Environmental Assessment
EA
Serial

Burlington Resources Oil and Gas Company, LP Proposed San Juan 30-6 Unit #57M Natural Gas Well and Pipeline Project

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Prepared For:

Bureau of Land Management—Farmington Field Office

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1. INTRODUCTION

Burlington Resources Oil and Gas Company, LP (Burlington) has proposed to directionally drill the San Juan 30-6 Unit #57M natural gas well and construct an associated well-tie pipeline (proposed project) in Rio Arriba County, New Mexico. The legal coordinates for the proposed project are:

Surface Location:
645 feet FNL (from north line), 835 feet FWL (from west line)
Section 30, Township 30 North, Range 06 West
New Mexico Principal Meridian (NMPM)

Bottom Hole Location:
2,165 feet FNL, 710 feet FWL
Section 30, Township 30 North, Range 06 West, NMPM

Pipeline:
NE ¼ NW ¼ of Section 30, Township 30 North, Range 06 West, NMPM

Surface disturbance activities associated with drilling the proposed gas well would entail construction of a well pad and subsurface well-tie pipeline. The proposed project would be located 400-feet south of Francis Creek approximately 0.1 mile south of New Mexico State Highway 527 and 5.7 linear miles northeast of Navajo City, New Mexico. Burlington has filed an Application for Permit to Drill (APD) for the natural gas well with the Bureau of Land Management Farmington Field Office (BLM/FFO). If the well is productive, then the Williams Four Corners, LLC (Williams) would file for a right-of-way (ROW) grant with the BLM/FFO to construct and operate the proposed well-tie pipeline. The proposed natural gas well project would be located on federal land with the federal mineral estate administered by the BLM/FFO.

1.1 Purpose and Need

The purpose of the proposed action is to allow the applicant to produce natural gas or oil from the valid 925 acre federal mineral lease USA SF-080711-A issued by the BLM in 1951 and subsequently acquired by Burlington. It is the policy of the BLM to make mineral resources available for production and to encourage development of mineral resources to meet national, regional, and local needs. The Mineral Leasing Act of 1920, as amended (30 USC [United States Code] 181 et seq.), authorizes the BLM to issue oil and gas leases for the exploration of mineral resources and permit the development of those leases. The existing lease is a binding legal contract that allows development of the mineral by the lease holder. An approved APD, issued by the BLM, would authorize Burlington to construct the well pad and drill the proposed well.

1.2 Conformance with Applicable Land Use Plan and Other Environmental Assessments

Pursuant to Title 40 Code of Federal Regulations (CFR), Sections 1508.28 and 1502.21, this Environmental Assessment (EA) tiers into and incorporates by reference the information and analysis contained in the Farmington Proposed Resource Management Plan/Final Environmental Impact Statement (PRMP/FEIS) (BLM 2003*a*), which was approved for the BLM/FFO by the Record of Decision (ROD) signed September 29, 2003 (BLM 2003*b*). The PRMP/FEIS and ROD are available for review at the BLM/FFO, Farmington, New Mexico, or electronically at http://www.nm.blm.gov/ffo/ffo_home.html. This project EA addresses site-specific resources and/or impacts that are not covered within the PRMP/FEIS, as required by the National Environmental Policy Act of 1969 (NEPA), as amended (Pub. L. 91-90, 42 USC 4321 et seq.). The proposed project would not be in conflict with any local, county, or state plans.

1.3 Federal, State, or Local Permits, Licenses, or Other Consultation Requirements

Under Section 402 of the Clean Water Act (CWA) (as amended), the U.S. Environmental Protection Agency (USEPA) regulates storm water discharges from industrial and construction activities under the National Pollutant Discharge Elimination System program. Additionally, Sections 404 of the Act regulated by the U.S. Army Corps of Engineers and Section 401 of the Act regulated by the New Mexico Environment Department (NMED) or USEPA (depending upon surface ownership), protect wetlands and waters of the United States. Operators are required to obtain all necessary permits and approvals for projects requiring CWA permits prior to any surface disturbing activities.

The New Mexico Energy, Minerals, and Natural Resources Department requires oil and gas operators to follow "pit rule" guidelines contained within the New Mexico Administrative Code (NMAC), Title 19.15.17, to reduce the potential for groundwater contamination from industry related activities.

The Endangered Species Act of 1973 requires all federal departments and agencies to conserve threatened, endangered, and critical and sensitive species and the habitats on which they depend, and to consult with the U.S. Fish and Wildlife Service (USFWS) on all actions authorized, funded, or carried out by the agency to ensure that the action will not likely jeopardize the continued existence of any threatened and endangered species or adversely modify critical habitat.

Compliance with Section 106 of the National Historic Preservation Act, are adhered to by following the BLM – New Mexico State Historic Preservation Office protocol agreement, which is authorized by the National Programmatic Agreement between the BLM, the Advisory Council on Historic Preservation, and the National Conference of State Historic Preservation Officers.

Additionally, Burlington will:

- Comply with all applicable federal, state, and local laws and regulations.

- Obtain the necessary permits for the drilling, completion, and production of the well, including water rights appropriations, the installation of water management facilities, water discharge permits, and relevant air quality permits.
- Certify that a Surface Use Agreement has been reached with the private landowner, where required.

2. ALTERNATIVES INCLUDING THE PROPOSED ACTION

2.1 Alternative A – No Action

The BLM NEPA Handbook (H-1790-1) states that for EAs on externally initiated proposed actions, the No Action Alternative generally means that the proposed activity will not take place. This option is provided in 43 CFR 3162.3-2 (h) (2). This alternative would deny the approval of the APD and the current land and resource uses would continue to occur in the proposed project area. No mitigation measures would be required.

2.2 Alternative B – Proposed Action

Proposed Action Title/Type: San Juan 30-6 Unit #57M natural gas well project/Application for Permit to Drill and Right-of-Way Grant

County: Rio Arriba County, New Mexico

Applicant(s): Burlington and Williams

Surface Owner: BLM

Mineral Estate: Federal

Williams has filed an APD for the proposed San Juan 30-6 Unit #57M natural gas well to access the mineral estate administered by the BLM/FFO. Legal coordinates for the proposed project surface location are 645 feet FNL and 835 feet FWL and the bottom hole location would be 2,165 feet FNL, 710 feet FWL both in Section 30, Township 30 North, Range 06 West, NMPM, Rio Arriba County, New Mexico. The proposed well-tie pipeline would be located in the NE ¼ NW ¼ of Section 30, Township 30 North, Range 08 West, NMPM. A project vicinity map is provided as Figure 1. Figure 2 shows the proposed action on the Navajo Dam, New Mexico U.S. Geological Survey 7.5-minute quadrangle map. Figure 3 shows the proposed action on the Navajo Dam, 2009 New Mexico digital photo orthoquad.

The project area would not be located within any BLM designated Area of Critical Environmental Concerns (ACEC).

Drilling of the proposed San Juan 30-6 Unit #57M natural gas well project would require the construction of a well pad 230-foot by 300-foot with a 50-foot-wide construction zone around the perimeter of the pad. If the proposed natural gas well should prove productive, Williams would construct and operate the proposed well-tie pipeline, which would be approximately 1,165 feet in length within a 40-foot wide ROW for a total disturbance of 0.91 acre. The proposed well-tie pipeline would be located adjacent to an existing road and then within the proposed well pad dimensions.

On the proposed south construction zone, the proposed well pad would be adjacent to and overlapping an existing road. No new access road would be constructed. Total surface disturbance for the proposed project would be 3.94 acres. Approximately 30 percent, or 1.18 acres, of the proposed well pad and well-tie pipeline ROW would be located on previously disturbed terrain. Total new disturbance for the proposed project would be approximately 2.76 acres.

Construction activities associated with the proposed action would include directionally drilling the proposed natural gas well and the installation of any surface and subsurface equipment necessary for natural gas production. Construction of the proposed well pad would commence following the BLM/FFO approval of Burlington APD. In general, construction would follow the sequence listed below.

- Construction crews remove vegetation from the proposed natural gas well project site. Excavated materials from the cuts would be used on the fill portion of the location to level the pad. Included in the pad construction would be excavation of the reserve and blow pits. Cut material from the reserve and burn pits would be stockpiled on the location or used to construct the back walls of the burn pit, which is where the gas is flared (burned) during drilling to relieve wellbore pressure.
- Natural gas well drilling facility assembly would occur on the well pad after site clearing and leveling. Associated facilities and equipment utilized in this phase would include a drilling rig, generators, diesel engines, water tanks, mud tanks, safety stations, equipment and material storage units, blowout preventer, an accumulator station, and a gas buster. Water for the drilling would be obtained from a commercial source and trucked to the site.
- The drill cuttings, drill water, and completion fluids would be placed in a lined reserve pit. The reserve pit would be fenced on three sides away from the pad during drilling and the fourth side fenced as soon as the rig moves out. The reserve pit would be allowed to dry or the free fluids removed by trucks to an approved disposal facility or reused in drilling operations at another well site. In addition, any other production equipment or facility for which fluids are present shall be adequately fenced and properly maintained in order to safeguard both livestock and wildlife.
- Pipeline construction activities include: excavation of trenches, stringing pipe, laying of pipe, covering of pipe, and leveling the ground surface.

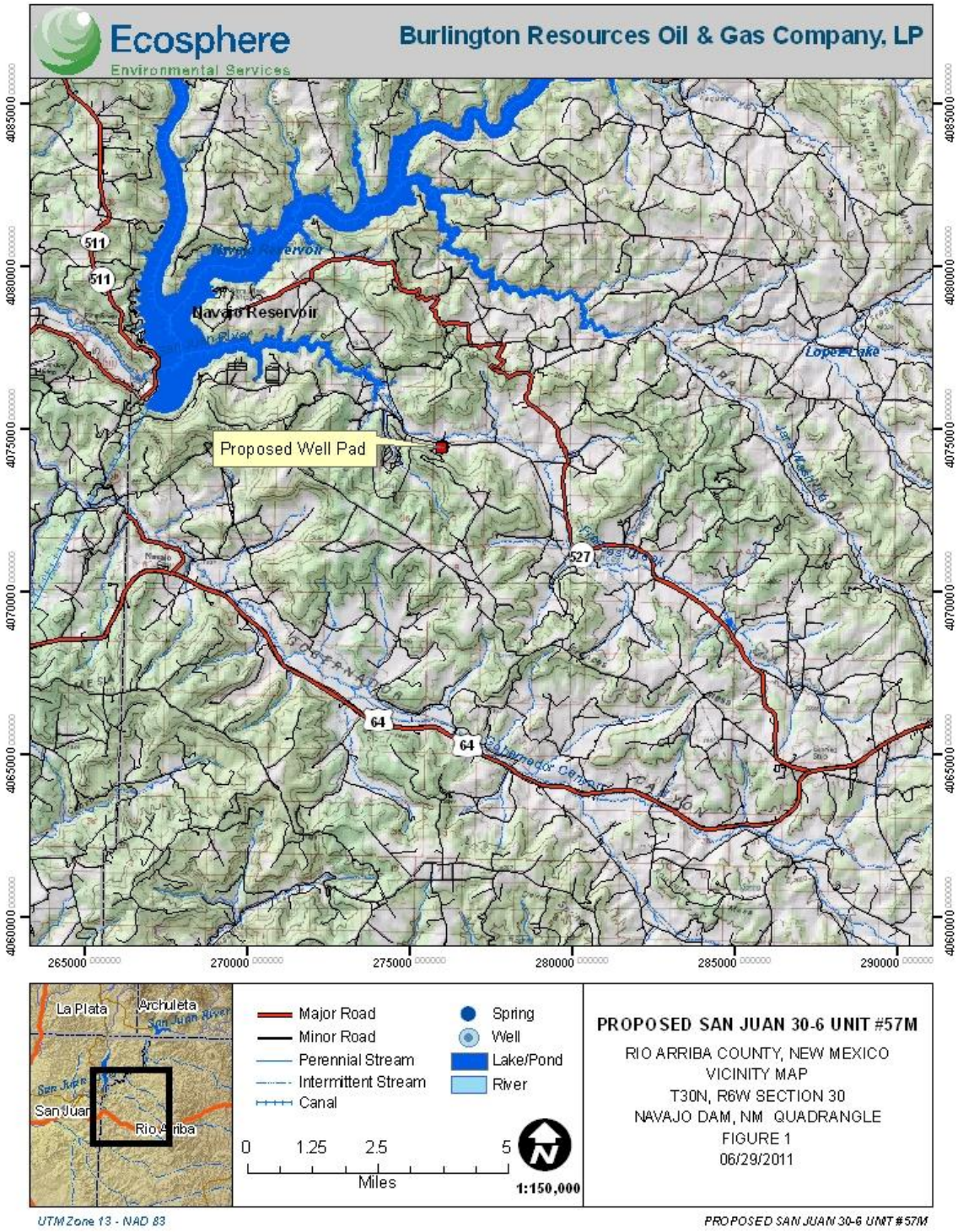
After the well is completed, a portion of the pad not required for production equipment and vehicular access would be recontoured and seeded. Approximately 1 acre for production facilities on the well pad would remain in use for production equipment and vehicle access. These areas would not be reclaimed until final abandonment of the well. Production equipment that would remain onsite would include the wellhead, production unit separator, and a meter run. Ancillary equipment such as a Christmas tree, compressor, pump jack, storage tank(s), dehydrator, and separator could also be installed at the well pad site. Equipment such as compressors or pump jacks would be powered by gas compression engines. No electric power line construction is proposed.

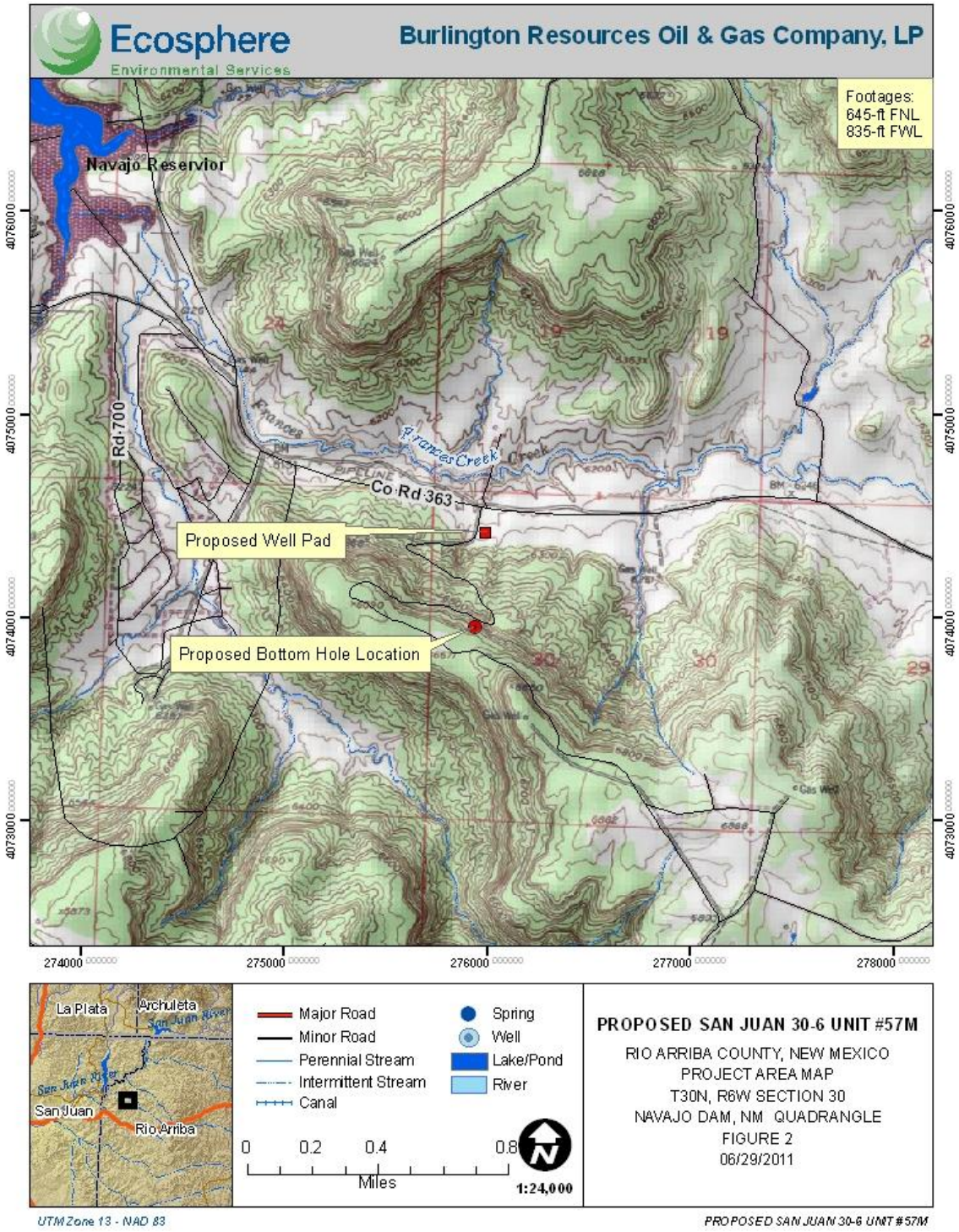
For a detailed description of design features and construction practices associated with the proposed action, refer to the project plats provided in the APD in Appendix A. Implementation of committed mitigation measures contained in the Conditions of Approval (COAs) and ROW grant stipulations are incorporated and analyzed in this alternative. The COAs are provided in Appendix B.

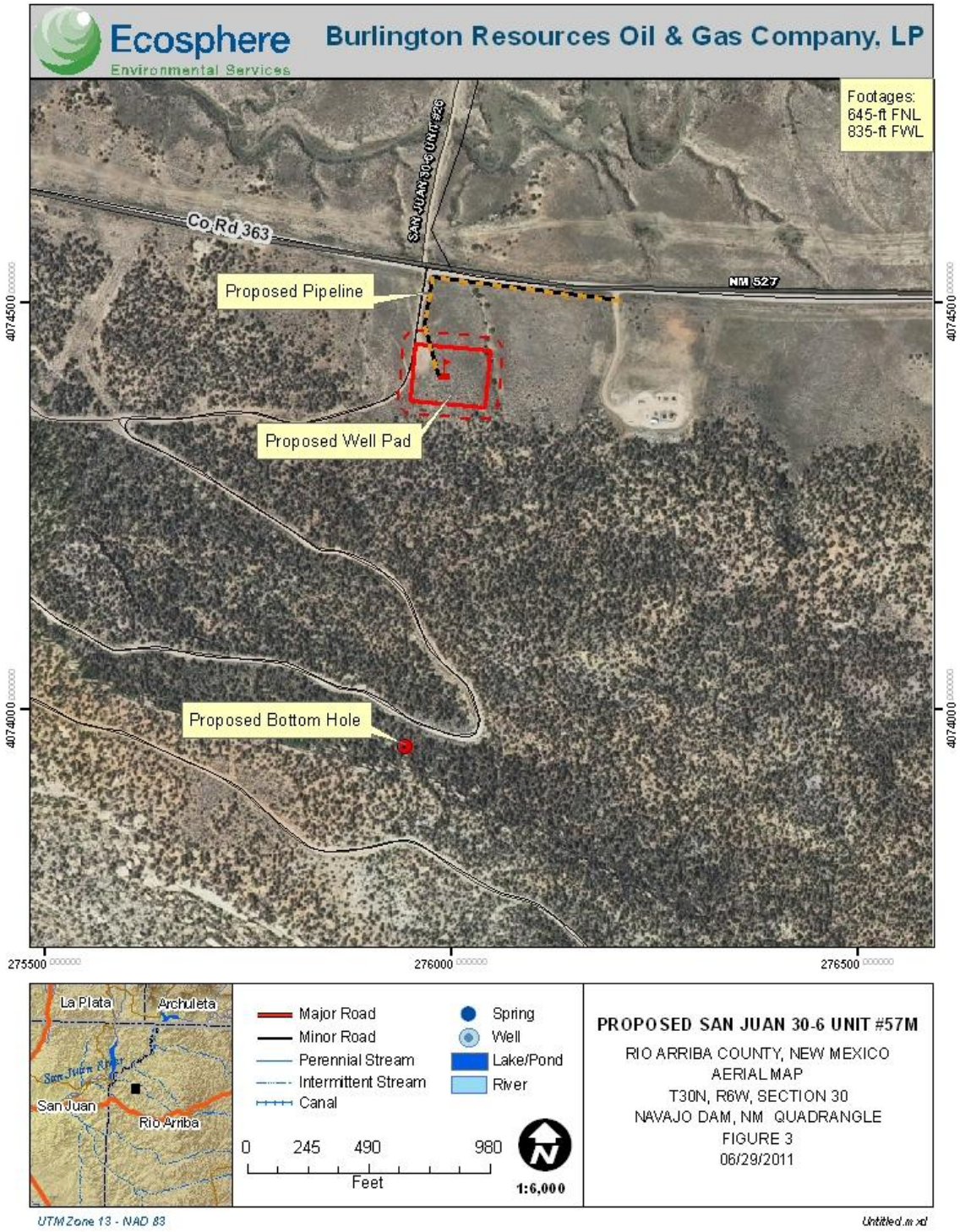
Burlington will comply with all applicable federal, state, and local laws and regulations and obtain the necessary permits for the installation of the well pad and well-tie pipeline. All areas of proposed surface disturbance were inspected in the field to ensure that potential impacts to natural resources would be minimized through the implementation of mitigation measures. Section 4.0 of this EA describes these measures for all resources potentially impacted.

2.3 Alternatives Considered But Not Analyzed in Detail

Initially, the San Jun 30-6 Unit #57M was proposed to be twinned with the San Juan 30-6 Unit #57B. The original location was rejected by the BLM/FFO during an on-site evaluation to avoid constructing an uphill pit. No other alternatives were identified that would result in less impact to resources while still meeting the purpose and need of the action.


Ecosphere
Environmental Services
Burlington Resources Oil & Gas Company, LP
Navajo Reservoir
Proposed Well Pad
Lopez Lake
511
527
64
4085000
4080000
4075000
4070000
4065000
4060000
265000
270000
275000
280000
285000
290000
La Plata
Archuleta
San Juan
Rio Arriba
Major Road
Minor Road
Perennial Stream
Intermittent Stream
Canal
Spring
Well
Lake/Pond
River
0
1.25
2.5
5
Miles
1:150,000
PROPOSED SAN JUAN 30-6 UNIT #57M
RIO ARRIBA COUNTY, NEW MEXICO
VICINITY MAP
T30N, R6W SECTION 30
NAVAJO DAM, NM QUADRANGLE
FIGURE 1
06/29/2011
UTM Zone 13 - NAD 83
PROPOSED SAN JUAN 30-6 UNIT #57M


Ecosphere
Environmental Services
Burlington Resources Oil & Gas Company, LP
Footages:
645-ft FNL
835-ft FWL
Navajo Reservior
Rd 700
Co Rd 363
Frances Creek
Proposed Well Pad
Proposed Bottom Hole Location
4076000
4075000
4074000
4073000
274000
275000
276000
277000
278000
La Plata
Archuleta
San Juan River
San Juan
Rio Arriba
Major Road
Minor Road
Perennial Stream
Intermittent Stream
Canal
Spring
Well
Lake/Pond
River
0
0.2
0.4
0.8
Miles
1:24,000
PROPOSED SAN JUAN 30-6 UNIT #57M
RIO ARRIBA COUNTY, NEW MEXICO
PROJECT AREA MAP
T30N, R6W SECTION 30
NAVAJO DAM, NM QUADRANGLE
FIGURE 2
06/29/2011
UTM Zone 13 - NAD 83
PROPOSED SAN JUAN 30-6 UNIT #57M


Ecosphere
Environmental Services
Burlington Resources Oil & Gas Company, LP
Footages:
645-ft FNL
835-ft FWL
Co Rd 363
NM 527
Proposed Pipeline
Proposed Well Pad
Proposed Bottom Hole
4074500
4074000
275500
276000
276500
La Plata
Archuleta
San Juan
Rio Arriba
Major Road
Minor Road
Perennial Stream
Intermittent Stream
Canal
Spring
Well
Lake/Pond
River
0 245 490 980
Feet
1:6,000
PROPOSED SAN JUAN 30-6 UNIT #57M
RIO ARRIBA COUNTY, NEW MEXICO
AERIAL MAP
T30N, R6W, SECTION 30
NAVAJO DAM, NM QUADRANGLE
FIGURE 3
06/29/2011
UTM Zone 13 - NAD 83
Untitled.mxd

3. DESCRIPTION OF AFFECTED ENVIRONMENT

This section describes the environment that would be affected by implementation of the alternatives described in Section 2.0. Aspects of the affected environment described in this section focus on the relevant major resources or issues. Only the aspects of the affected environment that are potentially impacted are described.

An onsite and field resource investigation of the proposed project area was conducted on April 13, 2011 by an Ecosphere Environmental Services (Ecosphere) biologist and attended by representatives from Burlington, Williams, and the BLM/FFO. Western Cultural Resource Management, Inc (WCRM) conducted cultural resource surveys on August 31 and November 15, 2010.

3.1 Critical Elements

Certain critical environmental components require analysis under BLM policy (see Appendix 5 of H-1790-1, NEPA Handbook). These requirements, listed in Table 1, are specified by statute, regulations, or Executive Order (EO). Elements that do not exist in the proposed project area or that do not have potential to be impacted are eliminated from further analysis as indicated in the table. Those elements potentially impacted by the proposed action or alternatives are described in the following sections.

Table 1. Affected Environment and Basis for Determination of No Further Analysis of Critical Elements.

CRITICAL ELEMENTS OF THE HUMAN ENVIRONMENT				
Resources	**Effected by the Proposed Action**	**Not Effected by the Proposed Action**	**Further Analysis Presented in Text**	**Basis for Determination**
Air Quality	X		X	
Areas of Critical Environmental Concern (ACECs)		X		No ACECs located within the proposed project area.
Cultural Resources		X	X	
Native American Religious Concerns		X	X	No traditional cultural properties known to occur in the proposed project area.
Environmental Justice		X	X	No adverse effects to low income or minority populations.
Farmlands, Prime or Unique		X		No prime or unique farmlands located in project area or vicinity.
Floodplains		X		No floodplains located in project area or vicinity.
Threatened or Endangered Species		X	X	

CRITICAL ELEMENTS OF THE HUMAN ENVIRONMENT				
Resources	**Effected by the Proposed Action**	**Not Effected by the Proposed Action**	**Further Analysis Presented in Text**	**Basis for Determination**
Wastes, Hazardous or Solid	X		X	Due to the handling and storage of minor volumes of fuels and lubricants during construction, and due to the presence of existing oil and gas facilities in the project area, further analysis is warranted.
Water Quality, Surface/Ground	X		X	
Wetlands/Riparian Zones		X		No wetlands/riparian areas are located in the project area.
Wild and Scenic Rivers		X		There are no wild and scenic rivers in the project area or vicinity.
Wilderness		X		There are no designated Wilderness Areas within a 25-mile radius of the proposed project.

3.1.1 Air Quality

The proposed well is located in Rio Arriba County, New Mexico. Additional general information on air quality in the area is contained in Chapter 3 of the Farmington PRMP/FEIS (BLM 2003*a*). In addition to the air quality information in the PRMP/FEIS cited above, new information about greenhouse gases (GHGs), and their effects on national and global climate conditions has emerged since this PRMP/FEIS was prepared. On-going scientific research has identified the potential impacts of GHG emissions such as carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), water vapor, and several trace gases on global climate. Through complex interactions on a global scale, GHG emissions may cause a net warming effect of the atmosphere, primarily by decreasing the amount of heat energy radiated by the earth back into space. Although GHG levels have varied for millennia (along with corresponding variations in climatic conditions), industrialization and burning of fossil carbon sources have caused GHG concentrations to increase measurably and may contribute to overall climatic changes, typically referred to as global warming.

The 2003 PRMP/FEIS (BLM 2003*a*) discussed ozone in the Baseline Air Quality and Impact Assessment sections. The National Ambient Air Quality Standard (NAAQS) at the time was 0.084 parts per million (ppm). In March of 2008, the USEPA announced a new primary 8-hour standard of 0.075 ppm.

Increased development in the Four Corners area, including a proposed new coal-fired power plant, increased oil and gas development, and population growth are all contributing to air quality concerns. Many residents are concerned with potential health impacts from other pollutants. An overall haze and

plume of nitrogen oxides can often been seen in the skies, which impact visibility, and there are concerns for the ecosystem due to deposition of mercury and nitrogen.

In addition, the USEPA, on October 17, 2006, issued a final ruling on the lowering of the NAAQS for particulate matter ranging from 2.5 micron or smaller particle size ($PM_{2.5}$). This ruling became effective on December 18, 2006, stating that the 24-hour standard for $PM_{2.5}$ was lowered to 35 micrograms per cubic meter ($\mu g/m^3$) from the previous standard of 65 $\mu g/m^3$. This revised $PM_{2.5}$ daily NAAQS was promulgated to better protect the public from short-term particle exposure.

This EA incorporates an analysis of the contributions of the proposed action to GHG emissions and a general discussion of potential impacts to climate.

Air quality and climate are the components of air resources, which include applications, activities, and management of the air resource. Therefore, the BLM must consider and analyze the potential effects of BLM and BLM-authorized activities on air resources as part of the planning and decision-making process.

The USEPA has the primary responsibility for regulating air quality, including seven nationally regulated ambient air pollutants. Regulation of air quality is also delegated to some states of which New Mexico is one. Air quality is determined by atmospheric pollutants and chemistry, dispersion meteorology, and terrain, and also includes applications of noise, smoke management, and visibility. Climate is the composite of generally prevailing weather conditions of a particular region throughout the year, averaged over a series of years. Greenhouse gases and the potential effects of GHG emissions on climate are not regulated by the USEPA; however, climate has the potential to influence renewable and non-renewable resource management.

3.1.1.1 Air Quality

The area of the proposed action is considered a Class II air quality area. A Class II area allows moderate amounts of air quality degradation. The primary sources of air pollution are dust from blowing wind on disturbed or exposed soil and exhaust emissions from motorized equipment.

Air quality in the area near the proposed project is generally good and is not located in any of the areas designated by the USEPA as “non-attainment areas” for any listed pollutants regulated by the Clean Air Act. During the summers of 2000 through 2002, ozone levels in San Juan County were approaching non-attainment. Additional modeling and monitoring was conducted by Alpine Geophysics, LLC, and Environ International Corporations, Inc., in 2003 and 2004. Results of the modeling suggest the episodes recorded in 2000 through 2002 were attributable to regional transport and high natural biogenic source emissions. The model also predicted that the region will not violate the ozone NAAQS through 2007 and that the trends in the 8-hour ozone values in the region will be declining in the future. At the present time, the San Juan County is classified as in attainment with the revised federal ozone standard of 0.075 ppm.

Greenhouse gases, including CO_2 and CH_4, and the potential effects of GHG emissions on climate, are not regulated by the USEPA under the Clean Air Act. However, climate has the potential to influence renewable and non-renewable resource management. The USEPA’s Inventory of U.S. Greenhouse Gas Emissions and Sinks found that total U.S. GHG emissions were over 7 billion metric tons in 2007 and that total U.S. GHG emissions have increased by 17 percent from 1990 to 2007. Emissions increased

from 2006 to 2007 by 1.4 percent (99.0 teragrams of carbon dioxide equivalents [Tg CO2 Eq.]). The following factors were primary contributors to this increase: (1) cooler winter and warmer summer conditions in 2007 than in 2006 increased the demand for heating fuels and contributed to the increase in the demand for electricity, (2) increased consumption of fossil fuels to generate electricity, and (3) a significant decrease (14.2 percent) in hydropower generation used to meet this demand (USEPA 2008).

The levels of these GHGs are expected to continue increasing. The rate of increase is expected to slow as greater awareness of the potential environmental and economic costs associated with increased levels of GHGs result in behavioral and industrial adaptations.

3.1.1.2 Climate

Global mean surface temperatures have increased nearly 1.0°C (1.8°F) from 1890 to 2006 (Goddard Institute for Space Studies 2007). However, observations and predictive models indicate that average temperature changes are likely to be greater in the Northern Hemisphere. Without additional meteorological monitoring systems, it is difficult to determine the spatial and temporal variability and change of climatic conditions, but increasing concentrations of GHGs are likely to accelerate the rate of climate change.

In 2007, the Intergovernmental Panel on Climate Change (IPCC) predicted a warming of about 0.2°C per decade for the next two decades, and then a further warming of about 0.1°C per decade (IPCC 2007). The National Academy of Sciences (2006) supports these predictions, but has acknowledged that there are uncertainties regarding how climate change may affect different regions. Computer model predictions indicate that increases in temperature will not be equally distributed but are likely to be accentuated at higher latitudes. Warming during the winter months is expected to be greater than during the summer, and increases in daily minimum temperatures are more likely than increases in daily maximum temperatures.

A 2007 U.S. Government Accountability Office (GAO) Report on Climate Change found that, "federal land and water resources are vulnerable to a wide range of effects from climate change, some of which are already occurring. These effects include, among others: 1) physical effects such as droughts, floods, glacial melting, and sea level rise; 2) biological effects, such as increases in insect and disease infestations, shifts in species distribution, and changes in the timing of natural events; and 3) economic and social effects, such as adverse impacts on tourism, infrastructure, fishing, and other resource uses." It is not, however, possible to predict with any certainty regional or site-specific effects on climate relative to the proposed action and subsequent actions.

In New Mexico, a recent study indicated that the mean annual temperatures have exceeded the global averages by nearly 50 percent since the 1970s (Enquist and Gori 2008). Similar to trends in national data, increases in mean winter temperatures in the southwest have contributed to this rise. When compared to baseline information, periods between 1991 and 2005 show temperature increases in over 95 percent of the geographical area of New Mexico. Warming is greatest in the northwestern, central, and southwestern parts of the state (Enquist and Gori 2008).

3.1.2 Cultural Resources

The project is located within the archaeologically rich San Juan Basin of northwestern New Mexico. In general, the prehistory of the San Juan Basin can be divided into five major periods: PaleoIndian (ca.

10000 B.C. to 5500 B.C.), Archaic (ca. 5500 BC to A.D. 400), Basketmaker II-III and Pueblo I-IV periods (A.D. 1-1540), and the historic (A.D. 1540 to present), which includes Native American as well as later Hispanic and Euro-American settlers. A detailed description of these various periods and select phases within each period is provided in the Farmington PRMP/FEIS (BLM 2003*a*).

The proposed San Juan 30-6 Unit #57M natural gas well would be within the Navajo Reservoir sub-watershed. Based on the Farmington PRMP/FEIS (BLM 2003*a*), a total of 4,329 sites representing Archaic Period, Basketmaker II, Basketmaker III, Unknown Anasazi, Pueblo I, Pueblo II, Pueblo III, Pueblo IV, Unknown Navajo, Dinétah/Gobernador Phase, Cabezon Phase, Reservation Phase, Hispanic, Euro-Anglo, Apache, and General Unknown temporal/cultural components have been documented within the watershed. Of the 19 categories of sites defined based on temporal/cultural affiliation, 17 are represented. Lacking in the watershed are sites attributed to Paleo and Ute occupations. The most frequently occurring cultural affiliations recorded are Pueblo I (41%) and Dinétah/Gobernador (15%). Site density is high with any apparent gaps most likely a factor of lacking inventory and not a lack of sites.

The entire area of potential affect for the proposed project was surveyed by Western Cultural Resource Management, Inc. (WCRM) at a BLM Class III level (100%) and an inventory report was prepared and submitted to the BLM in accordance with the *Procedures for Performing Cultural Resources Fieldwork on Public Lands in the Area of New Mexico BLM Responsibilities* (BLM 2005). Prior to field surveys of the proposed project area, an investigation of records at the BLM/FFO and an online search of Archeological Records Management Section (ARMS) were conducted to determine if any sites had been recorded within 0.25 mile of the survey area. WCRM surveyed the proposed well pad, construction zone, and the proposed pipeline for a total of 11.60 acres.

One site (LA170217) was documented during the surveys [WCRM Report (F) 1006; BLM 2011(III)075F].

3.1.3 Native American Religious Concerns

Traditional Cultural Prosperities (TCPs) is a term that has emerged in historic preservation management and the consideration of Native American religious concerns. TCPs are places that have cultural values that transcend, for instance, the values of scientific importance that are normally ascribed to cultural resources such as archaeological sites. The National Park Service has defined TCPs as follows:

> A traditional cultural property can be defined generally as one (a property) that is eligible for the National Register because of its association with cultural practices or beliefs of a living community that (a) are rooted in that community's history, and (b) are important in maintaining the continuing cultural identity of the community (Parker and King 1998:1).

Native American cultural associations are the "communities" most likely to identify TCPs, although TCPs are not restricted to this group. Some TCPs are well known, while others may only be known to a small group of traditional practitioners, or otherwise only vaguely known.

There are several pieces of legislation or Executive Orders that should be considered when evaluating Native American religious concerns. These govern access and use of scared sites, possession of sacred items, protection and treatment of human remains, and the protection of archaeological resources ascribed with religious or historic importance. These include the following: American Indian Religious Freedom Act (AIRFA) of 1978, EO 13007, The Native American Graves Protection and Repatriation Act (NAGPRA) of 1990, and the Archaeological Resources Protection Act (ARPA) of 1979.

For the Proposed Action, identification of TCPs were limited to reviewing existing published and unpublished literature (e.g. Van Valkenburgh 1941, 1974; Brugge 1993; Kelly et al 2006), and the site-specific cultural resources survey report conducted for the Proposed Action. In addition, the BLM's cultural resources program was contacted for information regarding the presence of TCPs identified through ongoing BLM tribal consultation efforts. The proposed project area is not located within any known TCPs).

3.1.4 Environmental Justice

EO 12898 requires federal agencies to assess projects to ensure there is no disproportionately high or adverse environmental, health, or safety effects on minority and low income populations. Minorities comprise a large proportion of the population residing inside the boundaries of the BLM/FFO (see pages 3-106 to 3-107 of the PRMP/FEIS [BLM 2003*a*] for more details on ethnicity and poverty rates).

3.1.5 USFWS Threatened and Endangered Species

Under Section 7 of the Endangered Species Act (ESA) of 1973 (as amended), the BLM is required to consult with the USFWS on any proposed action that may affect federally listed threatened or endangered species or species proposed for listing. The Biological Survey Report (BSR) completed by Ecosphere addresses the potential for federally listed and other special status species to occur in the project area (see Appendix C). Table 2 summarizes the potential for federally listed species to occur in the project area.

Table 2. Habitat Descriptions and Presence of USFWS listed Threatened (T), Endangered (E), Proposed Threatened (P), or Candidate (C) Species with Potential to Occur in Rio Arriba County, New Mexico

SPECIES	STATUS	HABITAT ASSOCIATIONS	PRESENCE
MAMMALS			
Black-footed ferret (*Mustela nigripes*)	E	Open grasslands with year-round prairie dog colonies of 200 acres or greater.	NP
Canada lynx (*Lynx canadensis*)	C	Generally occurs in boreal and montane forests dominated by coniferous or mixed forest with thick undergrowth.	NP
Gunnison's prairie dog (*Cynomys gunnisoni*)	C	Primarily inhabits grass/forb/shrub habitats on abandoned land, valley floors, stream valleys, mountain meadows, high-elevation plateaus and benches, and intermountain valleys.	NP

SPECIES	STATUS	HABITAT ASSOCIATIONS	PRESENCE
New Mexico meadow jumping mouse (*Zapus hudsonius luteus*)	C	Nests in dry soils but uses moist, streamside, dense riparian/wetland vegetation in mountainous areas.	NP
BIRDS			
Least tern (*Sterna antillarum*)	E	Colonies found on bare or sparsely vegetated sand or dried mudflats along coasts or rivers; also sandy islands and gravel and sand pits.	NP
Southwestern willow flycatcher (*Empidonax traillii extimus*)	E	Breeds in dense, shrubby riparian habitats, usually in close proximity to surface water or saturated soil.	NP
Mexican spotted owl (*Strix occidentalis lucida*)	T	Nests in caves, cliffs, or trees in steep-walled canyons of mixed conifer forests.	NP
Yellow-billed cuckoo (*Coccyzus americanus ssp. occidentalis*)	C	Breeds in riparian woodlands with dense, understory vegetation.	NP
FISH			
Rio Grande silvery minnow (*Hybognathus amarus*)	E	Prefers large streams with slow to moderate currents over a mud, sand, or gravel bottom.	NP
Rio Grande cutthroat trout (*Oncorhynchus clarki virginalis*)	C	Prefers clear mountain streams or lakes with large substrate in the Rio Grande watershed.	NP
Roundtail chub (*Gila robusta*)	C	Occurs in large rivers and streams in the Upper Colorado River Basin.	NP
AMPHIBIANS			
Jemez Mountains salamander (*Plethodon neomexicanus*)	C	Restricted to coniferous forests dominated by Douglas fir, spruce, ponderosa pine and white fir above 7,200 feet in elevation.	NP

Key: **K**- Known, documented observation within project area; **S** – Suitable habitat and species suspected to occur within the project area; **NS** - Habitat suitable but species is not suspected to occur within the project area; **NP** - Habitat not present and species unlikely to occur within the project area. Source: USFWS 2011.

No federally listed species with the potential to occur in Rio Arriba County, or potential habitats of federally listed species, were observed within the proposed project area.

3.1.6 Wastes, Hazardous or Solid

The Resource Conservation and Recovery Act (RCRA) passed in 1976, establishes a comprehensive program for managing hazardous wastes from the time they are produced until their disposal. The USEPA regulations define solid wastes as any "discarded materials" subject to a number of exclusions. A "hazardous waste" is a solid waste that (1) is listed by the USEPA as a hazardous waste, (2) exhibits any of the characteristics of hazardous wastes (ignitability, corrosively, reactivity, or toxicity), or (3) is a mixture of solid and hazardous waste. A 1980 amendment to RCRA conditionally exempted from regulation as hazardous wastes "drilling fluids, production waters, and other wastes associated with the exploration, development, or production of crude oil or natural gas or geothermal energy." On July 6, 1988, USEPA determined that oil and gas exploration, development, and production (EDP) wastes would not be regulated as hazardous wastes under RCRA. A simple rule of thumb was developed for determining if an EDP waste is likely to be considered exempt or non-exempt from RCRA regulations: if (1) the waste came from down-hole, or (2) the waste was generated by contact with the oil and gas production stream during removal of produced water or other contaminants, the waste is most likely to be considered exempt by USEPA. The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), passed in 1980, deals with the release (spillage, leaking, dumping, accumulation, etc.) or threat of a release of hazardous substances into the environment. Despite many oil and gas constituent wastes being exempt from hazardous waste regulations, certain RCRA exempt contaminants could be subject to regulations as hazardous substances under CERCLA. The New Mexico Oil Conservation Division (OCD) administers hazardous waste regulations for oil and gas activities in New Mexico.

3.1.7 Water Quality, Surface and Groundwater

The project area is located in the Upper Colorado River Hydrologic Region and is part of the Navajo watershed. One drainage is located in the east portion of the proposed project area. The ephemeral wash is approximately 15 to 20-feet wide by approximately 10 feet deep with the current high water mark approximately 1-foot wide by less than 6-inches deep. Surface runoff would flow north from the proposed project area to Frances Creek and then northwest into the Frances Creek Arm of Navajo Reservoir. There are no perennial surface water resources in the form of rivers, lakes, ponds or streams, nor any wetlands, springs, or riparian habitats within the proposed project area.

The primary aquifers in the BLM/FFO area are the sandstone based Uinta-Animas and the Mesaverde. Groundwater is readily available in most of the BLM/FFO area and is of fair to poor quality. A search of the New Mexico State Engineers Office-Water Administration and Technical Engineering Resource System (WATERS) database for the proposed project area and vicinity (1-mile radius) was performed. There are no water wells located within 1-mile of the proposed project.

3.2 Non-Critical Elements

Non-critical elements include resources that may be affected by the proposed action or alternatives but are not necessarily required to be analyzed by statute, regulation, or EO. Table 3 lists non-critical elements that are either eliminated from further analysis in the table or are discussed further in this EA as they pertain to management objectives outlined in the BLM/FFO PRMP/FEIS (BLM 2003*a*).

Table 3. Affected Environment and Basis for Determination of No Further Analysis of Non-Critical Elements.

NON-CRITICAL ELEMENTS				
Resources	**Effected by the Proposed Action**	**Not Effected by the Proposed Action**	**Further Analysis Presented in Text**	**Basis for Determination**
Topography/Surface Geology	X		X	
Mineral Resources	X		X	
Paleontology		X	X	The project area is located within a PFYC designated Class 5 area.
Soils	X		X	
Vegetation, Forestry	X		X	
Invasive, Non-native Species	X		X	
Livestock Grazing	X		X	
Special Status Species	X		X	
Wildlife	X		X	
Migratory Birds	X		X	
Wild Horses and Burros		X		There are no wild horse or burro populations in or near the project area.
Recreation	X		X	
Visual Resources	X		X	
Public Health and Safety	X		X	

Key: PFYC = Potential Fossil Yield Classification.

3.2.1 General Topography/Surface Geology

The proposed project area would be located 400 feet south of Frances Creek and in the flats below the northwest tip of Frances Mesa approximately 11 miles northwest of U.S. Highway 64 off New Mexico State Highway 527 and 16 miles east of Navajo Dam, New Mexico. The region is characterized by open, mildly rolling mesa top terrain interspersed with deep canyons and washes. The proposed action would be located on a level plain at the base of Frances Mesa with gently rolling mesa tops surrounded by steep, terraced sandstone cliffs that contain cliff faces up to 500 feet high. The slopes within the proposed well pad range from 2 to 3 degrees with steeper slopes at the cut slope on the southeast side of the well pad and construction zone. The overall aspect in the proposed project area is northeast towards Frances Creek, a tributary to Navajo Reservoir. The slopes are gradual from the proposed project area into Frances Creek but the slopes become steeper in the southeast corner of the proposed project where it abuts Frances Mesa. Elevation of the proposed project is 6,228 feet. The principle geological formation underlying the proposed project area is the San Jose Formation.

3.2.2 Mineral Resources

Natural gas production in the San Juan basin occurs at the highest rate in the state of New Mexico, with approximately 650 to 700 million thousand cubic feet (Mcf) produced annually. The proposed natural gas well would produce natural gas from valid existing federal leases for the minerals associated with the proposed development formation. The proposed well-tie pipeline would transport natural gas from the proposed gas well into the regional natural gas transmission system.

There are no coal mines or salable mineral extraction projects operating in the vicinity of the proposed project.

3.2.3 Paleontology Resources

The proposed project area is located within the paleontological rich area of the San Juan Basin of northern New Mexico. The BLM uses the Potential Fossil Yield Classification (PFYC) system to identify areas with a high potential to produce significant fossil resources (IM 2008-009). This system has ranked all lands within the BLM/FFO management area as a Class 5 designation. Class 5 designations are described as being Very High Potential paleontological resource areas, thus requiring an assessment at the project level (IM 2008-011).

3.2.4 Soils

Soils in the San Juan Basin were formed primarily in two kinds of parent material: alluvial sediment and sedimentary rock. Alluvial sediment is material that was deposited in river valleys and on mesas, plateaus, and ancient river terraces. Sedimentary parent material consists mainly of sandstone and shale bedrock. These shale and resistant sandstone beds form prominent structural benches, buttes, and mesas bounded by cliffs.

Soils in the project area consist of the Orlie fine sandy loam, 1 to 8 percent slopes. Orlie fine sandy loam, 1 to 8 percent slopes, is found on broad valley side slopes. This unit consists of 90 percent Orlie soil and 10 percent contrasting inclusions. Vosburg soils containing surface organic matter comprise the inclusions. Orlie soil is very deep and well drained. It is alluvial and eolian in origin and derived from shale and sandstone. Orlie soil has moderately slow permeability, high to very high available water capacity, medium runoff, and moderate to severe hazard of water erosion. The shrink/swell potential of this soil is moderate (USDA/NRCS 2007).

3.2.5 Vegetation, Forestry

The proposed project would be located in an area where 30 percent of the land has been previous disturbed due to an existing road. Approximately 30 percent of the previous disturbance has remained bare or with little vegetation that consists of prickly Russian thistle (*Salsola tragus*), cheatgrass (*Bromus tectorum).* The undisturbed portion of the proposed project area is located in an desert scrub vegetation community dominated by big sage (*Artemisia tridentata*) and James' galleta (*Pleuraphis jamesii).* Ground cover in the undisturbed portion was visually estimated to be 30 percent. The vegetation community surrounding the proposed project area consists of a piñon pine (*Pinus edulis*)-Utah juniper (*Juniperus osteosperma*) woodland and an open desert scrub community.

3.2.6 Invasive, Non-Native Species

The BLM/FFO maintains a list of invasive and non-native plant species of concern (BLM 2003*a*). No BLM-listed invasive plant species of concern were present in the proposed San Juan 30-6 Unit #57M project area. A list of plants found during the field survey is included in the BSR in Appendix C.

3.2.7 Special Status Species

In accordance with BLM Manual 6840, the BLM manages certain sensitive species not federally listed as threatened or endangered in order to prevent or reduce the need to list them as threatened or endangered in the future. Table 4 lists the special status species and their potential to occur in the proposed project area. The BSR in Appendix C provides the basis for the findings listed in the table.

The project area includes potential foraging habitat for golden eagles (*Aquila chrysaetos*), peregrine falcons (*Falco peregrinus anatum*), and prairie falcons (*Falco mexicanus*). The cliff faces associated with Frances Mesa surrounding the proposed project area provide potential nesting substrate for these raptors. Based on field survey results, no nesting habitat for golden eagles, peregrine falcons, or prairie falcons occurs within the proposed project area. However, the cliffs associated with Frances Mesa that are within 0.2 mile of the proposed project area contain potential raptor nesting habitat. According to the BLM/FFO, there are several golden eagle and peregrine falcon nesting territories within 10-12 miles of the proposed well pad. No raptors, or sign of consistent raptor use such as whitewash or nests, were observed or recorded in the proposed project area or within an estimated 1/3-mile radius.

Table 4. Habitat Descriptions and Presence of BLM/FFO Special Status Species.

SPECIES	HABITAT ASSOCIATIONS	PRESENCE*
Golden eagle (*Aquila chrysaetos*)	In the west, mostly open habitats in mountainous, canyon terrain. Nests primarily on cliffs and trees.	S
Burrowing owl (*Athene cunicularia*)	Rarely dig their own burrows and are typically associated with prairie dog colonies.	NP
Ferruginous hawk (*Buteo regalis*)	Flat or rolling terrain in grasslands, shrub-steppes, and deserts; may occur in the periphery of piñon-juniper or other forests. Badlands. Prefers elevated nest sites (e.g., buttes, utility poles, trees) but also nests on the ground.	NP
Mountain plover (*Charadrius montanus*)	Breeds in flat, open grasslands; often associated with prairie dog towns and intensive grazing.	NP
Yellow-billed cuckoo (*Coccyzus americanus occidentalis*)	Breeds in riparian woodlands with dense, understory vegetation.	NP
Prairie falcon (*Falco mexicanus*)	Found in arid, open grasslands and shrub-steppe habitats. Prairie falcons require cliffs for nesting.	S
American peregrine falcon (*Falco peregrinus anatum*)	Rugged terrain with rocky cliffs and canyons (30-1,000+ feet high), adjacent to rivers, lakes, or streams. Urban areas with towers and buildings are also inhabited.	S

SPECIES	HABITAT ASSOCIATIONS	PRESENCE*
Bald eagle (*Haliaeetus leucocephalus*)	Nests in forested areas adjacent to large bodies of water.	NP
Aztec gilia (*Aliciella formosa*)	Salt desert scrub communities in soils of the Nacimiento Formation (5,000-6,000 feet).	NP
Brack's hardwall cactus (*Sclerocactus cloveriae ssp. brackii*)	Sandy clay of the Nacimiento Formation in sparse shadscale scrub (5,000-6,000 feet).	NP

Key: **K** - Known, documented observation within project area; **S** - Habitat suitable and species suspected to occur within the project area; **NS** - Habitat suitable but species is not suspected to occur within the project area; **NP** - Habitat not present and species unlikely to occur within the project area.

3.2.8 Wildlife

Signs of wildlife observed within the proposed project area indicated the presence of desert cottontail (*Sylvilagus audubonii*), black-tailed jackrabbit (*Lepus californicus*), mule deer (*Odocoileus hemionus*) and elk (*Cervus canadensis*). A list of wildlife species observed within the proposed project area is provided in the project BSR in Appendix C.

3.2.9 Migratory Birds

Under the Migratory Bird Treaty Act (MBTA) (16 USC §703-712) and EO 13186, "Responsibilities of Federal Agencies to Protect Migratory Birds," federal agencies are required to consider management impacts to migratory non-game birds. While all migratory songbirds are protected by law, certain species have been determined to be at greater risk than others. More than 350 avian species occur in San Juan County and the surrounding area administered by the BLM/FFO. A total of 136 species have been confirmed as breeding in San Juan County with likely additional species if one considers the adjacent counties within the BLM/FFO area. Data collected through breeding bird surveys coordinated by the USFWS as well as other private sector efforts have provided the basis for the New Mexico Partners in Flight (NMPIF) organization to develop bird "Watch Lists" and the USFWS's "Birds of Conservation Concern List." The NMPIF organization has identified priority species of birds for the state of New Mexico by habitat type. The BLM/FFO area lies within the Colorado Plateau physiographic region as identified by the NMPIF. The proposed project area contains one of the habitat types addressed in these documents: Great Basin desert shrub (sage/grass). Some of the birds listed as "Highest Priority" by the NMPIF group as well as USFWS "Birds of Conservation Concern" includes the ferruginous hawk (*Buteo regalis*), gray vireo (*Vireo vicinior*), piñon jay (*Gymnorhinus cyanocephalus*), and juniper titmouse (*Baeolophus ridgwayi*).

The Bird Conservation Plan developed for the State of New Mexico by NMPIF lists the sage thrasher (*Oreoscoptes montanus*) and sage sparrow (*Amphispiza belli*) within the Great Basin desert shrub habitat type as "highest priority" species for conservation. The ferruginous hawk, mountain plover (*Charadrius montanus*), and long-billed curlew (*Numenius americanus*) are listed as a "highest priority" species under the Plains and Mesa grassland habitat type. Most of the priority bird species identified by the NMPIF also occur on the USFWS Division of Migratory Bird Management "Birds of Conservation Concern 2008"

within Bird Conservation Region 16 – Southern Rockies/Colorado Plateau. Birds included on this list are those "species, subspecies, and populations of all migratory non-game birds that, without additional conservation actions, are likely to become candidates for listing under the ESA of 1973" (USFWS 2008).

The piñon-juniper woodland habitat near the proposed project area provides foraging and roosting habitat for large raptors, including golden eagles, prairie falcons, and red-tailed hawks (*Buteo jamaicensis*). A variety of bird species may be found in the proposed project area such as Bendire's thrasher (*Toxostoma bendirei*), loggerhead shrike (*Lanius ludovicianus*), and vesper sparrow (*Pooecetes gramineus*). Certain birds, including the juniper titmouse, western scrub jay (*Apelocoma californica*), and bushtit (*Psaltriparus minimus*), nest almost exclusively in piñon-juniper habitats. Mountain chickadees (*Parus gambeli*), black-throated gray warblers (*Dendroica nigrescens*), and blue-gray gnatcatchers (*Polioptila caerulea*) also occur in this community (NMPIF 2007).

The open scrub habitat in and surrounding the proposed project area provides foraging habitat for large raptors. Black-throated sparrows (*Amphispiza bilineata*), Brewer's sparrows (*Spizella breweri*), and mountain bluebirds (*Sialia currucoides*) can also occur in this community (NMPIF 2007).

3.2.10 Grazing

The BLM/FFO manages 167 grazing allotments with 351 grazing authorizations that permit cattle, sheep, and horse grazing within the resource area. Of the 351 grazing authorizations, 317 are permitted under Section 3 of the Taylor Grazing Act. Of the 167 grazing allotments, there are four authorizations issued under Section 15 of the Taylor Grazing Act to the Navajo Tribe that authorizes grazing on 35 allotments. An additional 30 authorizations under Section 15 authorizes permit grazing on 30 allotments in the Lindrith, NM area.

The proposed project is located within BLM/FFO grazing allotment #5059 (Francis Mesa AMP). Allotment #5059 is permitted for 100 sheep between November 1 and May 31 for a total of 81 animal unit months (AUMs) and for 18 horses between November 1 and February 28 for a total of 81 AUMs.

3.2.11 Recreation

The Farmington Field Office has set aside several areas for special use and manages them as Specially Designated Areas (SDA). Recreation SDA's are managed to accommodate a large variety of recreational uses and outdoor recreational experiences. Areas located outside of recreation SDAs are managed as Extensive Recreation Management Areas (ERMAs). Few recreation facilities or supervisory efforts exist on these lands and they are managed to maintain a freedom of recreation choice with limited regulatory constraints. The proposed action area would not be in a SDA for recreation. Dispersed recreational use of the areas may include occasional hunting during the hunting season, hiking, and wildlife viewing. Recreation in the proposed project area consists of dispersed activities such as hiking and hunting. There are no designated special recreation areas near the proposed action.

Visual Resources

The proposed project area is within the San Juan Basin, an area visually characterized by steep colorful escarpments, narrow vistas and rugged canyons. The majority of the proposed project area would be

located on previously disturbed terrain associated with oil and gas development. The vicinity of the project area consists of primarily desert scrub shrub and piñon-juniper woodland habitat interspersed with deep canyons.

The BLM has developed a VRM classification system designed to maintain or enhance visual qualities and describe the different degrees of modification to the landscape (BLM 2003*a*). VRM on public lands is conducted in accordance with BLM Handbook 8410 and BLM Manual 8411. Further details of the BLM/FFO VRM Program are contained on pages 2-9 to 2-10 and 3-61 to 3-63 of the Farmington PRMP/FEIS (BLM 2003*a*). Modifications to the visual resource must follow the guidelines for the types of change suitable for each class. The proposed project area is located within a designated Class IV VRM area. Development in Class IV VRM areas allows for major modification of the landscape (BLM 2003*a*).

3.2.12 Public Health and Safety

Public risk associated with natural gas development includes increased traffic on public roads, wildfire, pipeline leakage, rupture, fire, and explosion. Additional public health and safety risks include spills of wastes, chemicals, or hazardous materials. Roads in the area are generally unimproved dirt surface and are used to access natural gas facilities. These roads may become hazardous or impassable during periods of inclement weather.

4. ENVIRONMENTAL CONSEQUENCES

Environmental resources can be affected in many ways during implementation of the proposed action. The effect, or impact, is defined as any change or alteration in the pre-existing condition of the environment produced by the proposed action, either directly or indirectly. This chapter analyzes the environmental consequences of the proposed action.

Impacts can be either long term (permanent, residual) or short term (incidental, temporary). Short-term impacts affect the environment for only a limited time period, and the environment usually reverts rapidly to the pre-construction condition. Short-term impacts are often disruptive and obvious. Long-term impacts are substantial and permanent alterations to the pre-project environment. The BLM defines long-term impacts as those impacts whose results endure more than five years. Impacts may be irreversible or residual and affected resources irretrievable.

For the purpose of this EA, potential impacts have been divided into three categories:

> **High** - as defined in Council on Environmental Quality guidelines (40 CFR 1500-1508), impacts that are substantial in severity and therefore should receive the greatest attention in decision making.
>
> **Moderate** - impacts that cause a degree of change that is easy to detect but do not meet the criteria for significant impacts.
>
> **Low** - impacts that cannot be easily detected and cause little change in the existing environment.

No Action Alternative

Under the no action alternative, the proposed natural gas well pad would not be constructed nor the well drilled. The well-tie pipeline would not be constructed. There would be no new impacts from oil and gas production to resources in the project area. The no action alternative would result in the continuation of the current land and resource uses in the project area. This alternative will not be evaluated further in Chapter 4.

Action Alternative - Proposed Action

Drilling of the proposed San Juan 30-6 Unit #57M natural gas well would require construction of a 230-foot (ft) by 300-ft well pad with a 50-ft wide construction zone around the perimeter of the pad that would disturb approximately 3.03 acres. The proposed project would require a maximum 13-foot cut and 11-foot fill to provide a level well pad for drilling. The proposed well-tie pipeline would be approximately 1,165-feet in length and constructed within a 40-foot wide ROW. Total surface disturbance for the proposed project would be 3.94 acres. Approximately 1 acre of the entire proposed project would be subject to long-term disturbance associated with the natural gas well operation. The potential environmental consequences and proposed mitigation measures for this alternative are described for both critical and non-critical elements in the following sections.

4.1 Air Resources

4.1.1 Direct and Indirect Effects

Air Quality

Local air quality would temporarily be directly impacted with pollution from exhaust emissions, chemical odors, and dust that would be caused by the motorized equipment used to construct the well pad and pipeline, and by the drilling rig that will be used to drill the well. Dust dissemination would discontinue upon completion of the construction phase. Air pollution from the motorized equipment would discontinue at the completion of the drilling phase of the operations. The winds that frequent the northwestern part of New Mexico generally disperse the odors and emissions. The impacts to air quality would be greatly reduced as the construction and drilling phases are completed. Other factors that currently affect air quality in the area include dust from livestock herding activities, recreational use, and use of roads for vehicular traffic.

Over the last 10 years, the leasing of federal oil and gas mineral estate in the BLM/FFO administrative area has resulted in an average total of approximately 450 to 500 wells drilled on federal leases annually. These wells would contribute an incremental increase to the total emissions (including GHGs) from oil and gas activities in New Mexico.

Potential impacts of development could include increased air borne soil particles blown from new well pads or roads, exhaust emissions from drilling equipment, compressors, vehicles, and dehydration and separation facilities, as well as potential releases of GHGs, nitrogen oxide (NOx), and volatile organic compounds (VOCs) during drilling or production activities. The amount of increased emissions cannot be quantified at this time since it is unknown how many wells might be drilled, the types of equipment needed if a well were to be completed successfully (e.g., compressor, separator, dehydrator), or what technologies may be employed by a given company for drilling any new wells. The degree of impact will also vary according to the characteristics of the geologic formations from which production occurs.

The reasonable and foreseeable development scenario developed for the Farmington PRMP/FEIS (BLM 2003*a*) demonstrated 522 wells would be drilled annually for federal minerals. Current APD permitting trends within the field office confirm that these assumptions are still accurate. This level of exploration and production would contribute a small incremental increase in overall hydrocarbon emissions, including GHGs, NOx, and VOCs released into the planet's atmosphere. When compared to total national or global emissions, the amount released as a result of potential production from the proposed well would not have a measurable effect on climate change due to uncertainty and incomplete and unavailable information; therefore it is not possible to determine the effects on climate change on a regional, national, or global scale.

Consumption of oil and gas developed from the proposed well is expected to produce GHGs, NOx, and VOCs. Consumption is driven by a variety of complex interacting factors, including energy costs, energy efficiency, availability of other energy sources, economics, demography, and weather or climate. Regional and global transportation, metropolitan traffic, fires (including wildfires, controlled burns, and use of domestic fire places), and power plant emissions from the west are all parts of the equation. Regional air quality modeling conducted for the Northern San Juan Basin Coal Bed Methane FEIS Project in August 2006 determined that potential cumulative visibility impacts to Federal Prevention of

Significant Deterioration Class I Areas (Mesa Verde National Park and the Weminuche Wilderness Area) could occur at some unspecified time in the future (USDI/USDA 2006).

The NAAQS are set for the most common and widespread pollutants. The standards are concentrations of air pollution above which the USEPA has determined that serious health and welfare consequences could occur. If the concentrations are below the NAAQS, there are no expected adverse effects to humans and the environment.

Climate

The assessment of GHG emissions and climate change is in its formative phase. It is currently not feasible to know with certainty the net impacts from the proposed action on climate. The inconsistency in results of scientific models used to predict climate change at the global scale, coupled with the lack of scientific models designed to predict climate change on regional or local scales, limits the ability to quantify potential future impacts of decisions made at this level. When further information on the impacts to climate change is known, such information would be incorporated into the BLM/FFO's planning and NEPA documents as appropriate.

4.1.2 Mitigation Measures

The BLM/FFO has been a participant of the Four Corners Air Quality Task Force (FCAQTF) since its inception in 2002 when it was known as the Four Corners Ozone Task Force. Because of the unanswered questions raised by these modeling efforts, the FCAQTF has continued to look at air quality issues in the Four Corners region. The FCAQTF is comprised of a broad base of representatives including federal, state, Indian, and local governments, as well as industry, interest groups, and concerned community members. The FCAQTF has several working groups that worked on the development of a mitigation options report (completed December 2007) to serve as a resource and guide to the regulatory agencies. The responsible agencies may use the report as the basis for developing air quality management plans for the region. This may include developing new and revising existing regulations, supporting new legislation, developing new outreach and information programs, and developing and/or expanding voluntary programs for emission reductions.

Additional air quality modeling conducted since completion of the 2003 FEIS/PRMP and provisions in the ROD for the FEIS/PRMP provide for applications of additional emission controls if requested by the New Mexico Air Quality Bureau (NMAQB). Based on this modeling, the NMAQB issued an interim directive that all newly issued APDs limit compressor emissions to no more than 2 grams per horsepower hour of N_2O for engines of 300 horsepower or less. The BLM/FFO has complied with this directive through a condition of approval (COA) that has been in effect since August 1, 2005. To date, NMAQB has made no other such requests.

Currently, development on federal minerals in New Mexico's San Juan Basin is at a lower level than forecast in the Reasonable Foreseeable Development (RFD) Scenario prepared in 2001 for the BLM/FFO PRMP/FEIS (BLM 2003*a*). The impacts forecast by the RFD are still valid. At the time the 2003 PRMP/FEIS was written, ozone readings did not represent a violation of the NAAQS for this pollutant. The NMED Air Quality Bureau has determined that the 2007 - 2009 ozone design value for San Juan

County is 0.070 ppm. The design value for the county must be greater than the revised 8-hour ozone standard of 0.075 ppm for a nonattainment designation.

The USEPA's inventory data describes "Natural Gas Systems" and "Petroleum Systems" as the two major categories of total U.S. sources of GHG gas emissions. The inventory identifies the contributions of natural gas and petroleum systems to total CO_2 and CH_4 emissions (natural gas and petroleum systems do not produce noteworthy amounts of any of the other greenhouse gases). Within the larger category of "Natural Gas Systems," the USEPA identifies emissions occurring during distinct stages of operation, including field production, processing, transmission and storage, and distribution. "Petroleum Systems" subactivities include production field operations, crude oil transportation, and crude oil refining. Within the two categories, the BLM has authority to regulate only those field production operations that are related to oil and gas measurement, and prevention of waste (via leaks, spills and unauthorized flaring and venting).

The BLM's regulatory jurisdiction over field production operations has resulted in the development of "Best Management Practices" (BMPs) designed to reduce impacts to air quality by reducing all emissions from field production and operations. Typical measures may include: flare hydrocarbon and gases at high temperatures in order to reduce emissions of incomplete combustion; require that vapor recovery systems be maintained and functional in areas where petroleum liquids are stored; placement of compressors engines 300 horsepower or less must have NOx emissions limited to 2 grams per horsepower hour; revegetate areas of the pad not required for production facilities to reduce the amount of dust from the pads; and water dirt roads during periods of high use in order to reduce fugitive dust emission. The significant threshold for particulate matter of 35 $\mu g/m^3$ daily $PM_{2.5}$ NAAQS is not expected to be exceeded under the proposed action alternative.

The USEPA data show that improved practices and technology and changing economics have reduced emissions from oil and gas exploration and development (USEPA 2008). One of the factors in this improvement is the adoption by industry of the BMPs proposed by the USEPA's Natural Gas Energy Star program. The BLM/FFO will work with industry and NMAQB to help facilitate the use of the relevant BMPs for operations proposed on federal mineral leases where such mitigation is consistent with agency policy.

4.2 Cultural Resources

One newly discovered site was identified within the survey area during the 2010 surveys.

4.2.1 Direct and Indirect Effects

Direct effects normally include alterations to the physical integrity of a cultural resource. If a cultural resource is significant for other than its scientific information, direct effects may also include the introduction of audible, atmospheric, or visual elements that are out of character for the cultural site. A potential indirect effect from the proposed action is the increase in human activity or access to the area with the increased potential of unauthorized removal or other alteration to cultural resources in the area. Based on a review of the archaeological report and the assessment of the undertaking in this area, the

BLM cultural resources staff has determined that the proposed action will have no effect on cultural resources. This determination will be included with the FFO/BLM cultural resources stipulations, if any, attached to the APD/R-O-W, as the case may be.

4.2.2 Mitigation Measures

All FFO/BLM cultural resources stipulations will be followed as indicated in the Cultural Resource Records of Review, attached to the R-O-W/APD. These stipulations may include, but are not limited to temporary or permanent fencing or other physical barriers, monitoring of earth disturbing construction, project area reduction and/or specific construction avoidance zones, and employee education.

All employees, contractors, and sub-contractors of the project will be informed by the project proponent that cultural sites are to be avoided by all personnel, personal vehicles, and company equipment, and that it is illegal to collect, damage, or disturb cultural resources, and that such activities are punishable by criminal and or administrative penalties under the provisions of the Archaeological Resources Protection Act (16 U.S.C. 470aa-mm).

In the event of a discovery during construction, the project proponent will immediately stop all construction activities in the immediate vicinity of the discovery and immediately notify the archaeological monitor, if present, or the BLM. The BLM would then evaluate or cause the site to be evaluated. Should a discovery be evaluated as significant (e.g., National Register, NAGPRA, ARPA), it will be protected in place until mitigating measures can be developed and implemented according to guidelines set by the BLM.

4.3 Native American Religious Concerns

4.3.1 Direct and Indirect Effects

The proposed action is not known to physically threaten any TCPs, prevent access to sacred sites, prevent the possession of sacred objects, or interfere or otherwise hinder the performance of traditional ceremonies and rituals pursuant to the AIRFA or EO 13007. Currently, no known remains fall within the purview of the NAGPRA or ARPA.

4.3.2 Mitigation Measures

No site-specific mitigation measures for Native American Religious Concerns have been recommended. In the event of any discoveries during project implementation, the BLM/FFO will be notified.

4.4 Environmental Justice

4.4.1 Direct and Indirect Effects

Development of the proposed action would not result in negative impacts to minority or low income populations. No minority or low income populations would be directly affected in the vicinity of the proposed action. Indirect effects could include positive effects due to overall employment opportunities

related to the oil and gas and service support industry in the region as well as the economic benefits to state and county governments related to royalty payments and severance taxes. A more detailed description of potential impacts is contained in the PRMP/FEIS (BLM 2003*a*, p. 4-120 and 4-129).

4.4.2 Mitigation Measures

No mitigation measures for Environmental Justice are recommended.

4.5 USFWS Threatened and Endangered Species

No USFWS-listed species, or potential habitats, were found in the proposed project area or vicinity.

4.5.1 Direct and Indirect Effects

The BLM/FFO reviewed and determined that the proposed action is in compliance with listed species management guidelines outlined in the September 2002 Biological Assessment (BLM 2002; Cons. No. 2-22-01-I-389). No further consultation with the USFWS is required.

4.5.2 Mitigation Measures

No mitigation measures for USFWS threatened and endangered species are recommended.

4.6 Wastes, Hazardous or Solid

Typical wastes associated with the proposed action include trash, sewage, produced water, and produced hydrocarbons. No chemicals subject to the Superfund Amendments and Reauthorization Act Title III in amounts greater than 10,000 pounds will be used during project activities. No extremely hazardous substances as defined in 40 CFR 355 in threshold planning quantities will be used.

4.6.1 Direct and Indirect Effects

The potential for littering and hazardous leaks exists during construction and operation of the proposed project. The impacts from hazardous or solid waste would be minimal to non-existent in both the short and long term with adherence to the following mitigation measures.

4.6.2 Mitigation Measures

During drilling and completion, a trash receptacle and a chemically treated portable toilet will be on location for trash and human waste disposal. All produced hydrocarbons will be put in tanks on location during completion work. Produced water will be put in onsite tanks or within a lined reserve pit during completion work. All wastes will be disposed of in a proper manner as required by federal and state law and as described in the COAs.

When significant amounts of chemicals are stored onsite, governmental agencies will be notified as required under the Emergency Planning and Community Right to Know Act (1986). The notification of releases such as natural gas, natural gas liquids, and petroleum outside the facility site is required under

the CERCLA and under BLM NTL-3A. The well location will have an informational sign (43 CFR 3160).

4.7 Water Quality, Surface and Groundwater

Key factors that influence the surface water quality in the San Juan drainage basin include some or all of the following: sparse vegetative cover, highly erosive and saline soils, rapid runoff, livestock grazing, and mineral resources development.

4.7.1 Direct and Indirect Effects

The proposed action would temporarily expose an estimated 3.94 acres of soil as a sediment source entering area drainageways. Approximately 30 percent (1.18 acres) of the area would be on previously disturbed terrain. Exposure of soils, particularly on slopes, would lead to an increase in an undetermined, but likely small, amount of sediment transport, particularly during and following storm events. The impacts to surface water quality due to short-term increases in sediment would be low as the surface water present in the project area is ephemeral. Slight alterations in project area drainage patterns may also lead to an increase in sediment transport. These increases in sediment transport would persist for several years until the disturbed areas are stabilized.

Minimal amounts of hazardous materials (i.e., gas, diesel, etc.) would be used and stored on location. There would be the potential for accidental spills or releases of these materials that could impact local water quality. Potential for surface water quality impacts from accidental spills or releases of hazardous materials would be low and long term. The impact of the proposed action on area water quality would be low in both the short and long term.

Contamination of groundwater could occur without adequate cementing and casing of the proposed well bore. With implementation of the BLM/FFO standard drilling and completion requirements, short and long term impacts to groundwater resources are anticipated to be low.

4.7.2 Mitigation Measures

Approximately 2.9 acres of the project will be reseeded with the BLM/FFO seed mix upon completion of well drilling. Burlington maintains a hazardous material response contingency plan to cover eventualities, which could arise from an accidental release of hazardous materials. The existing storm water ditch constructed for the existing well pad will be diverted from corner three to corner two for the proposed well pad. The drainage will be reestablished upon reclamation. All field activities will be suspended in the event of muddy conditions, such as vehicle travel that will create ruts eight inches or deeper. Adherence to APD COAs and other mitigation measures, such as adequate casing, cementing and other drilling and completion methods, will minimize effects to water quality.

4.8 General Topography/Surface Geology

Approximately 70 percent (2.76 acres) of the proposed San Juan 30-6 Unit #57M natural gas well pad would overlap existing disturbance. The existing well pad has been previously leveled and graded. The topography found in the undisturbed section of the proposed well pad consists of mild valley side slopes

There are no prominent topographical features such as cliffs or exposed bedrock within the proposed project area. To construct a level well pad, approximately 13 feet of cut and 11 feet of fill would be required.

4.8.1 Direct and Indirect Effects

A total of 2.76 acres of undisturbed land would be directly impacted from construction of the proposed project. Alterations to the topography from the removal of soils and rocks within the proposed project area would be low to moderate during the construction phase and low after recontouring and reseeding the periphery of the well pad. Recontouring has the potential for slightly altering drainage patterns. Impacts to the project area topography would be low and long term.

4.8.2 Mitigation Measures

Following well completion, areas not needed for operation will be re-contoured and reseeded. Once the proposed well is abandoned, Burlington would re-contour and reseed the remaining portions of the well pad in accordance with the COAs and stipulations issued by the BLM/FFO.

4.9 Paleontology Resources

The proposed project would be assessed individually based on BLM's PFYC system, known paleontological locality information and existing reports and data for the area. If preliminary analysis indicates that the proposed project falls within a Paleontology SDA or has a high probability of impacting paleontological resources, additional surveys, reporting, and stipulations would be required.

The San Jose Formation found within the proposed project area is not known to contain any paleontological resources. No fossils are known to occur within or proximate to the proposed project area.

4.9.1 Direct and Indirect Effects

Although no paleontological resources are known to occur within the proposed project area, impacts to paleontological resources from the proposed project implementation could possibly occur. Direct impacts of the proposed project to fossil localities could result from the ground-disturbing activities or the disturbance of the stratigraphic context in which they are located. This project could also create indirect impacts to areas by changing erosion patterns. An increase in human activity in the area could increase the possibility of unauthorized removal or other alterations to paleontological resources in the area. Potential impacts to paleontological resources as a result of the proposed action would be low and long term.

4.9.2 Mitigation Measures

If unknown paleontological resources are encountered at the site, all BLM/FFO paleontological resources stipulations will be followed as indicated in the COAs attached to the APD. These stipulations may include but are not limited to temporary or permanent fencing or other physical barriers, monitoring of earth disturbing construction, project area reduction and/or specific construction avoidance zones, and

employee education. Upon review, a determination for final project clearance and stipulations shall be issued by the BLM/FFO.

If previously undocumented paleontological sites are encountered during construction, all activities shall stop in the vicinity of the discovery and the BLM/FFO will be immediately notified. The site will then be evaluated. Mitigation measures such as data recovery may be required by the BLM to prevent impacts to newly identified paleontological resources.

4.10 Soils

4.10.1 Direct and Indirect Effects

The proposed action would affect approximately 3.94 acres of soils that have been classified as having a moderate to severe water erosion potential. Soils covering an estimated 1.18 acres have been previously compacted due to the construction and use of the access road. New construction would result in temporary displacement, compaction, and mixing of soils. The proposed well pad (approximately 1 acre) would remain as bare, compacted soil for the life of the project, approximately 30 years, and would be subject to an undetermined amount of wind and water erosion until the well is completely reclaimed. Compaction of the soils during construction and operation of the proposed project, coupled with the implementation of mitigation measures described below, would limit soil impacts from erosion. The most susceptible period for soil erosion impacts is during construction when strong winds or precipitation events during soil disturbing activities could mobilize soils. The impact on soils would be localized and low for the short and long term.

4.10.2 Mitigation Measures

A silt pond will be constructed on the south side of the proposed well pad to retain sediment and show water velocities. Industry related vehicle and pedestrian traffic will be restricted to proposed disturbance areas and existing roads. Following construction activities, unused areas will be reseeded with a BLM/FFO approved seed mix to stabilize soils and prevent erosion. Following construction, vehicle traffic will be restricted to existing bladed roads to prevent erosion, soil mixing, and compaction in adjacent areas. Implementation of proper soil salvage, storage, and reclamation would retain adequate infiltration and permeability rates that will allow for maintenance of soil moisture, which is necessary for plant growth and vigor, and minimize surface runoff.

4.11 Vegetation, Forestry

The vegetation within the proposed project area consists of Great Basin desert scrub with an average cover of 30 percent. The vegetation surrounding the proposed project area is comprised of primarily open desert scrub with piñon-juniper woodland on mesa top and canyon walls.

4.11.1 Direct and Indirect Effects

Direct impacts would include removal of vegetation during site clearing activities. Construction of the proposed action would result in the removal and modification of approximately 2.76 acres of previously

vegetation. Potential impacts pertain to changes in species composition and density, and an increased potential for invasive species to establish. The impact of the proposed action on area vegetation would be low and long term.

4.11.2 Mitigation Measures

During construction, Burlington and their contractors' vehicles will only operate on areas identified in this EA as work areas and on existing roadways. Revegetation of construction zones and the pipeline ROW will be initiated by Burlington immediately following construction or at the direction of the BLM. All vegetation removed during site clearing activities will be mowed and incorporated into stockpiled topsoil. The area will be reseeded with a BLM/FFO approved seed mixture shown in Table 5. All rates shown in Table 5 are for pure live seed. The amount (pounds) of seed is for drilled rate; and for broadcast applications the rate will be doubled.

Table 5. Farmington Field Office Seed Mixture

Common Name	Variety	Percent for Mix	Pure Live Seed Pounds/Acre
Western Wheatgrass	Arriba	23%	3.0
Indian Ricegrass	Paloma or Rimrock	23%	3.0
Slender Wheatgrass	San Luis	15%	2.0
Crested Wheatgrass	Hy-Crest	22%	3.0
Bottlebrush Squirreltail		15%	2.0
Four-wing Saltbush		2%	0.25

Source: BLM 2006.

Alternative Species for Consideration:

Grass: Alkali sacaton (for clayey and salty bottoms)
Needle and thread
Pubescent wheatgrass
Intermediate wheatgrass
Smooth brome (for higher elevations)

4.12 Invasive, Non-Native Species

No invasive, non-native species listed by the BLM/FFO were identified within the proposed project area.

4.12.1 Direct and Indirect Effects

Surface disturbance activities associated with the proposed project create the potential for the establishment and spread of invasive, non-native species. Invasive, non-native species can outcompete and displace native vegetation resulting in altered wildlife habitat use.

4.12.2 Mitigation Measures

Proper seeding and monitoring of the disturbed areas will reduce the potential for invasive species to spread further. Appropriate washing of vehicles entering and exiting the project area will reduce the potential for invasive and non-native plant species infestations. Adherence to BLM/FFO reclamation measures will minimize impacts from invasive, non-native species. Continued monitoring for invasive plants and appropriate control/eradication measures will be done in accordance with standard and project-specific BLM/FFO stipulations.

4.13 Special Status Species

Golden eagle, peregrine falcon, and prairie falcon have the potential to occur in the proposed project area. No BLM special management species were observed during the biological field survey. Their potential to occur within the project area is based on evaluation of the habitat, the known habitat associations of the species, and the proximity to documented nests and raptor habitat. These species have large home ranges and could potentially use the proposed project area for foraging. There is no potential nesting habitat for any special status raptor species within the proposed project area. The cliff bands in the vicinity could provide potential nesting habitat for these species. The proposed project area does not provide potential habitat for any other BLM/FFO listed special status species.

4.13.1 Direct and Indirect Effects

Direct impacts to golden eagles, peregrine falcons, and prairie falcons as a result of the proposed project would include the removal and modification of a maximum of 2.76 acres of potential foraging habitat. Approximately 1 acre would be reclaimed following construction of the proposed project. The proposed project would not result in any disturbance or modification of potential nesting habitat. Impacts would be reduced through the utilization of existing disturbance. Impacts from loss, modification and avoidance of foraging habitat would be low and long term. Raptor species may also be directly impacted during construction and drilling due to an increase in human and vehicular presence, and noise. These increases may cause raptors to temporarily avoid the area. Impacts from avoidance would be low and short term. Indirect impacts may include a change in vegetation species composition and density due to surface disturbance and reclamation, which could affect the prey base. Indirect impacts would be low and long term.

4.13.2 Mitigation Measures

Construction activities will be confined to the permitted area to avoid further disruption to all raptors. Adherence to COAs and stipulations provided by the BLM/FFO will minimize effects to all raptors that may utilize the project area and vicinity for foraging. Any spills will be promptly cleaned up and Burlington will prepare a hazardous material response contingency plan to cover eventualities that could arise from an accidental release of hazardous materials. Reserve pits will be fenced and any open cavities will be covered. Should any nesting raptors be identified before or during construction activities, the BLM/FFO biologist will be immediately contacted in order to evaluate whether additional resource protection measures are warranted.

4.14 Wildlife

4.14.1 Direct and Indirect Effects

The proposed action would result in the short-term loss of approximately 2.76 acres of undisturbed vegetation and the long-term loss of approximately 1 acre of vegetation. The shrub and grass species within the proposed project area and vicinity provides forage for big game and other wildlife species. During construction and drilling, there would be moderate, short-term impacts to area wildlife (such as deer, rabbits, and small mammals) as a result of habitat removal, human and vehicular activity and associated noise. Wildlife in the area would be displaced to adjacent habitat or may temporarily avoid the project area during construction activities. Some small, less mobile species or burrowing species could be killed during well pad construction. Impacts would be reduced through the utilization of existing disturbance. Once the project is complete, wildlife would likely return to the area. Since the vegetation removed would not necessarily be replaced with the same species, an alteration of habitat and habitat utilization is anticipated. Impacts to wildlife would be low and long term following completion, operation, and reclamation.

4.14.2 Mitigation Measures

Construction activities will be confined to the permitted area to avoid further disruption to wildlife. Re-vegetation of construction zones will be initiated by Burlington immediately following construction or at the direction of the BLM/FFO. The area will be reseeded with a BLM/FFO approved seed mixture as shown in Table 5. Noxious weed control measures will minimize the spread of weeds in the project area. Any spills will be promptly cleaned up, and Burlington will prepare a hazardous material response contingency plan to cover eventualities that could arise from an accidental release of hazardous materials. Reserve pits will be fenced and any open cavities will be covered. Adherence to BLM reclamation and sanitation measures will also minimize potential impacts to wildlife.

4.15 Migratory Birds

Effects to migratory birds can include disturbance from increased human presence, increased noise levels, temporary and permanent removal of nesting or foraging habitat, and/or destroying nests or eggs during construction if the project occurs during the breeding season.

4.15.1 Direct and Indirect Effects

Determining effects on birds is not clear-cut since activities that result in the loss of habitat for one species may improve conditions for another. Migratory bird species of concern that may occur in the project area are listed in Table 6. Scrub habitat in and surrounding the proposed project area provides a source of food, security, and escape cover and nesting substrate for migratory bird species. The proposed project would remove approximately 15 to 20 scattered piñon and juniper trees. Direct effects would include the long-term loss of 1 acre and the modification of 2.76 acres of potential nesting and foraging habitat for birds. Similarly, there may be disturbance to individuals from noise and increased human presence during construction.

Table 6. Migratory Bird Species of Concern Occurring within the BLM/FFO and Potential Impacts.

Species	Habitat Type	Effects	Impact Rating None/Low/ Moderate/High
Grasshopper sparrow (*Ammodramus savannarum*)	Sage-grass	May be positively affected due to conversion to grassland.	Low
Sage sparrow[1] (*Amphispiza belli*)	Sage-grass	Minor loss of nesting and brood rearing habitat.	Low
Burrowing owl (*Athene cunicularia*)	Sage-grass	Little effect, nests in abandoned prairie dog burrows.	Low
Ferruginous hawk (*Buteo regalis*)	Sage-grass/piñon-juniper interface	Loss of nesting and foraging habitat; decrease in prey (small mammals) abundance likely.	None
Mountain plover (*Charadrius montanus*)	Sage-grass	May be positively affected due to conversion to grassland; may produce more prey (i.e., arthropods).	None
Long-billed curlew (*Numenius americanus*)	Sage-grass	May be positively affected due to conversion to grassland.	Low
Sage thrasher[1] (*Oreoscoptes montanus*)	Sage-grass	May be some loss of sage/ nesting habitat	Low
Bendire's thrasher (*Toxostoma bendirei*)	Sage-grass	Little effect anticipated, some loss of nesting habitat; increase in prey (i.e., arthropods) likely.	Low

Note:
1 "High Priority" bird species that are listed on the NMPIF "Highest Priority" birds of conservation concern list but not on the USFWS "Birds of Conservation Concern 2008" list.

Direct effects to migratory birds would be greater should construction occur during the breeding season of April 15 through July 15. Other effects could include nest abandonment during construction in adjacent areas; degradation of habitat from invasive species introduction; and decreased mammal prey base for raptors due to loss of habitat. Short-term effects would include avoidance of the area during construction and displacement of individuals to adjacent habitats, while long-term effects would include 1 acre of potential nesting and foraging habitat converted to an industrial use. Due to the temporary nature of the construction disturbance and the availability of suitable adjacent habitat, long-term reproductive effects to migratory birds (including raptors) are not expected.

4.15.2 Mitigation Measures

Construction activities will be confined to the proposed project area to minimize surface disturbance. Adherence to BLM reclamation and sanitation measures will minimize impacts. Following construction activities, disturbed areas will be reseeded with the appropriate BLM/FFO seed mix. Noxious weed control measures will minimize the potential introduction of invasive, non-native species in the project area. Any spills will be promptly cleaned up and Burlington will prepare a hazardous material response contingency plan to cover eventualities that could arise from an accidental release of hazardous materials.

Reserve pits will be fenced and any open cavities will be covered. Any bird nests found within the proposed project area should be reported to a BLM/FFO biologist for appropriate mitigation prior to construction activities.

4.16 Grazing

The proposed action is located within the BLM/FFO grazing allotment #5059.

4.16.1 Direct and Indirect Effects

Surface disturbance associated with construction of the proposed action would remove approximately 2.76 acres of undisturbed vegetation, resulting in a minor reduction in forage and a change in the species composition. The direct short-term loss and impact to grazing is estimated to be approximately 0.1 of an AUM (at an estimated 25 acres per AUM). Following interim reclamation, long-term impacts would be the loss of about 0.04 of an AUM. Indirect effects from development and maintenance of the proposed action would be the continued presence of human activity that may disturb livestock occurring within or proximate to the project area. Depending on the time of year, cattle may occur in or near the proposed action during development and operations.

The proposed project would have low and long-term impacts to livestock grazing. Impacts to grazing are minimized by development of the proposed action on existing disturbance.

4.16.2 Mitigation Measures

Adherence to BLM reclamation and sanitation measures will minimize impacts. The BLM/FFO seed mix will be used to revegetate the proposed site disturbance. Interim reclamation will reduce the long-term impacts to approximately 0.04 of an AUM. Burlington will fence the reserve pit during construction and the produced water tank during operations, which will exclude livestock from these areas.

4.17 Recreation

4.17.1 Direct and Indirect Effects

There are no designated recreational areas within the proposed project area or immediate vicinity. The proposed project area does offer opportunities for dispersed recreational activities such as hunting. During construction and drilling, recreationists may experience an increase in traffic, fugitive dust, and sound levels, as well as night time lighting. During operation, impacts to recreationists would be low resulting from periodic increases in localized fugitive dust and noise.

4.17.2 Mitigation Measures

Suspended dust from construction will be reduced through the application of fresh water to disturbed areas and heavy vehicle traffic areas. Construction activities will be confined to the proposed project area. Mitigation measures that minimize the impact of the project include re-vegetation requirements and compatible above-ground facility paint color (juniper green) requirements that are established by the BLM.

4.18 Visual Resources

4.18.1 Direct and Indirect Effects

During construction and drilling operations, the effects of disturbed ground, machinery emissions, and the presence of the drill rig and construction equipment would result in low to moderate short term visual impacts. After construction and during operation of the proposed action, low long term visual impacts would occur, which are minimized by development of the proposed action on existing disturbance.

4.18.2 Mitigation Measures

A rapid construction schedule will minimize impacts to visual resources that result from construction and drilling activities. Mitigation measures that minimize the visual impact of the project include re-vegetation requirements above-ground facility paint color requirements that are established by the BLM/FFO.

4.19 Public Health and Safety

The proposed project may impact public health and safety in a number of ways. The primary activities associated with public health and safety is traffic and transportation to/from the site, including the handling, storage, and operation of equipment associated with construction activities. Health and safety issues for construction workers include operation of heavy equipment, welding activities, and working in the vicinity of other utilities (primarily other oil and gas gathering pipelines).

4.19.1 Direct and Indirect Effects

Direct and indirect impacts to public health and safety would be low to moderate and short term during construction and drilling. Impacts during operation would be low and long term.

4.19.2 Mitigation Measures

Adherence to company safety policies and BLM COAs will mitigate risk potential for public health and safety. In addition, hauling equipment and materials for the project on public roads will comply with all Department of Transportation (DOT) regulations. Any spills will be promptly cleaned up, and Burlington will prepare a hazardous material response contingency plan to cover eventualities that could arise from an accidental release of hazardous materials. All drilling and equipment operation will be performed in compliance with appropriate Occupation Health and Safety Administration (OSHA) regulations.

4.20 Cumulative Effects

The leased area of the proposed action has been industrialized with oil and gas well development. The surface disturbance for each project that has been permitted has created a spreading out of land use fragmentation. The cumulative impacts fluctuate with the gradual reclamation of abandoned wells and the creation of new surface disturbances in the construction of new access roads and well pads. The on-going process of restoration of abandonments and creating new disturbances for drilling new wells gradually

accumulates as the minerals are extracted from the land. Preserving as much land as possible and applying appropriate mitigation measures will alleviate the cumulative impacts.

Due to the absence of regulatory requirements to measure GHG emissions and the variability of oil and gas activities on federal minerals, it is not possible to accurately quantify potential GHG emissions in the affected areas as a result of approving this application for permit to drill. A general assumption, however, can be made: drilling this well may contribute to GHG emissions.

The lack of scientific tools designed to predict climate change on regional or local scales limits the ability to quantify potential future impacts. However, potential impacts to natural resources and plant and animal species due to climate change are likely to be varied, including those in the southwestern United States. For example, if global climate change results in a warmer and drier climate, increased particulate matter impacts could occur due to increased windblown dust from drier and less stable soils. Cool season plant species' spatial ranges are predicted to move north and to higher elevations, and extinction of endemic threatened/endangered plants may be accelerated.

Due to loss of habitat or competition from other species whose ranges may shift northward, the population of some animal species may be reduced or increased. Less snow at lower elevations would likely impact the timing and quantity of snowmelt, which, in turn, could impact water resources and species dependent on historic water conditions. Forests at higher elevations in New Mexico, for example, have been exposed to warmer and drier conditions over a 10-year period. Should the trend continue, the habitats and identified drought sensitive species in these forested areas and higher elevations may also be more affected by climate change.

5. CONSULTATION/COORDINATION

Table 7 lists individuals or organizations from the public, public land users, the interdisciplinary team, and permittees that were contacted during the development of this document.

Table 7. Summary of Contacts Made During Preparation of Document and Interdisciplinary Team.

Public Contact	Title	Organization	Present at Onsite?
Steven Merrell	Construction Supervisor	ConocoPhillips Company (COPC)	Yes
Dollie Busse	Construction Technician-Projects Development	COPC	No
Martin Deleon	Pipeline Construction Supervisor	EPCO	Yes
Mike Flaniken	Environmental Protection Specialist	BLM	Yes
Jim Copeland	Cultural Resources Specialist	BLM	No
Steve Sacks	Regulatory Specialist	Ecosphere	No
Toinette Slowman	Biologist	Ecosphere	Yes
Charles Wheeler	Archaeologists	WRCM	No

6. REFERENCES

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APPENDIX A

APPLICATION FOR PERMIT TO DRILL (APD)

APPENDIX B

CONDITIONS OF APPROVAL (COA)

APPENDIX C

BIOLOGICAL SURVEY REPORT