone levels cannot be accurately modeled. In lieu of accurate modeling, the GNB Final EIS Air Quality Technical Support Document (BLM 2012c), which is the most recent regional air model information available for the Uinta Basin, and the GNB Final EIS (BLM 2012a) Section 5.3.1, are incorporated by reference and summarized below. The GNB Final EIS (BLM 2012a) discloses that most of the cumulative emissions in the Uinta Basin are associated with oil and gas exploration and production activities. Consequently, past, present, and reasonably foreseeable wells in the Uinta Basin are a part of the cumulative actions considered in this analysis. Table 5.1, "2006 Uinta Basin Oil and Gas Operations Emissions Summary" (p. 48) summarizes the 2006 Uinta Basin emissions as well as the incremental impact of this project's alternatives. The Proposed Action comprises a small percentage of the Uinta Basin emissions summary.

[1]The surface disturbance acreage includes past, present, and reasonably foreseeable future projects in the GNBPA, including surface disturbance of the selected alternative in the GNB ROD (BLM 2012b), which incorporates disturbance from the Proposed Action in this EA. Refer to tables 5.2-2 and 5.2-3 in the GNB Final EIS (BLM 2012a) for a description of the past, present, and reasonably foreseeable future projects included in the surface disturbance acreage estimates.

Table 5.1. 2006 Uinta Basin Oil and Gas Operations Emissions Summary

County	NO_X (tpy)	CO (tpy)	SO_X (tpy)	PM (tpy)	VOC (tpy)
Uintah	6,096	4,133	247	344	45,646
Carbon	995	814	22	40	2,747
Duchesne	3,053	2,448	96	173	19,019
Grand	337	207	16	22	2,360
Emery	273	199	9	14	453
Uinta Basin Total	**10,754**	**7,800**	**391**	**592**	**70,226**
Proposed Action	121.37	72.76	6.28	15.65 - $PM_{2.5}$ 45.27 - PM_{10}	186.70
No Action	0	0	0	0	0

Source: GNB Final EIS 2012, Table 5.3-1 (BLM 2012a).

CO Carbon monoxide
PM Particulate Matter
SO_X Oxides of Sulfur
tpy Tons Per Year
VOC Volatile Organic Compound

The GNB model predicted the following impacts to air quality and air quality related values for the GNB Proposed Action, which encompassed 3,675 new wells:

- Cumulative impacts from criteria pollutants to ambient air quality are well below the NAAQS at Class I airsheds and selected Class II areas;
- The incremental impacts to visibility would be virtually impossible to discern and would not contribute to regional haze at the Class I areas;
- The 2018 projected baseline emissions would result in impacts of 1.0 deciview for at least 201 days per year at the Class II areas;
- Discernible impacts at Flaming Gorge National Recreation Area and Dinosaur National Monument were anticipated;
- The GNB Final EIS proposed action would contribute less than 1 percent to the acid deposition in Class I areas, and 4.3 percent at the Flaming Gorge Class II area;
- Project-related acid deposition impacts at sensitive lakes were below the USFWS screening threshold; and
- Ozone levels would be below the current ozone standard of 75 parts per billion (ppb) for the fourth highest annual level in the Uinta Basin for the 2018 projected baseline, and the Proposed Action would be approximately 3.2 percent of the cumulative ozone impact within the Uinta Basin.

Based on the GNB model results, it is anticipated that the impact to ambient air quality and air quality related values associated with the Proposed Action would be indistinguishable from, and dwarfed by, the margin of uncertainty associated with the model and Uinta Basin emission inventory. The No Action Alternative would not result in an accumulation of impacts.

Greenhouse Gases

Inconsistent results based on scientific models used to predict global climate change prohibit the BLM from quantifying cumulative impacts. Drilling and development activities from the Proposed Action are anticipated to release a negligible amount of greenhouse gases into the local airshed, resulting in a negligible cumulative impact. The No Action Alternative would not result in an accumulation of impacts.

5.2.2. Invasive Plants/Noxious Weeds, Soils, and Vegetation

The CIAA for soils, vegetation, and invasive plants/noxious weeds is the GNBPA. Cumulative impacts are primarily attributable to oil and gas development and vegetation management by various federal agencies. Past, present, and reasonably foreseeable future actions would cumulatively and incrementally affect erosion and sedimentation rates within this area, current land uses, revegetation and reclamation success, soil productivity, and the potential introduction and/or spread of noxious weeds and invasive species. Surface-disturbing activity that removes native vegetation and topsoil from the CIAA may cumulatively and incrementally affect general vegetation by fragmenting plant communities and increasing competition with invasive and noxious weeds. Surface-disturbing activities that compact soil, increase erosion and sediment yield, and increase fugitive dust may also cumulatively and incrementally affect general vegetation, as such changes to the landscape may decrease plant productivity and composition in the CIAA.

The past, present, and reasonably foreseeable future total area of disturbance due to oil and gas activity in the CIAA is estimated at 26,093 acres (BLM 2012a), which includes the estimated disturbance from the selected alternative in the GNB ROD (BLM 2012b). The Proposed Action would contribute 98.39 acres to the incremental increase in surface disturbance included in the GNB ROD (BLM 2012b).

Surface disturbance would reduce soil productivity, disturb vegetation communities, and accelerate erosion for the lifetime of oil and gas production until such time that final reclamation is deemed successful in terms of soil stability and soil productivity as measured by amounts and types of vegetative cover and forage. Each acre of disturbance also destroys native vegetation and vegetative cover and introduces or spreads undesired plant species, which may reduce species biodiversity. Noxious weeds and invasive species already exist throughout the CIAA. In general, soils in the Uinta Basin are very thin, slow to develop, and difficult to reclaim because of the arid climate and lack of organic material. Refer to Section 5.3.9 (pages 5-25 through 5-26) of the GNB Final EIS (BLM 2012a) for additional information on cumulative impacts to soils. Refer to Section 5.3.11 (page 5-26 through 5-29) of the GNB Final EIS (BLM 2012a) for additional information on cumulative impacts to vegetation, including weeds. The No Action Alternative would not result in an accumulation of impacts.

5.2.3. Paleontology

The CIAA for paleontology resources is the GNBPA. Cumulative impacts on paleontology resources would result from surface-disturbing activities to fossiliferous rock from either development or poaching activities (BLM 2012a). The past, present, and reasonably foreseeable future total area of disturbance due to oil and gas activity in the CISA is estimated at 26,093 acres (BLM 2012a), which includes the estimated disturbance from the selected alternative in the GNB

ROD (BLM 2012a). The Proposed Action would contribute 98.39 acres to the incremental increase in surface disturbance included in the GNB ROD. Destruction of scientifically important fossils would irreversibly and irretrievably damage the paleontological information base, and those destroyed fossils would not be available for future analysis (BLM 2012a). Preconstruction surveys and other required mitigation measures required by the BLM would result in recovery of important fossils and reduce potential accumulation of cumulative impacts. Refer to Section 5.3.5 (page 5-16) of the GNB Final EIS (BLM 2012a) for additional information on cumulative impacts to paleontology resources. The No Action Alternative would not result in an accumulation of effects.

5.2.4. Wildlife

5.2.4.1. Migratory Birds (including raptors)

The CIAA for migratory birds, including raptors, is the GNBPA. Surface disturbance associated with past, present, and reasonably foreseeable actions, including ongoing and planned oil and gas activities, would cumulatively reduce the amount of available cover, foraging opportunities, habitat productivity, and breeding/nesting areas for migratory birds until successful final reclamation. Human activities would result in short-term or long-term site avoidance, or would preclude migratory birds from using areas of more intensive human activity. In general, the severity of the cumulative effects would depend on factors such as the sensitivity of the species affected, seasonal intensity of use, type of project activity, and physical parameters (e.g., topography, forage, and cover availability). The past, present, and reasonably foreseeable future total area of disturbance due to oil and gas activity in the GNBPA is estimated at 26,093 acres (BLM 2012a), which includes the estimated disturbance from the selected alternative in the GNB ROD (BLM 2012b). The Proposed Action would contribute 98.39 acres to the incremental increase in surface disturbance included in the GNB ROD (BLM 2012b). The No Action Alternative would not result in an accumulation of impacts.

5.2.4.2. Non-USFWS Designated Fish and Wildlife Species

The CIAA for non-USFWS designated species is the GNBPA. Cumulative impacts associated with surface-disturbing activities, including ongoing and planned oil and gas activities, in combination with the Proposed Action would cumulatively contribute to habitat fragmentation, habitat loss, loss of foraging opportunities, and animal displacement until successful final reclamation. Impacts to non-USFWS designated wildlife would be relative to the amount of cumulative habitat loss and disturbance from incremental development, especially in sensitive habitat (e.g., year-long crucial and fawning habitat) (BLM 2012a). The past, present, and reasonably foreseeable future total area of disturbance due to oil and gas activity in the GNBPA is estimated at 26,093 acres (BLM 20l2a), which includes the estimated disturbance from the selected alternative in the GNB ROD (BLM 2012b). The Proposed Action would contribute 98.39 acres to the incremental increase in surface disturbance included in the GNB ROD (BLM 2012b). Refer to Section 5.3.15.1 (page 5-34 through 5-42) in the GNB Final EIS (BLM 20l2a) for more information on cumulative impacts to non-USFWS designated wildlife and their habitat. Potential cumulative impacts to non-USFWS designated fish species would be similar to those described below for Colorado River Fish Species. The No Action Alternative would not result in an accumulation of impacts.

5.2.4.3. Wildlife – Threatened, Endangered, Proposed, or Candidate

Colorado River Fish Species

The CIAA for potential impacts to Colorado River Fish Species is the BLM Vernal Field Office management area. Cumulative effects to fisheries resources would primarily be associated with increased potential for erosion and sedimentation in the Colorado River Basin, and water depletions associated with existing and continued oil and gas developments. Erosion and sedimentation increases in the CIAA waterways would affect fish spawning, fish rearing, and feeding behaviors (BLM 2012a). Water depletions associated with the Proposed Action, in combination with depletions from other activities in the CIAA, would reduce the ability of the Upper Colorado River Basin to create and maintain the physical habitat (areas inhabited or potentially habitable to special status fish for use of spawning, development of fish larvae, feeding, or serving as corridors between these areas) and the biological environment for the Colorado River Endangered Fish Species. In addition, the Colorado River Endangered Fish Species would also be directly affected by project activities if fish become impinged on intakes for water pumping systems.

The Proposed Action could add 32.64 acre-feet of water depletions to water depletions from other past, present, and reasonably foreseeable future projects, and would reduce the volume of flow in the Colorado River Basin. As a result, implementation of the Proposed Action or alternatives, in combination with other activities in the CIAA, would degrade USFWS-designated critical habitat for the Colorado River Endangered Fish Species in the Colorado River Basin. Refer to Section 5.3.15.2 (page 5-42) and Section 5.3.13 (page 5-30) in the GNB Final EIS (BLM 2012a) for more information on cumulative impacts to fisheries and surface water resources. The No Action Alternative would not result in an accumulation of impacts.

5.2.5. Livestock Grazing and Rangeland Health Standards

The CIAA for livestock grazing and Rangeland Health Standards is the Sand Wash Allotment. The allotment includes approximately 74,322 acres, (52,037 acres of BLM, 22,230 acres of SITLA, and 55 acres of private land). Within the CIAA, competition for grazing resources currently exists as a result of disturbance from oil and gas energy development, and trespass cattle and horses from neighboring tribal lands. Reclamation techniques have generally been unsuccessful. Invasive species such as halogeton, tumble weed, tumble mustard and cheatgrass usually dominate disturbed sites throughout the CIAA. The current landscape within the CIAA is heavily fragmented by multiple miles of surface pipelines, roads, well pads (abandoned and active), compressor stations, and other infrastructure typically associated with the oil and gas industry. Table 5.2, “Estimated Cumulative Impacts in the Sand Wash Allotment” (p. 52) depicts known disturbance as well as forseeable oil and gas well locations. Cumulative disturbance for the CIAA is approximately 11,333 acres and 201 miles of ancillary roads which if assumed to be an average of 30 feet wide equates to an additional 745 acres. Therefore, it is currently estimated that more than 16.3 percent of the surface has been or will be disturbed through past, present and ongoing activities. The Proposed Action will contribute 98.39 acres to the overall cumulative disturbance, effectively 0.4percent of the cumulative amount of disturbance.

Cumulatively, the amount of surface disturbance impacts the livestock grazing potential of the allotment and has or will result in direct impacts to the operation through future reductions in AUMs as a direct result of forage loss and fragmentation. Surface impacts also directly (alter

water flow) and indirectly (noise and traffic offset animals loafing and watering at ponds) affect the water improvements specifically managed for livestock grazing. The analysis for any changes in AUM allocation and general grazing operations throughout this allotment will occur in a separate NEPA document specifically for the renewal of the existing grazing permit.

Table 5.2. Estimated Cumulative Impacts in the Sand Wash Allotment

Type of Disturbance	Count	~ Acreage	Other Metrics	Notes
Energy Exploration				
Approved Permit to Drill Locations	265	1,325		DOGM Data
Drilling Locations	12	60		DOGM Data
Locations Abandon	344	1,720		DOGM Data
Operations Center	2	10		DOGM Data
Producing Wells	639	3,195		DOGM Data
Plugged and Abandoned Locations	154	770		DOGM Data
Shut In Well Locations	97	485		DOGM Data
Temporarily Abandoned	10	50		DOGM Data
Reasonably Forseeable Disturbance estimated from 46% of the GNB disturbance is within the SW Allotment	3,000 wells total ~ 1400 to 1500 in SW	3,718	~429 (table 4.6.5 and 4.6.1) AUMs lost in SW as per the GNB EIS	Estimated from Field Development Greater Natural Buttes EIS
***Other:** Surface analysis of lost acreage and lost AUMs is slated to occur for the next 3-4 FYs for the dominant Oil and Gas field allotments in the VFO; beginning with Sand Wash, Seven Sisters, Wild Horse Bench, and Coyote Wash.*				
Other (County, Livestock, Etc.)				
Ponds and/or Guzzlers	~30	60		
Ancillary Roads		~745	183 miles	Assumption for acreage is based on an average width of 30 feet/mile of roads
Total Estimated Cumulative		**11,333 acres**	**201.3 miles**	
**Analysis of the Cumulative and Forseeable Impacts for rangeland resources was based on existing digital GIS data available as of November 01, 2014.*				

Chapter 6. Persons, Groups, and Agencies Consulted

This page intentionally
left blank

6.1. Agency and Tribal Consultation

US Fish and Wildlife Service: The BLM conducted programmatic consultation with the USFWS under Section 7 of the ESA as part of the GNB EIS process. BLM initiated formal consultation on September 16, 2011, by submitting the Biological Assessment to the USFWS. The USFWS concluded consultation by signing a Biological Opinion on January 27, 2012. This project falls within the scope of the programmatic consultation; therefore, consultation is considered complete. For documentation of this process and additional information, refer to the Final Biological Opinion (Appendix D) of the GNB ROD (BLM 2012b).

Utah State Historic Preservation Officer: The BLM conducted consultation with the Utah State Historic Preservation Officer (SHPO) under Section 106 of the National Historic Preservation Action as part of the GNB EIS process. Class III block surveys have been completed for the Project Area and the results of the surveys were sent to the Utah SHPO in March of 2011. Concurrences were included in Appendix E of the GNB ROD (BLM 2012b).

Tribal Consultation: The BLM initiated Government-to-Government consultation with 12 potentially affected and interested Native American Tribes as part of the GNB EIS process on January 9, 2008. As a result of the consultation request, the Navajo Nation requested notification of any unanticipated discoveries unearthed during the course of the project and the Pueblo of Laguna requested notification in the event any new archaeological sites are discovered and artifacts are recovered. No new sites or unanticipated discoveries have been found associated with the Proposed Action. The Hopi Tribe expressed concern with stone cairn sites previously documented in the GNBPA. At the request of the Hopi, the BLM and Director of the Hopi Office of Cultural Preservation visited several of the stone cairn sites in the GNBPA. In August 2009, the BLM prepared a report summarizing the site visit results. No written responses were received from the Hopi. The BLM met with the Hopi in April of 2011 to follow up on the expressed concerns. No further concerns were expressed. For documentation of this process and additional information refer to Appendix E of the GNB ROD (BLM 2012b).

6.2. Summary of Public Participation

On September 18, 2014, the BLM posted notification of this EA on the BLM's Land Use Planning and NEPA register (e-planning) website at: https://www.blm.gov/epl-front-office/eplanning/nepa/nepa_register.do. To date, the BLM has not received any public comments or input.

6.3. List of Preparers

Table 6.1. List of Preparers

Name	Title	Responsible for the Following Section(s) of this Document
BLM Preparers		
Tyler Cox	Natural Resource Specialist	Project manager and quality control
BLM Interdisciplinary Team	-	Refer to Appendix A for the BLM Interdisciplinary Team Checklist that identifies BLM roles.
NEPA Contractor – ICF International		
Alan Rabinoff	Project Director	Senior level review

Name	Title	Responsible for the Following Section(s) of this Document
John Priecko	Project Manager	Chapters 1, 2 Chapters 3, 4, 5, and 6
Alex Bartlett	Project Specialist	Chapters 1, 2 Chapters 3,4, and 5: Air Quality and Greenhouse Gas Emissions; Invasive Plants/Noxious Weeds, Soils, and Vegetation; Chapter 6
Lissa Johnson	Geographic Information Systems Lead	All maps and GIS calculations
Merin Swenson	Project Specialist	Chapters 3 and 4: Paleontology; Fish and Wildlife; Threatened, Endangered, and Candidate Plant Species; Threatened, Endangered, and Candidate Plant Species; Migratory Birds Specialist Level Review of Draft EA and QA/QC
Sean Brewer	Project Specialist	QA/QC and ePlanning
Jenna Wheaton	Project Specialist	ePlanning

Chapter 7. References Cited

This page intentionally
left blank

7.1. References

Bestgen, K.R., K.A. Zelasko, and C.T. Wilcox. 2007. Non-native Fish Removal in the Green River, Lodore and Whirlpool Canyons, 2002-2006, and Fish Community Response to Altered Flow and Temperature Regimes, and Non-native Fish.

British Meteorological Office (BMO). 2009. British Meteorological Office's Hadley Centre, 2009. Available online at http://www.metoffice.gov.uk/climatechange/science/monitoring/

Bureau of Land Management (BLM). 2014. BLM Vernal Field Office Electronic Communication from Tyler Cox. February 2014.

_____. 2013. BLM Vernal Field Office NEPA Documents. Accessed April 2013. Available online: http://www.blm.gov/ut/st/en/fo/vernal/planning/nepa_.html.

_____. 2012a. Greater Natural Buttes Final Environmental Impact Statement, Vol. I, Chapters 1-9. BLM-UT-080-07-807. Vernal Field Office, Vernal Utah. March 2012.

_____. 2012b. Greater Natural Buttes Record of Decision. BLM-UT-080-07-807. Vernal Field Office, Vernal Utah. March 2012.

_____. 2012c. Greater Natural Buttes Final Environmental Impact Statement. Appendix G, Air Quality Technical Support Document. BLM-UT-080-07-807. Vernal Field Office, Vernal Utah. March 2012.

_____. 2012d. BLM Onsite Inspection and Interdisciplinary Resource Reports. Vernal Field Office, Vernal Utah.

_____. 2011. Green River District Reclamation Guidelines for Reclamation Plans. Instruction Memorandum No. IM UTG000-2011-003 Green River District Reclamation Guidelines, March 2011. BLM Green River District.

_____. 2010. Memorandum of Understanding between BLM and US Fish and Wildlife Service to Promote the Conservation of Migratory Birds. BLM MOU WO-230-2010-04. 14p.

_____. 2009. Vernal Field Office Surface Disturbing Weed Policy. Instruction Memorandum No. UTG010-2010-001. Green River District, Vernal, Utah.

_____. 2008a. Record of Decision and Approved Resource Management Plan. BLM-UT-PL-09-003-1610. Vernal Field Office, Vernal, Utah. October 2008.

_____. 2008b. Proposed Resource Management Plan and Final Environmental Impact Statement. Vernal Field Office, Vernal, Utah. August 2008.

_____. 2007. Hydraulic considerations for pipelines crossing stream channels. Technical Note 423. BLM/ST/ST-07/007+2880. Bureau of Land Management, National Science and Technology Center, Denver, CO. 20 pp. Available online: http://www.blm.gov/nstc/ library/techno2.htm.

_____. 1997. Standards for Rangeland Health and Guidelines for Grazing Management for BLM in Utah (BLM-UT-GI-97-001-4000). BLM, Utah State Office.

_____. 1986. Visual Resource Inventory Manual for BLM (H-8410-1). Available Online: http://www.blm.gov/wo/st/en/prog/Recreation/recreation_national/RMS/2.html.

Grasslands Consulting Inc. 2014. Special Status Plant Species Report for NBU 921-29 & 30 Developments

Irving, D.B. and T. Modde. 1994. Assessment of Colorado Squawfish in the White River, Colorado and Utah, 1992-1994. Final Report. Recovery Implementation Program for the Endangered Fishes of the Upper Colorado River Basin. 79 pp.

Kerr-McGee Oil & Gas Onshore L.P., (KMG). 2014. Standard Operating Practice Agreement for the Greater Natural Buttes Field.

Monroe, L. 2007. Native Fish Biologist, Utah Division of Wildlife Resources. Email correspondence with M.Brekke, AECOM, dated November 8, 2007. Expansion. Final Report. Colorado River Recovery Implementation Program Project Number 115, Larval Fish Laboratory Contribution 149. 97 pp.

Montgomery Archaeological Consultants, Inc. (MOAC). 2014. Class I Literature Review of Kerr-McGee Oil and Gas Onshore LPs 115 Proposed NBU Well Locations (T9S, R21E, Sections 29 and 30).

Parrish, J.R., F.P. Howe, R.E. Norvell. 2002. Utah Partners in Flight Avian Conservation Strategy Version 2.0. Utah Partners in Flight Program, Utah Division of Wildlife Resources, 1594 West North Temple, Salt Lake City, UT 84116, UDWR Publication Number 02-27. i–xiv + 302 pp.

SWCA Environmental Consultants. 2014. Paleontological Technical Report for the NBU 921-29 and 30 Section Well Pads, Pipelines, and Access Roads Survey, Uintah County, Utah.

Torrell, R., J.A. Young, and B. Kvasnicka. 2000. Halogeton Poisoning. University of Nevada, Cooperative Extension Fact Sheet-00-20. Reno, Nevada.

Uintah County. 2011. Uintah County General Plan. Available online: http://co.uintah.ut.us/.

USDI and U.S. Department of Agriculture. 2007. Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development. BLM/WO/ST-06/021+3071/REV 07. Bureau of Land Management. Denver, Colorado. 84 pp.

U.S. Environmental Protection Agency (EPA) Air Quality System Data Archives Website. 2010, Utah Department of Air Quality (UDAQ) 2010.

U.S. Global Change Research Program (USGCRP). 2009. Global Climate Change Impacts in the United States. Cambridge University Press.

Utah Administrative Code. 2007. Rule R317-2, Standards of Quality for Waters of the State, as in effect November 1, 2007.

Appendix A. Interdisciplinary Team Checklist

Project Title: Kerr-McGee Oil & Gas Onshore, LP Proposal to Directionally Drill 115 Natural Gas Wells from 8 New Well pads and 14 Existing Well Pads in the Natural Buttes Unit, Uintah County, Utah

NEPA Log Number: DOI-BLM-UT-G010-2014–0262–EA

File/Serial Number: UTU-63047A

Project Leader: Tyler Cox

DETERMINATION OF STAFF: (Choose one of the following abbreviated options for the left column)

NP = not present in the area impacted by the proposed or alternative actions

NI = present, but not affected to a degree that detailed analysis is required

PI = present with potential for relevant impact that need to be analyzed in detail in the EA

NC = (DNAs only) actions and impacts not changed from those disclosed in the existing NEPA documents cited in Section D of the DNA form. The Rationale column may include NI and NP discussions.

Table A.1. Interdisciplinary Team Checklist

Determination	Resource/Issue	Rationale for Determination	Signature	Date
RESOURCES AND ISSUES CONSIDERED (INCLUDES SUPPLEMENTAL AUTHORITIES APPENDIX 1 H-1790-1)				
PI	Air Quality & Greenhouse Gas Emissions	Emissions from earth-moving equipment, vehicle traffic, drilling and completion activities, daily tailpipe and fugitive dust emissions, and other sources could adversely affect air quality and contribute to Greenhouse Gas Emissions (GHGs).	Tyler Cox	9/10/ 2014
NP	BLM Natural Areas	None present as per 2008 Vernal RMP and ROD/GIS layer review.	Tyler Cox	9/10/ 2014
NI	Cultural: Archaeological Resources	The entire project area has been covered by Class III intensive cultural resource inventories. The Class I cultural resource records review identified three previously recorded archaeological sites within the project area. Two of the sites were evaluated as eligible for inclusion into National Register of Historic Places (NRHP) and were both determined to be outside of the proposed undertakings (MOAC 2014). Based on the results of the cultural resource inventories, the BLM has made a determination of no historic properties affected (36CFR800.4(d)(1)) for the proposed undertaking.	Cameron Cox	9/12/ 2014
NI	Cultural: Native American Religious Concerns	Tribal consultations for this area were initiated and closed under the GNB Final EIS (BLM 2012a) and ROD (BLM 2012b). Please refer to Appendix E of the GNB ROD for documentation of the Tribal consultation process. The proposed action would not hinder access to or use of Native American religious sites.	Cameron Cox	9/12/ 2014
NP	Designated Areas: Areas of Critical Environmental Concern	None present as per 2008 Vernal RMP and ROD/GIS layer review.	Tyler Cox	9/10/ 2014
NP	Designated Areas: Wild and Scenic Rivers	None Present as per 2008 Vernal RMP/ROD and GIS layer review	Tyler Cox	10/2/ 2014
NP	Designated Areas: Wilderness Study Areas	None present as per 2008 Vernal RMP/ROD and GIS layer review	Tyler Cox	10/2/ 2014
NP	Environmental Justice	No minority or economically disadvantaged communities or populations would be disproportionately adversely affected by the Proposed Action or alternatives, because none are present in or adjacent to the project area.	Tyler Cox	9/10/ 2014
NP	Farmlands (prime/unique)	Prime or unique farmlands are not present in the Project Area, as designated by the NRCS.	Tyler Cox	9/10/ 2014

DOI-BLM-UT-G010-2014-0262-EA

Determination	Resource/Issue	Rationale for Determination	Signature	Date
RESOURCES AND ISSUES CONSIDERED (INCLUDES SUPPLEMENTAL AUTHORITIES APPENDIX 1 H-1790-1)				
NP	Fuels/Fire Management	No fire or fuel management activities are planned for the Project Area. The proposed project would not conflict with fire management activities due to the use of existing and proposed well pad operations.	Tyler Cox	9/10/ 2014
NI	Geology/Minerals/Energy Production	Known gilsonite veins trend through the area. If gilsonite is encountered during construction, the operator would report that information to BLM VFO. The depth and thickness of the vein is important information that should be provided to BLM. If any blasting is needed during construction activities, the operator must notify any active Gilsonite operation within 2 miles of the location 48 hours prior to any blasting. Natural gas, oil, gilsonite, oil shale and tar sand are the only mineral resources that could be impacted by the project. Production of natural gas or oil would deplete reserves, but the proposed project allows for the recovery of natural gas and oil per 43 CFR 3162.1(a), under the existing Federal lease. Compliance with "Onshore Oil and Gas Order No. 2, Drilling Operations" would assure that the project would not adversely affect Gilsonite, oil shale, or tar sand deposits. Due to the state-of-the-art drilling and wells completion techniques, the possibility of adverse degradation of tar sand or oil shale deposits by the Proposed Action would be negligible. Well completion must be accomplished in compliance with "Onshore Oil and Gas Order No. 2, Drilling Operations." These guidelines specify the following: … proposed casing and cementing programs shall be conducted as approved to protect and/or isolate all usable water zones, potentially productive zones, lost circulation zones, abnormally pressured zones, and any prospectively valuable deposits of minerals. Any isolating medium other than cement shall receive approval prior to use.	Betty Gamber	10/3/ 2014

Determination	Resource/Issue	Rationale for Determination	Signature	Date
RESOURCES AND ISSUES CONSIDERED (INCLUDES SUPPLEMENTAL AUTHORITIES APPENDIX 1 H-1790-1)				
PI	Invasive Plants/Noxious Weeds, Soils & Vegetation	Under the Proposed Action, development of 115 wells on 8 new well pads, the expansion of 14 existing well pads, and the construction of access roads, gas pipelines and liquid pipelines would result in approximately 98.39 acres of surface disturbance until reclamation is successful. For all surface disturbance, the operator would recontour and reseed the soil after abandonment and during reclamation. KMG would control invasive species along roads, pipeline corridors, and on well pads as required in the Conditions of Approval (COAs) of the GNB ROD (BLM 2012b). Based on KMG's commitment to monitor and control noxious weeds, directional drilling from the existing and expanded well pads and proposed project activities should not increase weed infestations within the Project Area, but an increase in infestations of invasive plants/ noxious weeds is possible, even with mitigation measures in place.	Tyler Cox	9/10/ 2014
NI	Lands/Access	The Project Area is located within the Vernal Field Office Resource Management Plan Planning Area which allows for oil and gas development with associated road and pipeline right-of-ways. No existing land uses would be changed or modified by the implementation of the Proposed Action; therefore there would be no adverse effects. Per GIS review there are no Public Water Reserves in the project area	Tyler Cox	9/10/ 2014
NP	Lands with Wilderness Characteristics (LWC)	None Present as per 2008 Vernal RMP/ROD and GIS layer review.	Tyler Cox	10/2/ 2014
PI	Livestock Grazing & Rangeland Health Standards	The proposed project would be located in the Sand Wash Cattle Grazing Allotment. The grazing period for the Sand Wash allotment is from November 30through April 30. The allotment is under NEPA review to change class of livestock from cattle to sheep. The project is in an area that is heavily bisected by oil and gas roads, above ground pipelines and oil pads. Further, the Sand Wash Allotment is heavily fragmented. The 2008 Vernal RMP and ROD indicates that the management category for the Sand Wash Allotment is "M" (Maintain Existing Resource Condition). The proposed project may affect livestock movement patterns, access to water and may affect the allotment with the loss of AUMs due to a cumulative loss of surface vegetation on the Northern end of the allotment. The Northern half of the Allotment is the most utilized by both cattle and leased sheep. In addition, the Proposed Action may impact Rangeland Health Standards	Dusty Carpenter	11/11/1 4

Determination	Resource/Issue	Rationale for Determination	Signature	Date
RESOURCES AND ISSUES CONSIDERED (INCLUDES SUPPLEMENTAL AUTHORITIES APPENDIX 1 H-1790-1)				
		in section 30 due to the fact that a long term range land health site is located near the proposed wells. KMG would apply the COAs from the GNB ROD (BLM 2012b) to limit potential impacts to range resources and livestock operations. Directional drilling and completion activities from the existing and expanded well pad locations would result in temporary increases in industrial traffic and would have impact on grazing activities or livestock operations.		
PI	Paleontology	A paleontological assessment and survey was conducted for the Project Area in August 2014 (SWCA Aug. 7, 2014). Scientifically important fossils and locations of high fossil potential were found in Section 921-29 and 30. Scientifically important fossils were found on the surface at well pads 921–29F, –29G, –29I, –29J, –29K, -29L, –29O; and at well pads 921-30I, –30K, –30L, –30O, and –30P during the survey. Paleontology monitoring will be required at these sites during any ground disturbing activities. Although no several scientifically important fossils were found at the surface during the survey at well pads 921-29B, –29C, –29E, and at well pad 921-30M, there is a high likelihood that subsurface fossils will be unearthed during construction. Paleontology monitoring will be required at these sites during any ground disturbing activities. No scientifically important fossils and locations of high fossil potential were found at well pad 921-29N; and at well pads 921-30A, –30D, –30F, –30G and –30N during the surveys.	Betty Gamber	10/3/ 2014
NI	Plants: BLM Sensitive	The following UT BLM Sensitive plant species are present or expected in the same or an adjacent subwatershed as the proposed project: Yucca sterilis and Cryptantha grahamii. ● Sandy soils in the vicinity of the proposed project may provide suitable habitat for Yucca sterilis. However, no populations are present in the Project Area and none were documented during the 2014 surveys of the Project Area. Given the exclusively clonal nature of the species, the potential for future establishment is negligible. ● Suitable habitat for Graham's catseye (Cryptantha grahamii) is on Green River shales in mixed desert shrub, sagebrush or mountain shrub vegetation elevations from 5,000 -7,400 feet. This habitat	Christine Cimiluca	9/19/ 2014

Determination	Resource/Issue	Rationale for Determination	Signature	Date
RESOURCES AND ISSUES CONSIDERED (INCLUDES SUPPLEMENTAL AUTHORITIES APPENDIX 1 H-1790-1)				
		(Green River shale) is not present in the Project Area, and no populations or individuals have been documented in the Project Area per BLM GIS review.		
NP	Plants: Threatened, Endangered, Proposed, or Candidate	The following threatened, endangered, proposed, or candidate plant species are expected within the same or an adjacent subwatershed: Uinta Basin hookless cactus (Sclerocactus wetlandicus). ● The proposed project is located within U.S. Fish and Wildlife 2013 potential habitat polygon for Uinta Basin hookless cactus. ● No historical records occur within the Project Area and no occurrence of this species was observed during the spot-check survey conducted from July 8-14, 2014 (Grasslands Consulting 2013). Since there were no occurrences of Uinta Basin hookless cactus observed during project surveys, this species is assumed to be not present.	Christine Cimiluca	9/19/ 2014
NP	Plants: Wetland/Riparian	Inventoried and observed riparian areas are absent in the Project Area. As a result, no impacts to wetlands/riparian zones are anticipated as a result of proposed project activities.	Tyler Cox	9/10/ 2014
NI	Recreation	No developed recreation sites/trails or Special Recreation Management Areas (SRMAs) exist within the Project Area. The Project Area is located in the Vernal Extensive Recreation Management Area (ERMA), which has limited recreational use. Based on the lack of existing developed recreation sites and use, impacts from implementation of proposed activities would be minimal.	Tyler Cox	10/2/ 2014
NI	Socio-Economics	No impact to the social or economic status of the county or nearby communities would occur from this project due to its small size in relation to ongoing development throughout the basin. Cumulative effects on socio-economic conditions resulting from past, present, and future development (including the Proposed Action) are described in the GNB Final EIS (BLM 2012a)	Tyler Cox	9/10/ 2014

Determination	Resource/Issue	Rationale for Determination	Signature	Date
RESOURCES AND ISSUES CONSIDERED (INCLUDES SUPPLEMENTAL AUTHORITIES APPENDIX 1 H-1790-1)				
NI	Visual Resources	All proposed development would be on VRM Class IV and be consistent with management objectives for this VRM Class. The Project Area is managed for VRM Class IV objectives. Class IV objectives state: "The objective for this class is to provide for management activities that require major modifications of the existing character of the landscape. The level of change to the characteristic landscape may be high. These management activities may dominate the view and be the major focus of view attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements (BLM, 1986)." Visual resources relevant to the Project Area can generally be characterized by landscape based high desert look consisting of natural browns and reds, rock outcrops, horizontal and vertical broken lines with sparse, low lying vegetation. Existing structures include abandoned well pads in various states of reclamation, existing drilling structures with associated movement, form, lines, textures, and colors. KMG would adhere to visual resource mitigation measures established in Section 4.12.2.2 of the GNB FEIS and the visual resource Conditions of Approval in the GNB ROD (BLM 2012b) to limit the potential for visual impacts resulting from the Proposed Action.	Tyler Cox	10/2/ 2014
NI	Wastes (hazardous/solid)	Hazardous materials above reportable quantities will not be produced by drilling or completing the proposed wells or constructing the pipelines/facilities. All wastes subject to regulation will be handled in compliance with applicable laws to minimize the potential for leaks or spills to the environment. KMG also maintains a Spill Control and Countermeasure Plan, which includes notification requirements, including the BLM, for all reportable spills of oil, produced liquids, and hazardous materials. Chemicals subject to reporting under Title III of the Superfund Amendments and Reauthorization Act (SARA) in quantities of 10,000 pounds or more may be produced and/or stored at production facilities (crude oil/condensate, produced water). These chemicals may also be kept in limited quantities on drilling sites (barite, diesel fuel, cement,	Tyler Cox	9/10/ 2014

Determination	Resource/Issue	Rationale for Determination	Signature	Date
RESOURCES AND ISSUES CONSIDERED (INCLUDES SUPPLEMENTAL AUTHORITIES APPENDIX 1 H-1790-1)				
		cottonseed hulls, etc.) for short periods of time during drilling or completion activities. Trash and other waste materials would be cleaned up and removed immediately after completion of operations. Produced Water: Where necessary and if conditions (freeboard, etc.) allow, produced liquids from newly completed wells may be temporarily disposed of into pits for a period not to exceed 90 days as per Onshore Order No. 7 (OSO 7). Permanent approved produced water disposal methods will be employed in accordance with OSO 7 and in accordance with the COAs, applicant committed measures, and the Long-term Water Monitoring Plan for the Greater Natural Buttes Project Area from the GNB ROD (BLM 2012b).		
NI	Water: Floodplains	All proposed wells would be drilled from existing and proposed new well pad expansion sites and would avoid HUD inventoried floodplains. None of the proposed well pad expansions, developments, or associated components cross HUD inventoried floodplains and would not be of concern under Executive Order for Flood Plain Management.	Tyler Cox	9/10/ 2014
NI	Water: Groundwater Quality	Ground Water: Compliance with "Onshore Oil and Gas Order No. 1 will assure that the project will not adversely affect groundwater quality. Due to the state-of-the-art drilling and wells completion techniques, the possibility of adverse degradation of groundwater quality or prospectively valuable mineral deposits by the Proposed Action would be negligible.	Betty Gamber	10/3/ 2014
NI	Water: Hydrologic Conditions (stormwater)	The proposed construction of the well pad locations and pipelines would alter the topography of the area to a small degree and change surface water flow patterns until the area is reclaimed. The construction of 8 new well pads and expansion of 14 existing well pads (and associated infrastructure) will have Spill Control and Countermeasure Plans in place, limiting the effects of construction to the landscape. Per the COAs in the GNB ROD (BLM 2012b), KMG will employ industry BMPs to control stormwater runoff, including appropriate measures to prevent disturbed sediments from reaching the White River drainage during precipitation events. It is not expected that surface water or stormwater would be created to the level of concern for Clean Water Act Section 402 (stormwater) review.	Tyler Cox	9/10/ 2014

Determination	Resource/Issue	Rationale for Determination	Signature	Date
RESOURCES AND ISSUES CONSIDERED (INCLUDES SUPPLEMENTAL AUTHORITIES APPENDIX 1 H-1790-1)				
NI	Water: Surface Water Quality	The Proposed Action would result in an estimated 98.39 acres of surface disturbance associated with the construction of 8 new and 14 expanded well pads, associated access roads, and pipelines. The surface disturbance associated with the Proposed Action may have the potential to negatively impact surface water quality. However, COAs and applicant-committed measures and from the GNB ROD (BLM 2012b) associated with surface disturbance, reclamation, and hydrology; and implementation of the Long-term Water Monitoring Plan for the Greater Natural Buttes Project Area would likely reduce the potential for surface water impacts to a negligible level.	Tyler Cox	9/10/ 2014
NI	Water: Waters of the U.S.	The proposed 115 wells would be located on 8 new well pads and 14 existing expanded well pads. All wells would be directionally drilled and associated access roads and pipelines would not cross any identified wetlands or waters of the U.S.	Tyler Cox	9/10/ 2014
NI	Wild Horses	The Project Area is not located in a wild horse Herd Area/Herd Management Area. Therefore, impacts to wild horses are not anticipated as a result of the Proposed Action.	Tyler Cox	9/10/ 2014
PI	Wildlife: Migratory Birds (including raptors)	Migratory birds and raptors are present in the Project Area and could be affected by surface disturbance and temporary displacement due to other project-related activity. Based on review of available GIS data, the following proposed development features are within seasonal protective buffers for identified raptor nests. ● Proposed new well pads 921-29B and 921-29C and associated proposed access roads and buried liquid and gas pipelines; and the proposed buried liquid and gas pipelines associated with the proposed expansion of well pad 921-29G fall within the 0.50 mile buffers of several Golden Eagle nests located in Section 921-20. ● Proposed expansions of existing well pads 921-29G, 921-29I, and 921-29J, including proposed buried liquid and gas pipelines and access roads fall within the 0.25 mile buffers of two Great Horned Owl nests located in Section 921-29 (Anadarko 2014). ● Proposed new well pads 921-29B and 921-29C and associated proposed access roads and buried liquid and gas pipelines; and the proposed expansion of existing well pad 921-29G and associated buried liquid and gas pipelines are within the 0.25 mile buffers of two Prairie Falcon nests located in Section 921-29.	Dan Emmett	10/2/ 2014

Determination	Resource/Issue	Rationale for Determination	Signature	Date
RESOURCES AND ISSUES CONSIDERED (INCLUDES SUPPLEMENTAL AUTHORITIES APPENDIX 1 H-1790-1)				
PI	Wildlife: Non-USFWS Designated	Activities associated with the Proposed Action may have adverse effects on general wildlife species and water depletions could affect fish species in the Colorado River Basin. No fish or wildlife designated areas, including elk and mule deer migration corridors or crucial range, or Lynx linkage zones have been identified relevant to the Project Area.	Dan Emmett	10/2/ 2014
PI	Wildlife: Threatened, Endangered, Proposed or Candidate	There is no designated T&E habitat within project area. The Proposed Action would result in water depletions from the Upper Colorado River Basin and could result in impacts to Colorado River federally-listed fish species. Is the proposed project in sage grouse PPH or PGH? No If the answer is yes, the project must conform with WO IM 2012-043.	Dan Emmett	10/2/ 2014
NP	Woodlands/Forestry	None Present as per Vernal Field Office RMP/ROD and GIS database.	Tyler Cox	9/10/ 2014

Table A.2. Final Review

Reviewer Title	Signature	Date	Comments
Environmental Coordinator	/s/ Jessica Taylor	12/23/2014	
Authorized Officer	/s/ Jerry Kenczka	12/29/2014	

This page intentionally
left blank

Appendix B. Proposed New Wells and Associated Well Pads

Table B.1. Proposed New Wells and Associated Well Pads

Well Pad	Number of Proposed New Wells	Well Names	Acres of Well Pad Expansion	Number of Proposed New Wells on Well Pad Expansions	Number of Proposed New Wells on New Well Pads
NBU 921-29B	7	NBU 921-29A1CS, NBU 921-29A1BS, NBU 921-29A4BS, NBU 921-29A4CS, NBU 921-29B1CS, NBU 921-29B4BS, NBU 921-29B1BS	7.25	-	7
NBU 921-29C	6	NBU 921-29C1BS, NBU 921-29C1CS, NBU 921-29D1BS, NBU 921-29D1CS, NBU 921-29C4BS, NBU 921-29C4CS	5.89	-	6
NBU 921-29E	6	NBU 921-29D4BS, NBU 921-29D4CS, NBU 921-29E1BS, NBU 921-29E4CS, NBU 921-29E4BS, NBU 921-29E1CS	2.71	6	-
NBU 921-29F	5	NBU 921-29K1BS, NBU 921-29F4CS, NBU 921-29F1BS, NBU 921-29F1CS, NBU 921-29F4BS	7.65	-	5
NBU 921-29G	6	NBU 921-29G1CS, NBU 921-29H4BS, NBU 921-29B4CS, NBU 921-29H1CS, NBU 921-29G1BS, NBU 921-29H1BS	3.02	6	-
NBU 921-29I	7	NBU 921-29I4BS, NBU 921-29I1CS, NBU 921-29I1BS, NBU 921-29H4CS, NBU 921-29I4CS, NBU 921-29P1BS, NBU 921-29P1CS	2.84	7	-
NBU 921-29J	4	NBU 921-29J4BS, NBU 921-29J1CS, NBU 921-29J1BS, NBU 921-29G4CS	2.12	4	-
NBU 921-29K	5	NBU 921-29J4CS, NBU 921-29G4BS, NBU 921-29O1BS, NBU 921-29K1CS, NBU 921-29K4CS	3.09	5	-
NBU 921-29L	4	NBU 921-29L1BS, NBU 921-29L1CS, NBU 921-29L4BS, NBU 921-29M1BS	1.65	4	-
NBU 921-29N	4	NBU 921-29N1BS, NBU 921-29N1CS, NBU 921-29M4BS, NBU 921-29N4CS	1.91	4	-
NBU 921-29O	4	NBU 921-29P4BS, NBU 921-29O4CS, NBU 921-29O1CS, NBU 921-29O4BS	2.70	4	-
NBU 921-30A	6	NBU 921-30A1BS, NBU 921-30A1CS, NBU 921-30B1BS, NBU 921-30B1CS, NBU 921-30H1CS, NBU 921-30H1BS	4.32	6	-
NBU 921-30D	6	NBU 921-30C1BS, NBU 921-30D4CS, NBU 921-30E1CS, NBU 921-30D1CS, NBU 921-30D1BS, NBU 921-30E1BS	3.82	6	-
NBU 921-30F	6	NBU 921-30C1CS, NBU 921-30C4CS, NBU 921-30F1BS, NBU 921-30F4CS, NBU 921-30F4BS, NBU 921-30F1CS	2.64	6	-
NBU 921-30G	6	NBU 921-30G1CS, NBU 921-30G4CS, NBU 921-30G1BS, NBU 921-30J1BS, NBU 921-30B4CS, NBU 921-30B4BS	2.38	6	-

Well Pad	Number of Proposed New Wells	Well Names	Acres of Well Pad Expansion	Number of Proposed New Wells on Well Pad Expansions	Number of Proposed New Wells on New Well Pads
NBU 921-30I	6	NBU 921-30I4CS, NBU 921-30H4BS, NBU 921-30H4CS, NBU 921-30I1BS, NBU 921-30I4BS, NBU 921-30I1CS	2.04	6	-
NBU 921-30K	5	NBU 921-30N1BS, NBU 921-30K4BS, NBU 921-30K1BS, NBU 921-30K4BS, NBU 921-30K1CS	3.96	5	-
NBU 921-30L	6	NBU 921-30E4BS, NBU 921-30E4CS, NBU 921-30L1BS, NBU 921-30L1CS, NBU 921-30L4CS, NBU 921-30L4BS	9.55	-	6
NBU 921-30M	3	NBU 921-30M1BS, NBU 921-30M1CS, NBU 921-30M4BS	8.37	-	3
NBU 921-30N	3	NBU 921-30N1CS, NBU 921-30N4CS, NBU 921-30N4BS	5.57	-	3
NBU 921-30O	6	NBU 921-30O1CS, NBU 921-30O4BS, NBU 921-30O1BS, NBU 921-30J4CS, NBU 921-30J4BS, NBU 921-30J1CS	7.97	-	6
NBU 921-30P	4	NBU 921-30P1BS, NBU 921-30P1CS, NBU 921-30P4CS, NBU 921-30P4BS	6.94	-	4

Appendix C. Proposed Action Development and Surface Disturbance

Table C.1. Proposed Action Development and Surface Disturbance in Section 921-29

Feature	NBU 921-29B New Well Pad	NBU 921-29C New Well Pad	NBU 921-29E Well Pad Expansion	NBU 921-29F New Well Pad	NBU 921-29G Well Pad Expansion	NBU 921-29I Well Pad Expansion	NBU 921-29J Well Pad Expansion	NBU 921-29K Well Pad Expansion	NBU 921-29L Well Pad Expansion	NBU 921-29N Well Pad Expansion	NBU 921-29O Well Pad Expansion	Total
Wells and Well Pads												
Number of Proposed New Wells on Well Pad	7	6	6	5	6	7	4	5	4	4	4	**58**
Proposed Well Pad Disturbance (acres)	5.13	4.90	1.59	5.42	1.60	2.04	1.6	1.43	1.49	1.82	2.44	**29.46**
Number of Existing Wells on Well Pads	-	-	1	-	1	1	1	1	1	1	1	**8**
Existing Well Pad Disturbance (acres)	-	-	3.33	-	3.18	3.38	3.22	3.28	3.21	3.22	3.22	**26.05**
Roads												
Proposed New Roads (feet)[1]	789	704	644	746	0	101	0	1,017	0	0	113	**4,114**
Proposed New Road Disturbance (acres)[1]	0.82	0.73	0.67	0.77	0	0.10	0	1.05	0	0	0.12	**4.25**
Existing Roads (feet)	-	-	-	-	-	-	-	-	-	-	-	**20,006[3]**
Existing Roads (acres)	-	-	-	-	-	-	-	-	-	-	-	**8.27[3]**
Buried Gas and Liquids Pipelines												
Proposed New 6, 8, and 10-inch Gas and Liquid Gathering Pipelines (feet)[2]	855	248	147	817	1,042	1,020	117	885	154	89	208	**5,582[4]**
Proposed New 6, 8, and 10-inch Gas and Liquid Gathering Pipeline Disturbance (acres)[2]	0.88	0.26	0.15	0.56	0.72	0.70	0.08	0.61	0.16	0.09	0.14	**4.35**
Proposed New AUM 16-inch Buried Gas Pipeline (feet)[2]	621	-	434	-	1,020	-	30	-	-	-	-	**2,105**
Proposed New AUM 16-inch Buried Gas Pipeline (acres)[2]	0.42	-	0.30	0.90	0.70	-	0.44	-	-	-	-	**2.76**
Surface Disturbance Totals												
Total Acres of New Surface Disturbance under the Proposed Action (acres)	7.25	5.89	2.71	7.65	3.02	2.84	2.12	3.09	1.65	1.91	2.70	**40.83**
Total Existing Disturbance (acres)	-	-	3.33	-	3.18	3.38	3.22	3.28	3.21	3.22	3.22	**34.32[5]**

Feature	NBU 921-29B New Well Pad	NBU 921-29C New Well Pad	NBU 921-29E Well Pad Expansion	NBU 921-29F New Well Pad	NBU 921-29G Well Pad Expansion	NBU 921-29I Well Pad Expansion	NBU 921-29J Well Pad Expansion	NBU 921-29K Well Pad Expansion	NBU 921-29L Well Pad Expansion	NBU 921-29N Well Pad Expansion	NBU 921-29O Well Pad Expansion	Total
Total Disturbance including Existing and Proposed Development (acres)	7.25	5.89	6.04	7.65	6.20	6.22	5.34	6.37	4.86	5.13	5.92	**75.15**
Reclaimable New Surface Disturbance/Interim Reclamation Estimates (acres)[6]												**24.09**

[1]Assumes a 45-foot construction width, and a 12-18-foot running surface.
[2]Assumes a 30-foot construction width adjacent to existing roads and a 45-foot construction width cross-country.
[3]Existing road disturbance totals includes county and non-county roads, including BLM-administered land and state land.
[4]The gas and liquids pipelines associated with each well pad would be buried in the same trench. The length (feet) represents the total combined length of the pipelines.
[5]Includes the total existing disturbance for well pads, roads, and pipelines, shown on Map 1, including BLM-administered and state lands.
[6]The reclamation estimate is based on the estimated reclaimable surface disturbance percentage (41 percent of new disturbance) for the selected alternative in the GNB ROD (BLM 2012b).

Table C.2. Proposed Action Development and Surface Disturbance in Section 921-30

Feature	NBU 921-30A Well Pad Expansion	NBU 921-30D Well Pad Expansion	NBU 921-30F Well Pad Expansion	NBU 921-30G Well Pad Extension	NBU 921-30I Well Pad Expansion	NBU 921-30K Well Pad Expansion	NBU 921-30L New Well Pad	NBU 921-30M New Well Pad	NBU 921-30N New Well Pad	NBU 921-30O New Well Pad	NBU 921-30P New Well Pad	Total
Wells and Well Pads												
Number of Proposed New Wells on Well Pad	6	6	6	6	6	5	6	3	3	6	4	**57**
Proposed Well Pad Disturbance (acres)	2.36	1.96	1.74	1.88	1.41	1.71	4.96	4.92	5.07	5.01	4.85	**35.87**
Number of Existing Wells on Well Pads	1	1	1	1	1	-	-	-	-	-	-	**5**
Existing Well Pad Disturbance (acres)	3.28	3.33	3.33	3.33	3.33	3.28	-	-	-	-	-	**19.88**
Roads												
Proposed New Roads (feet)[1]	20	144	30	59	24	217	3,256	1,978	297	813	1,083	**7,921**
Proposed New Road Disturbance (acres)[1]	0.02	0.15	0.03	0.06	0.02	0.22	3.36	2.04	0.31	0.84	1.12	**8.18**
Existing Roads (feet)	-	-	-	-	-	-	-	-	-	-	-	**12,949[3]**
Existing Roads (acres)	-	-	-	-	-	-	-	-	-	-	-	**5.35[3]**
Buried Gas and Liquids Pipelines												
Proposed New 6, 8 and 10-inch Gas and Liquid Gathering Pipelines (feet)[2]	142	1,876	26	394	62	227	203	2,041	277	358	680	**6,286[4]**
Proposed New 6, 8, and 10-inch Gas and Liquid Gathering Pipeline Disturbance (acres)[2]	0.15	1.71	0.03	0.27	0.04	0.16	0.14	1.41	0.19	0.25	0.47	**4.82**
Proposed New AUM 16-inch Buried Gas Pipeline (feet)[2]	1,995	-	814	243	821	1,436	1,588	-	-	2,723	732	**10,352**
Proposed New AUM 16-inch Buried Gas Pipeline (acres)[2]	1.79	-	0.84	0.17	0.57	0.99	1.09	-	-	1.87	0.5	**7.82**
Surface Disturbance Totals												
Total Acres of New Surface Disturbance under the Proposed Action (acres)	4.32	3.82	2.64	2.38	2.04	3.96	9.55	8.37	5.57	7.97	6.94	**57.56**
Total Existing Disturbance (acres)	3.28	3.33	3.33	3.33	3.33	3.28	-	-	-	-	-	**25.23[5]**

Feature	NBU 921-30A Well Pad Expansion	NBU 921-30D Well Pad Expansion	NBU 921-30F Well Pad Expansion	NBU 921-30G Well Pad Extension	NBU 921-30I Well Pad Expansion	NBU 921-30K Well Pad Expansion	NBU 921-30L New Well Pad	NBU 921-30M New Well Pad	NBU 921-30N New Well Pad	NBU 921-30O New Well Pad	NBU 921-30P New Well Pad	Total
Total Disturbance including Existing and Proposed Development (acres)	7.60	7.15	5.97	5.71	5.37	7.24	9.55	8.37	5.57	7.97	6.94	**82.79**
Reclaimable New Surface Disturbance/Interim Reclamation Estimates (acres)[6]												**33.96**

[1]Assumes a 45-foot construction width, and a 12-18-foot running surface.
[2]Assumes a 30-foot construction width adjacent to existing roads and a 45-foot construction width cross-country.
[3]Existing road disturbance totals includes county and non-county roads, including BLM-administered land and state land.
[4]The gas and liquids pipelines associated with each well pad would be buried in the same trench. The length (feet) represents the total combined length of the pipelines.
[5]Includes the total existing disturbance for well pads, roads, and pipelines, shown on Map 1, including BLM-administered and state lands.
[6]The reclamation estimate is based on the estimated reclaimable surface disturbance percentage (41 percent of new disturbance) for the selected alternative in the GNB ROD (BLM 2012b).