ENVIRONMENTAL ASSESSMENT

EA No. NM-F010-2011-86

BURLINGTON RESOURCES OIL AND GAS COMPANY, LP
SAN JUAN 28-6 UNIT #161P
PROPOSED NATURAL GAS WELL AND PIPELINE PROJECT
LEASE NUMBER NM SF-079363

Prepared for:

BUREAU OF LAND MANAGEMENT
FARMINGTON FIELD OFFICE

Prepared by:

Ecosphere
Environmental Services

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1.0 INTRODUCTION

Burlington Oil and Gas Company LP (Burlington) has proposed directionally drilling the San Juan 28-6 Unit #161P natural gas well and constructing an associated pipeline (proposed project) in Rio Arriba County, New Mexico. The legal description for the proposed project is:

Surface Location:
95' FNL (from the north line), 2,335' FWL (from the west line)
Section 13, Township 27 North, Range 06 West
New Mexico Principal Meridian (NMPM)

Bottom Hole Location:
780' FSL (from the south line), 2,350' FEL (from the east line)
Section 12, Township 27 North, Range 06 West, NMPM

Pipeline:
NE ¼ NW ¼Section 13, Township 27 North, Range 06 West, NMPM
SE ¼ of SW ¼ Section 12, Township 27 North, Range 06 West, NMPM

Surface disturbance activities associated with drilling the gas well would entail construction of a well pad and subsurface well-tie pipeline. The proposed project area is located approximately 30 miles southeast of Blanco, NM and approximately 9 miles south of U. S. Highway 64. 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, 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 lands with the surface and 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 from the valid federal mineral lease NM SF-079363 issued by the BLM in 1948 and subsequently acquired by Burlington. It is the policy of the BLM to make mineral resources available for disposal 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 holder. An approved APD, issued by the BLM, would authorize Burlington to construct the pad and drill the proposed well.

1.2 Conformance with Applicable Land Use Plan and Other Environmental Assessments

Pursuant to 40 Code of Federal Regulations (CFR) 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 as the Final Resource Management Plan 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 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 U.S. Operators are required to obtain all necessary permits and approvals for projects requiring CWA permits prior to any disturbance activities.

The New Mexico Energy, Minerals and Natural Resources Department requires oil and gas operators to follow "pit rule" guidelines contained with NMAC 19.15.17 to reduce the potential for ground water contamination from industry related activities.

The Endangered Species Act of 1973 requires all federal departments and agencies to conserve threatened and endangered 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, responsibilities 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 Council 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.

2.0 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 28-6 Unit #161P 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

Burlington has filed an APD for the proposed San Juan 28-6 Unit #161P natural gas well to access the mineral estate administered by the BLM/FFO. The legal description for the proposed project is 95' FNL and 2,335' FWL in Section 13, Township 27 North, Range 06 West, NMPM, Rio Arriba County, NM. Bottom hole footages are 780' FSL and 2,350' FEL in Section 12, Township 27 North, Range 06 West, NMPM. The proposed well-tie pipeline would be located in the NE¼ of the NW¼ of Section 13 and the SE¼ of the SW¼, of Section 12 Township 27 North, Range 06 West, NMPM. A project vicinity map is provided as Figure 1. The proposed action is shown on the Santos Peak, New Mexico U.S. Geological Survey 7.5-minute quadrangle map as Figure 2. Figure 3 shows the proposed action on the Santos Peak, New Mexico 2009 digital photo orthoquad.

The proposed action would be located within the Cereza Canyon Wildlife Area, a BLM Specially Designated Area (SDA) that is managed to protect wildlife habitat. The proposed action would also be located within the Gobernador and Cereza Canyon Fossil Area SDA that is managed to facilitate scientific study and protection of fossils.

Drilling of the proposed San Juan 28-6 Unit #161P natural gas well would require construction of a 230-foot by 300-foot pad with a 50-foot wide construction zone around the perimeter of the pad that would disturb approximately 3.03 acres. The proposed project would require a maximum 8 feet of cut and a maximum 10 feet of fill to provide a level well pad for drilling. No new road is proposed to access the proposed location as an existing dirt road bisects the proposed well pad. If the proposed natural gas well should prove productive, Williams proposes a well-tie pipeline approximately 526 feet in length constructed within a 40 foot wide ROW. The proposed well-tie pipeline would be located partially within previous disturbance associated with the existing dirt road. Approximately 139.9 feet of the proposed pipeline would be located within the proposed well pad.

Total permitted surface disturbance for the proposed project would be 3.38 acres. Approximately 0.44 acre or 15% of the proposed project area would be located on previously disturbed terrain associated with the existing road and pipeline ROW. Total new disturbance would be approximately 2.94 acres.

Construction activities associated with the proposed action would include 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 would commence following the BLM/FFO approval of Burlington's APD. In general, construction of the proposed action would follow the sequence listed below.

1. Construction crews remove vegetation from the proposed natural gas well pad. 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 a gas flare is burned during drilling to relieve wellbore pressure.
2. 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 preventers, an accumulator station, and a gas buster. Water for the drilling would be obtained from a commercial source and trucked to the site.
3. 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 or trucked 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.
4. Pipeline construction activities include: excavation of trenches, laying of pipe, covering of pipe and leveling.
5. 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.

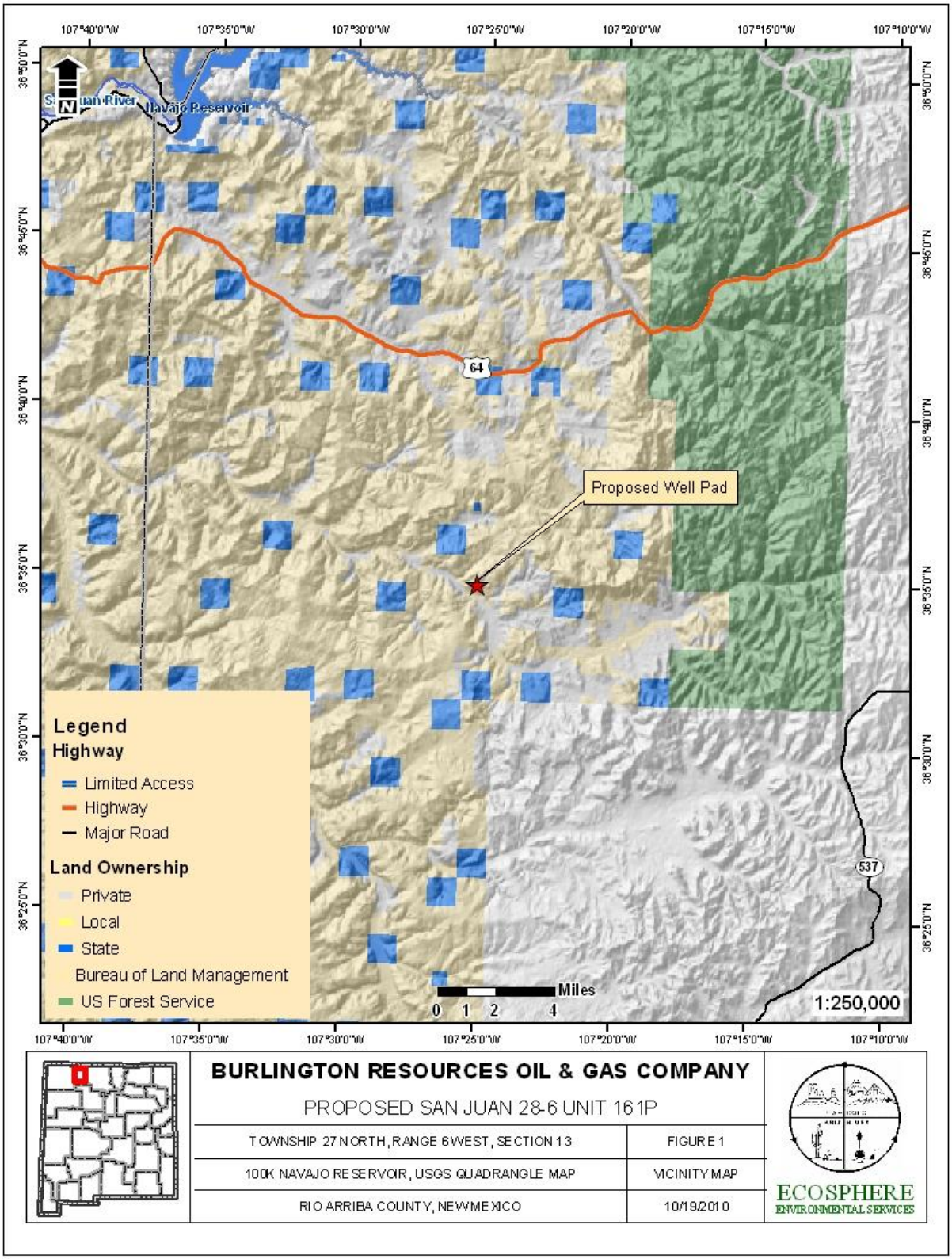
For a detailed description of design features and construction practices associated with the proposed action, refer to the project plats provided in the APD in Appendix A. Implementation of committed mitigation measures contained in the Conditions of Approval

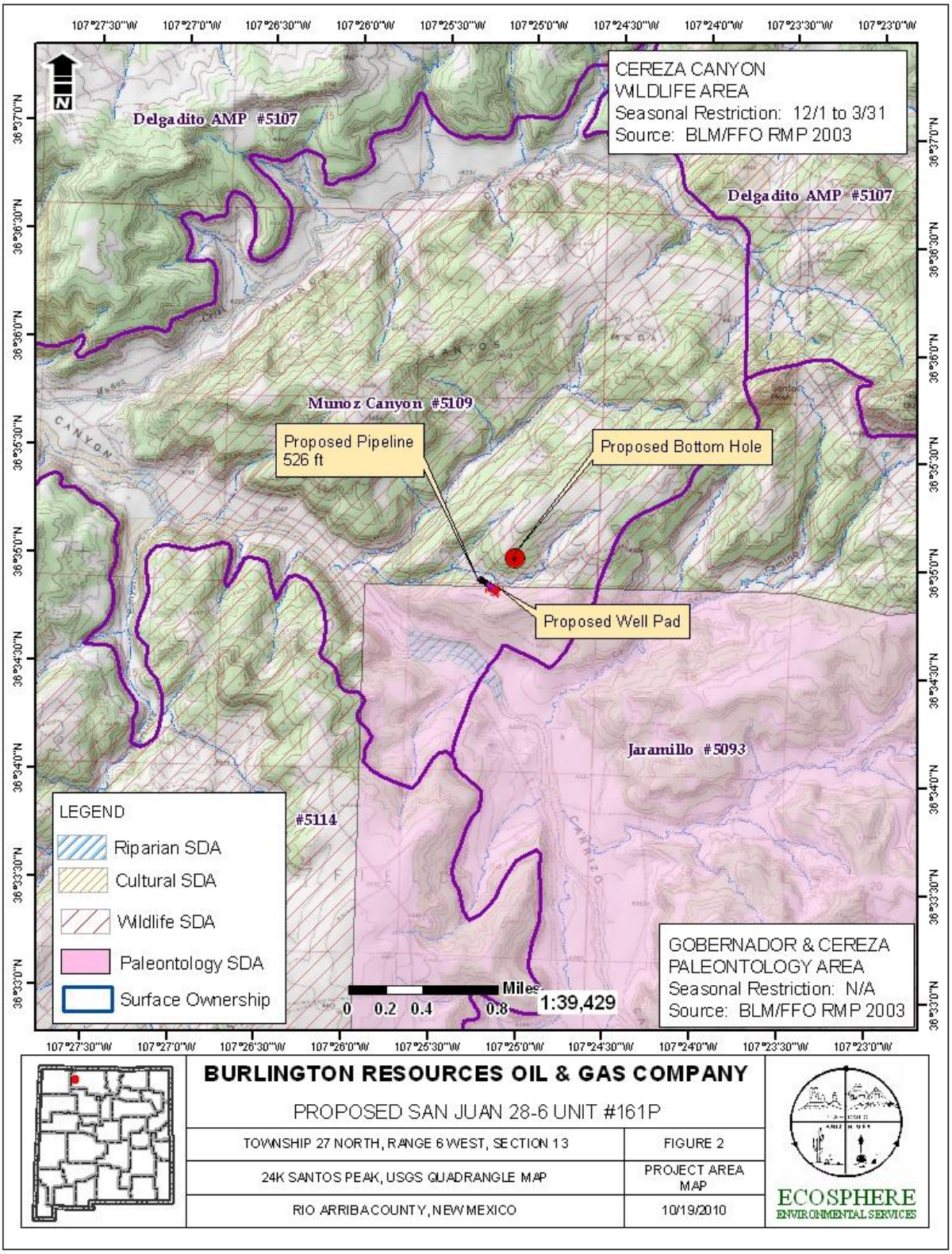
(COAs) and ROW grant stipulations are incorporated and analyzed in this alternative. The COAs and pipeline ROW grant stipulations are provided in Appendix B.

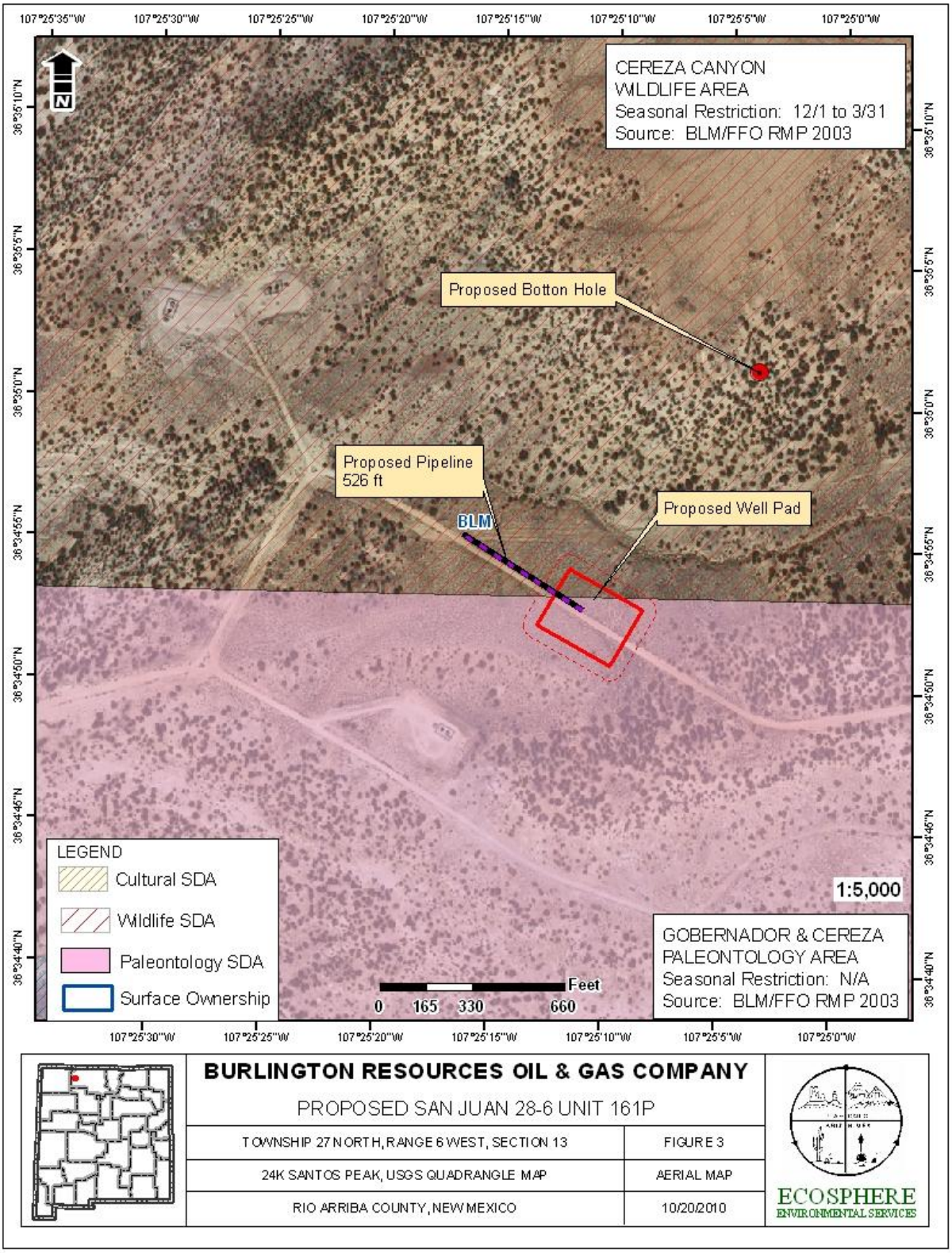
Burlington will comply with all applicable federal, state and local laws and regulations and obtain the necessary permits for the installation of the well pad and pipeline. All areas of proposed surface disturbance were inspected in the field to ensure that potential impacts to natural resources would 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

Alternatives discussed at the onsite include twinning the San Juan 28-6 Unit #161P with the existing San Juan 28-6 Unit #193. However, due to natural resource concerns there is not enough room to twin with that existing well pad. No other alternatives were identified during pre or post onsite analysis that would create less impact and still achieve the purpose and need of the proposed action.


107°40'0"W
107°35'0"W
107°30'0"W
107°25'0"W
107°20'0"W
107°15'0"W
107°10'0"W
36°50'0"N
36°45'0"N
36°40'0"N
36°35'0"N
36°30'0"N
36°25'0"N
N
Navajo Reservoir
64
537
Proposed Well Pad
Legend
Highway
Limited Access
Highway
Major Road
Land Ownership
Private
Local
State
Bureau of Land Management
US Forest Service
Miles
0 1 2 4
1:250,000
BURLINGTON RESOURCES OIL & GAS COMPANY
PROPOSED SAN JUAN 28-6 UNIT 161P
TOWNSHIP 27 NORTH, RANGE 6 WEST, SECTION 13
FIGURE 1
100K NAVAJO RESERVOIR, USGS QUADRANGLE MAP
VICINITY MAP
RIO ARRIBA COUNTY, NEW MEXICO
10/19/2010
ECOSPHERE
ENVIRONMENTAL SERVICES


CEREZA CANYON
WILDLIFE AREA
Seasonal Restriction: 12/1 to 3/31
Source: BLM/FFO RMP 2003
Delgadito AMP #5107
Delgadito AMP #5107
Munoz Canyon #5109
Proposed Pipeline
526 ft
Proposed Bottom Hole
Proposed Well Pad
Jaramillo #5093
#5114
LEGEND
Riparian SDA
Cultural SDA
Wildlife SDA
Paleontology SDA
Surface Ownership
GOBERNADOR & CEREZA
PALEONTOLOGY AREA
Seasonal Restriction: N/A
Source: BLM/FFO RMP 2003
Miles
0 0.2 0.4 0.8
1:39,429
BURLINGTON RESOURCES OIL & GAS COMPANY
PROPOSED SAN JUAN 28-6 UNIT #161P
TOWNSHIP 27 NORTH, RANGE 6 WEST, SECTION 13
FIGURE 2
24K SANTOS PEAK, USGS QUADRANGLE MAP
PROJECT AREA MAP
RIO ARRIBA COUNTY, NEW MEXICO
10/19/2010
ECOSPHERE
ENVIRONMENTAL SERVICES


CEREZA CANYON
WILDLIFE AREA
Seasonal Restriction: 12/1 to 3/31
Source: BLM/FFO RMP 2003
Proposed Botton Hole
Proposed Pipeline
526 ft
BLM
Proposed Well Pad
LEGEND
Cultural SDA
Wildlife SDA
Paleontology SDA
Surface Ownership
1:5,000
GOBERNADOR & CEREZA
PALEONTOLOGY AREA
Seasonal Restriction: N/A
Source: BLM/FFO RMP 2003
Feet
0 165 330 660
BURLINGTON RESOURCES OIL & GAS COMPANY
PROPOSED SAN JUAN 28-6 UNIT 161P
TOWNSHIP 27 NORTH, RANGE 6 WEST, SECTION 13
FIGURE 3
24K SANTOS PEAK, USGS QUADRANGLE MAP
AERIAL MAP
RIO ARRIBA COUNTY, NEW MEXICO
10/20/2010
ECOSPHERE
ENVIRONMENTAL SERVICES

3.0 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 were conducted on October 15, 2010 by an Ecosphere Environmental Services (Ecosphere) biologist and attended by representatives from Burlington, Williams and the BLM/FFO. Cultural resource surveys were conducted by La Plata Archaeological Consultants (LAC) on August 10 and 16, and September 20, 2010. Paleontology surveys were conducted on November 5, 2010 by an Ecosphere paleontologist.

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 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	**Located in Project Area**	**Not Located in Project Area**	**Further Analysis Presented in Text**	**Basis for Determination**
Air Quality	X		X	
Areas of Critical Environmental Concern (ACECs)		X		Project area is not within any BLM designated ACECs
Cultural Resources		X	X	
Native American Religious Concerns		X	X	Traditional cultural properties known to occur within 3 miles of the proposed project area (Jim Copeland, pers. comm., 10/26/10).
Environmental Justice	X		X	
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	**Located in Project Area**	**Not Located in Project Area**	**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. 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 discussed ozone in the Baseline Air Quality and Impact Assessment sections. The National Ambient Air Quality Standard (NAAQS) at the time was 0.084 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. This ruling became effective on December 18, 2006, stating that the 24-hour standard for $PM_{2.5}$, was lowered to 35 ug/m³ from the previous standard of 65 ug/m³. 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 well 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-hr 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 US Greenhouse Gas Emissions and Sinks found that in 2007, total U.S. GHG

emissions were over 7 billion metric tons and that total U.S. GHG emissions have increased by 17% from 1990 to 2007. Emissions increased from 2006 to 2007 by 1.4 percent (99.0 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 2009).

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. 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 US 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 1970's (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 28-6 Unit #161P natural gas well would be located within the Carrizo sub-watershed. Based on the Farmington PRMP/FEIS (BLM 2003a), a total of 1,588 sites representing Paleo, 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, Apache, Pueblo, Hispanic, Euro-Anglo, and General Unknown temporal/cultural components have been documented within the watershed. Of the 19 categories of sites defined based on temporal/cultural affiliation, 18 are represented. Lacking in the watershed are sites attributed to Ute occupations. The most frequently occurring cultural affiliations recorded are Dinétah/Gobernador (38%) and Anasazi period components (21%). Site density is high with any apparent gaps most likely a factor of lacking inventory and not a lack of sites.

La Plata Archeological Consultants conducted cultural resources surveys of the proposed project under the New Mexico Cultural Resource Permit number 19-2920-08-Y on August 10 and 16, and September 20, 2010. La Plata Archeological Consultants surveyed the proposed well pad, construction zone and the proposed pipeline for a total of 8.1 acres. Prior to field surveys of the project area, an investigation of records at the BLM/FFO and an online search of Archeological Records Management Section (ARMS) to determine if any sites had been recorded within 0.25 mile of the survey area. A search of the National Register of Historic Places (NRHP) and State Register of Cultural Properties was conducted, and Van Valkenburgh (1974) was consulted. There are no previously recorded sites within 0.25 mile of the project area. The cultural resources report (LAC 2020-12c) has been submitted to the BLM/FFO under separate cover.

3.1.3 Native American Religious Concerns

There are several pieces of legislation and executive orders that are considered in an evaluation of Native American Religious Concerns [i.e., American Indian Religious Freedom Act (AIRFA) of 1978, Executive Order 13007, The Native American Graves Protection and Repatriation Act (NAGPRA) of 1990, and the Archaeological Resources Protection Act (ARPA) of 1979].

Traditional Cultural Properties (TCPs) are a separate class of cultural resources that may occur in the EA analysis area, may or may not coincide with archaeological sites and artifact loci, and may fall under the purview of one or more of the cited legislation. 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. (National Register Bulletin 38)

For the proposed action, identification efforts for Native American Religious Concerns were limited to reviewing existing published and unpublished literature and personal communications with Jim Copeland, BLM/FFO archaeologist. The proposed project area would not be located within any TCP (Jim Copeland, BLM/FFO, pers. comm., October 26, 2010). However, the proposed project would be located within three miles of a TCP, Dizdze Nteeli or Dzide Hoteel which is associated with Tuckers Ridge.

3.1.4 Environmental Justice

Executive Order 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 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 which 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 (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), (P) Proposed Threatened, or Candidate (C) Species with Potential to Occur in Rio Arriba County, New Mexico (USFWS 2010).

SPECIES	STATUS	HABITAT ASSOCIATIONS	PRESENCE[1]
MAMMALS			
Black-footed ferret (*Mustela nigripes*)	E	Open grasslands with year-round prairie dog colonies of 200 acres or greater.	NP
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			
Mexican spotted owl (*Strix occidentalis lucida*)	T	Nests in caves, cliffs, or trees in steep-walled canyons of mixed conifer forests.	NP

SPECIES	STATUS	HABITAT ASSOCIATIONS	PRESENCE[1]
Southwestern willow flycatcher (*Empidonax traillii extimus*)	E	Breeds in dense, shrubby riparian habitats, usually in close proximity to surface water or saturated soil.	NP
Yellow-billed cuckoo (*Coccyzus americanus ssp. occidentalis*)	C	Breeds in riparian woodlands with dense, understory vegetation.	NP
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
Mountain plover (*Charadrius montanus*)	P	Breeds in extremely dry, level shrublands, shortgrass prairie, barren agricultural fields, and other sparsely vegetated areas	NP
FISH			
Rio Grande cutthroat trout (*Oncorhynchus clarkii virginalis*)	C	Prefers clear mountain streams or lakes with large substrate in the Rio Grande watershed.	NP
Rio Grande silvery minnow (*Hybognathus amarus*)	E	Prefers large streams with slow to moderate currents over a mud, sand or gravel bottom.	NP
AMPHIBIANS			
Jemez Mountains salamander (*Plethodon neomexicanus*)	C	Inhabits mixed conifer forest consisting primarily of Douglas fir (*Pseudotsuga menziesii*), blue spruce (*Picea pungens*), Engelman spruce (*P. engelmannii*), white fir (*Abies concolor*), and aspen (*Populus tremuloides*).	NP

[1]**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.

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

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 is (1) is listed by the USEPA as a hazardous waste, (2) exhibits any of the characteristics of hazardous wastes (ignitability, corrosivity, 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 CBM gas. 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 ED&P 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 proposed project area would be located in the Upper Colorado River Hydrologic Region and is part of the Carrizo sub-watershed. An unnamed, ephemeral drainage is located about 100 feet north of the project area. A drainage, approximately 3-6 feet wide by 2-6 feet deep, flows from the center of the proposed well pad to the unnamed wash north of the well pad. The general drainage of the proposed project area flows southeast to northwest into the nearby unnamed drainage and into Carrizo Canyon, located approximately 0.3 mile west. The BLM designated Ephemeral Wash Riparian Cereza Canyon Reach #6 is located approximately 1,500 feet southwest of the proposed action. A cattle pond is located approximately 200 foot northwest of the proposed project area. 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. The database has no records of water wells located with the proposed project area or a 1-mile radius.

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	Located in Project Area	Not Located in Project Area	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	

3.2.1 General Topography/Surface Geology

The proposed project would be located about 0.5 mile east of Carrizo Canyon, approximately 9 miles south of U.S. Highway 65, and 1.20 miles southwest of Santos Peak. The mesa north of the proposed project area rises approximately 150 feet from its surrounding terrain and is composed of terraced cliffs ranging from about 30-40 feet in height. There are no prominent topographical features within the proposed well pad or pipeline ROW. Elevation of the proposed project area is approximately 6,503 feet. The project area gently slopes (3-5 degrees) with a east-northeast aspect. Surface geology of the proposed project area is derived from 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 conventional 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 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).

The proposed project area is also located within the Gobernador and Cereza Canyon Fossil Area. There are approximately 27,647 acres within the Gobernador and Cereza Canyon Fossil Area which are managed to facilitate scientific study and protection of paleontological resources.

A paleontological survey was conducted on November 6, 2010 by Ecosphere and is provided as Attachment D. No vertebrate fossils were discovered along any section of the area proposed to be disturbed during the survey. Due to the soil cover, fossils would only occur in the subsurface and would be unidentifiable or irretrievable. The nearest outcrop is of substantial distance from the project and separated by an arroyo, and therefore will not transport fossils to the proposed project area

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.

The undisturbed portion of the proposed project area contains tan, sandy loam soils while the disturbed portion of the project area is more compacted due to the existing road. The proposed project area contains one major soil mapping unit, Orlie fine sandy loam, 1 to 8% slopes (USDA/NRCS 2007).

Orlie fine sandy loam is found on 1 to 8% slopes in valley sides and mesa tops. This soil ranges from well drained to somewhat excessively drained valley sides and hillsides. The parent material primarily consists of alluvium and eolian material derived from sandstone and shale. This soil has a deep structure (greater than 60 inches to underlying rock), which is moderately permeable. Available water capacity is very high with a moderate shrink-swell potential. This soil is moderately susceptible to water erosion. The major use of this soil type is livestock grazing. The potential plant community is characterized by western wheatgrass (*Agropyron smithii*), Indian ricegrass (*Achnatherum hymenoides*), needle and thread (*Hesperostipa comata*), galleta (*Pleuraphis jamesii*), and big sagebrush (*Artemisia tridentata*).

3.2.5 Vegetation, Forestry

The majority of the proposed project would be located within an undisturbed sagebrush shrubland surrounded by piñon-juniper (*Pinus edulis-Juniperus osteosperma*) woodland. The project area is dominated by big sagebrush. Dominant understory vegetation consists of sand dropseed (*Sporobolus cryptandrus*), James galleta and blue grama (*Bouteloua gracilis*). Approximately 20 immature to mature trees are located within the eastern portion of the proposed well pad. The existing road is bare and compacted. The overall vegetative cover was

visually estimated at up to 80%. A complete list of plants found during the field survey is included in the BSR in Appendix C.

3.2.6 Invasive, Non-native Species

The BLM/FFO maintains a list of invasive, non-native plant species of concern (BLM 2003*a*). No BLM/FFO listed invasive, non-native plant species of concern were identified in the proposed project area during the field survey.

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*) and prairie falcons *(Falco mexicanus)*. The cliff faces approximately 10 miles northwest of the project area, associated with Carrizo Canyon, provide potential nesting substrate for these raptors, and are designated as raptor habitat by the BLM/FFO. The proposed project area does not contain potential raptor nesting habitat. According to the BLM/FFO, there are six historical or active golden eagle *(Aquila chrysaetos)* nests within approximately six miles of the proposed well pad (BLM 2009, unpublished data). 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. Trees and snags within the general vicinity of the proposed project area offer potential raptor perch sites.

The proposed project area does not contain potential habitat for any other BLM/FFO special status species.

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+ ft high), adjacent to rivers, lakes, or streams. Urban areas with towers and buildings are also inhabited.	NP
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 ft).	NP
Brack's hardwall cactus (*Sclerocactus cloveriae ssp. brackii*)	Sandy clay of the Nacimiento Formation in sparse shadscale scrub (5,000-6,000 ft).	NP

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 coyote (*Canis latrans*) cottontail *(Sylvilagus audubonii)*, black-tailed jackrabbit *(Lepus californicus)*, mule deer *(Odocoileus hemionus)*, and elk (*Cervus canadensis*), and. According to the BLM (2008, unpublished data), and confirmed during the field survey, no prairie dog *(Cynomys sp.)* burrows were observed within the project area. However, a historic or recently active prairie dog colony is located within 1.5 miles southwest of the proposed project area. A list of wildlife species observed within the proposed project area is provided in the project BSR in Appendix C.

The proposed project area is located within the 45,266-acre Cereza Canyon Wildlife Area. The Cereza Canyon Wildlife area is managed to protect wildlife habitat, as the area is an important winter range for deer and elk.

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 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 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 scrub (sage/grass). Some of the birds listed as "Highest Priority" by the PIF group as well as USFWS "Birds of Conservation Concern" include gray vireo (*Vireo vicinior*), gray flycatcher (*Empidonax wrightii)*, sage sparrow (*Amphispiza belli*), and sage thrasher (*Oreoscoptes montanus)*. The USFWS list of "Birds of Conservation Concern" includes the gray vireo and sage sparrow.

The Bird Conservation Plan developed for the State of New Mexico by PIF lists the sage thrasher (*Oreoscoptes montanus*) and sage sparrow within the Great Basin desert scrub habitat type as "highest priority" species for conservation. The ferruginous hawk (*Buteo regalis*), 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 surrounding the project action 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 surrounding 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 grassland 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 FFO/BLM 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 Section 15 authorizations permit grazing on 30 allotments in the Lindrith, NM area.

The proposed project is located within BLM grazing allotment #5109 (Munoz Canyon). Allotment #5109 is permitted for 126 cattle March 1 through May 1 for a total of 177 animal unit months (AUM). The allotment is also permitted for 126 cattle October 1 through February 28 for a total of 432 AUM.

3.2.11 Recreation

The proposed project area is not within a designated recreational area. It does, however, provide for dispersed recreation activities such as hunting, hiking, bird and wildlife watching, and products gathering.

3.2.12 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 project area is located on undisturbed terrain. The vicinity of the project area consists of primarily desert grassland interspersed with piñon-juniper woodland habitat.

The BLM has developed a Visual Resource Management (VRM) classification system designed to maintain or enhance visual qualities and describe the different degrees of modification to the landscape (BLM 2003a). 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. 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. This classification provides for management activities which require major modification of the existing character of the landscape. Activities may attract attention, may dominate the view, but are still mitigated (BLM 2003a).

3.2.13 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.

4.0 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 CEQ guidelines (40 CFR 1500-1508), impacts which are substantial in severity and therefore should receive the greatest attention in decision making.
>
> **Moderate** - impacts which cause a degree of change that is easy to detect, but do not meet the criteria for significant impacts.
>
> **Low** - impacts which 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. 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

Under the proposed action, the San Juan 28-6 Unit #161P well pad and pipeline would be constructed and the well would be drilled as proposed, with mitigation measures to reduce potential impacts to environmental resources. Total surface disturbance associated with the proposed project would be 3.38 acres. The proposed well-tie pipeline ROW would be partially located within proposed well pad and parallel to an existing dirt road. Approximately 1 acre would be subject to long-term disturbance associated with the natural gas well and access. 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

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 access road, well pad, and by the drilling rig that will be used to drill the well. Dust dissemination would discontinue upon completion of the construction phase of the access road and well pad. 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, dust from recreational use, and dust from use of roads for vehicular traffic.

Over the last 10 years, the leasing of federal oil and gas mineral estate in the 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, NOx and 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 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 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 PSD Class I Areas (Mesa Verde National Park and the

Weminuche Wilderness Area) could occur at some unspecified time in the future

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's planning and NEPA documents as appropriate.

4.1.2 Mitigation Measures

The FFO has been a participant of the Four Corners Air Quality Task Force (FCAQTF) since its inception back 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, which 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 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 FFO has complied with this directive through a condition of approval (COA) which 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 FFO PRMP/FEIS. 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 US 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 ug/m³ 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 (Inventory of US Greenhouse Gas Emissions and Sinks: 1990-2006). 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 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

No cultural resources were identified within the proposed project area. The cultural resources report has been submitted to the BLM under separate report cover LAC 2010-12c.

4.2.1 Direct and Indirect Effects

No direct impacts to cultural resources would be expected. A potential indirect effect from the proposed action is the increase in human activity in the area with the increased possibility of unauthorized removal or other alteration to cultural resources, if any found in the area. A cultural resources determination of effect for the proposed action would be issued by BLM/ FFO archaeologists. This determination would be included in the BLM/FFO cultural resources stipulations attached to the APD.

4.2.2 Mitigation Measures

No site specific mitigation measures have been recommended for the proposed action. If previously undocumented cultural sites are encountered during construction, all activities will stop in the vicinity of the discovery and the BLM will be immediately notified. The site would then be evaluated. Mitigation measures such as data recovery may be required by the BLM to prevent impacts to newly identified cultural resources.

4.3 Native American Religious Concerns

The proposed action is not known to physically threaten any TCP's, 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 American Indian Religious Freedom Act or EO13007. Currently, no known remains fall within the purview of the Native American Graves Protection and Repatriation Act or the Archaeological Resources Protection Act. Dizdze Nteeli or Dzide Hoteel Religious site is however located within 3 miles of the proposed project area.

4.3.1 Direct and Indirect Effects

Although none have been identified within the proposed project area, any heretofore-unidentified effects of the proposed action to Native American Religious Concerns, direct and indirect, are expected to be low and long term.

4.3.2 Mitigation

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

4.5.1 Direct and Indirect Effects

FFO reviewed and determined that the proposed action is in compliance with listed species management guidelines outlined in the September 2002 Biological Assessment (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 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.

4.6.1 Direct and Indirect Effects

The proposed action would temporarily expose an estimated 3.38 acres of soil as a sediment source entering area drainage ways. Vegetation cover is moderate throughout the project area. Exposure of soils, particularly near the washes and 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 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 which 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 ground water 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.

4.6.2 Mitigation Measures

Approximately 2 acres of the project will be re-seeded with the BLM/FFO seed mix upon well completion. Burlington maintains a hazardous material response contingency plan to cover eventualities, which could arise from an accidental release of hazardous materials. All field activities will be suspended in the event of muddy conditions, such that vehicle travel will be creating ruts. 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. A 24-inch culvert will be installed where the road enters the pad. A silt trap will be constructed

within the construction zone to collect stormwater and trap excess sediments from flowing off site.

4.7 General Topography

4.7.1 Direct and Indirect Effects

A total of 3.38 acres of land would be directly impacted from construction of the proposed project. To provide a level well pad there would be a maximum 8 feet of cut and 10 feet of fill. Alterations to current topography would be low to moderate due to amount of undisturbed area and the amount of cut and fill. Impacts to topography would be noticeable. Impacts to the project area topography would be low to moderate and long-term during operation. Following abandonment, impacts to topography would be low and long-term.

4.7.2 Mitigation Measures

Following well completion, areas not needed for operation will be recontoured and reseeded. Once the proposed well is abandoned, Burlington will recontour and reseed the remaining portions of the well pad in accordance with the COAs and stipulations issued by the BLM.

4.8 Paleontology Resources

The proposed project area is also located within the Gobernador and Cereza Canyon Fossil Area. The proposed project would be assessed individually based on BLM's PFYC system, known paleontological locality information, existing reports and data for the area. If preliminary analysis indicates that the proposed project falls within a Paleontology Specially Designated Area (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 were identified in the proposed project area. The paleontology report is provided in Appendix D.

4.8.1 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.

4.8.2 Mitigation Measures

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. A paleontological clearance is required prior to surface-disturbing activities for the proposed action.

If previously undocumented paleontological sites are encountered during construction, all activities shall stop in the vicinity of the discovery and the BLM 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.

4.9 Soils

4.9.1 Direct and Indirect Effects

The proposed action would affect approximately 3.38 acres of soils resulting in temporary displacement, compaction, and mixing of soils. Soils in the area have been characterized as having moderate to severe water erosion potential and a moderately high wind erosion potential. The well pad and access (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 pad 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.

4.9.2 Mitigation Measures

Industry related vehicle and pedestrian traffic will be restricted to proposed disturbance areas and existing roads. The top six inches of topsoil will be stockpiled and then respread during reclamation. Following construction activities, unused areas will be reseeded with a BLM 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 will 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.

4.10 Vegetation, Forestry

4.10.1 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 2.94 acres

of undisturbed and 0.44 acres of previously disturbed vegetation. Approximately 20 piñon or juniper trees would be removed. Approximately 1 acre of sagebrush grassland would be removed resulting in low long-term impacts. 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.

4.10.2 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 will be initiated by Burlington immediately following completion or at the direction of the BLM. Trees removed during site clearing activities will be chipped and mowed into topsoil at reclamation. The area will be reseeded with a BLM approved seed mixture shown in Table 5. All rates shown in Table 5 are for pure live seed (PLS). The amount of seed is for drilled rate, for broadcast applications the rate will be doubled.

Table 5: Farmington Field Office Seed Mixture.

Common Name	Variety	Percent for Mix	Pure Live Seed Lbs/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)

4.11 Invasive, Non-native Species

No invasive, non-native species listed by the BLM/FFO were identified in the proposed project area during the biological surveys.

4.11.1 Direct and Indirect Effects

Surface disturbance activities associated with the proposed project may create the potential for introducing noxious weeds and invasive, non-native species. The proposed project would have low and long-term impact from the potential introduction and establishment of invasive, non-native species into the area.

4.11.2 Mitigation Measures

Proper seeding and monitoring of the disturbed areas will reduce the potential for invasive species to occur. Appropriate washing of vehicles entering and exiting the project area will reduce the potential for invasive, non-native plant species infestations. Adherence to BLM 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 stipulations.

4.12 Grazing Resources

4.12.1 Direct and Indirect Effects

Surface disturbance associated with construction of the proposed action would remove approximately 2.94 acres of undisturbed vegetation and 0.44 acres of previously disturbed vegetation, resulting in a minor reduction in forage and a change in the herbaceous species composition. The direct short-term loss and impact to grazing is estimated to be approximately 0.3 of an AUM (at an estimated 25 acres per AUM). Following interim reclamation, long-term impacts would be the loss of about 0.1 of an AUM. Indirect effects from development and maintenance of the proposed action would be the continued presence of human activity which 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.

4.12.2 Mitigation Measures

The BLM/FFO seed mix will be used to revegetate the proposed site disturbance. Approximately 2.38 acres of vegetation will be reclaimed after drilling of the proposed well pad. Burlington will fence around the reserve pit during construction and the produced water tank during operations, which will preclude livestock from utilizing produced water.

4.13 Special Status Species

Golden eagle and prairie falcon have the potential to occur in the proposed project area or surroundings. These BLM special management species were not observed during the field survey in October 2010. 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.

4.13.1 Direct and Indirect Effects

Direct impacts to golden eagles and prairie falcons as a result of the proposed project, would include the removal and modification of a maximum of 3.38 acres of potential foraging for these raptor species. Approximately 2.38 acres would be reclaimed following construction of the

proposed project. The proposed project would not result in any disturbance or modification of potential nesting habitat. The loss approximately 20 trees would result in reduced perching habitat for raptor species, though many of these trees are immature. This reduction is not expected to result in reduced foraging effectiveness given the amount of perching habitat in the surrounding area. Impacts from loss or modification of foraging habitat would be low and long-term. Direct short-term impacts to these raptor species would include temporary avoidance during construction and drilling due to increased noise, and human and vehicular presence. Indirect impacts may include a change in vegetation species composition and density due to surface disturbance and reclamation, which could affect the prey base for golden eagles. 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 will minimize effects to all raptors that may utilize the project area and vicinity for foraging. Should any nesting raptors be identified before or during construction activities, the BLM biologist will be immediately contacted in order to evaluate whether additional resource protection measures are warranted.

4.14 Wildlife

The proposed project area is located within the 45,266-acre Cereza Canyon Wildlife Area. The Cereza Canyon Wildlife area is managed to protect wildlife habitat, as the area an important winter range for deer and elk.

4.14.1 Direct and Indirect Effects

Construction of the proposed action would result in the temporary loss of approximately 2.38 acres of vegetation. Approximately 1 acre of vegetation would be lost over the long-term. The shrub and grass species within the proposed project area and vicinity provides forage for big game and other wildlife species. During construction activities and drilling there would be low to moderate, short-term impacts to area wildlife (such as deer, rabbits, and small mammals) as a result of habitat removal, and human and vehicular activity and associated noise. Some small less mobile wildlife or burrowing animals could be killed during construction of the well pad. Wildlife in the area would be displaced or may temporarily avoid the project area during construction activities. 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 and in the same percentage, an short-term alteration of habitat and habitat utilization is anticipated in those areas reclaimed. Impacts to wildlife would be low and long-term following reclamation.

4.14.2 Mitigation Measures

There is a seasonal restriction on construction and drilling from December 1 through March 31 within the Cereza Canyon Wildlife Area. Construction activities will be confined to the permitted area to avoid further disruption to wildlife. Revegetation of construction zones will be initiated by Burlington immediately following construction or at the direction of the BLM. The

area will be reseeded with a BLM approved seed mixture as shown in Table 5. Adherence to BLM reclamation and sanitation measures will also minimize potential impacts to wildlife.

4.15 Migratory Birds

Effects to migratory birds would include disturbance from increased human presence, increased noise levels, temporary and permanent removal of nesting or foraging habitat, or destroying individual nests or eggs during habitat removal 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. Habitat provides a source of food, security and escape cover, and nesting habitat for migratory bird species. Direct effects would include the loss of 1 acre and the modification of 2.38 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 lists the migratory bird species of concern potentially occurring in the proposed project area and impacts.

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

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. 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, 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 seed mix. 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. 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 Recreation

4.16.1 Direct and Indirect Effects

The general area offers dispersed recreational opportunities for hunters, hikers and wildlife watchers. 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 and long-term.

4.16.2 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 revegetation requirements, sound panels, low profile equipment and above-ground facility paint color (juniper green) that are established by the BLM.

4.17 Visual Resources

4.17.1 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 moderate short-term visual impacts. After construction and during operation of the proposed action, low long-term visual impacts.

4.17.2 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 revegetation requirements, low-profile equipment and above-ground facility paint color.

4.18 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).

4.18.1 Direct and Indirect Effects

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

4.18.2 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 regulations. Any spills will be promptly cleaned up and Burlington will prepare a hazardous material response contingency plan to cover eventualities, which 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.

4.19 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 well abandonments and the creation of new additional 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 dependant on historic water conditions. Forests at higher elevations in NM, for example, have been exposed to warmer and drier conditions over a ten 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.

5.0 CONSULTATION/COORDINATION

This section includes 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 public contacts made during preparation of document and the interdisciplinary team.

Public Contact	Title	Organization	Present at Onsite?
Steven Merrell	Construction Supervisor	ConocoPhillips	Yes
Brandie Blakley	Construction Technician-Projects Development	ConocoPhillips	No
Vickie Estlack	Pipeline Construction Supervisor	Williams Four Corners	Yes
Mike Flaniken	Environmental Protection Specialist	Bureau of Land Management	Yes
Jim Copeland	Cultural Resources Specialist	Bureau of Land Management	No
Steven Fuller	Archaeologist	La Plata Archeological Consultants	No
John H. Burris	Paleontologist	Ecosphere Environmental Services	No
Amanda Stenjem/Toinette Slowman	Biologists	Ecosphere Environmental Services	Yes

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APPENDIX A

APPLICATION FOR PERMIT TO DRILL (APD)

APPENDIX B

CONDITIONS OF APPROVAL (COA)

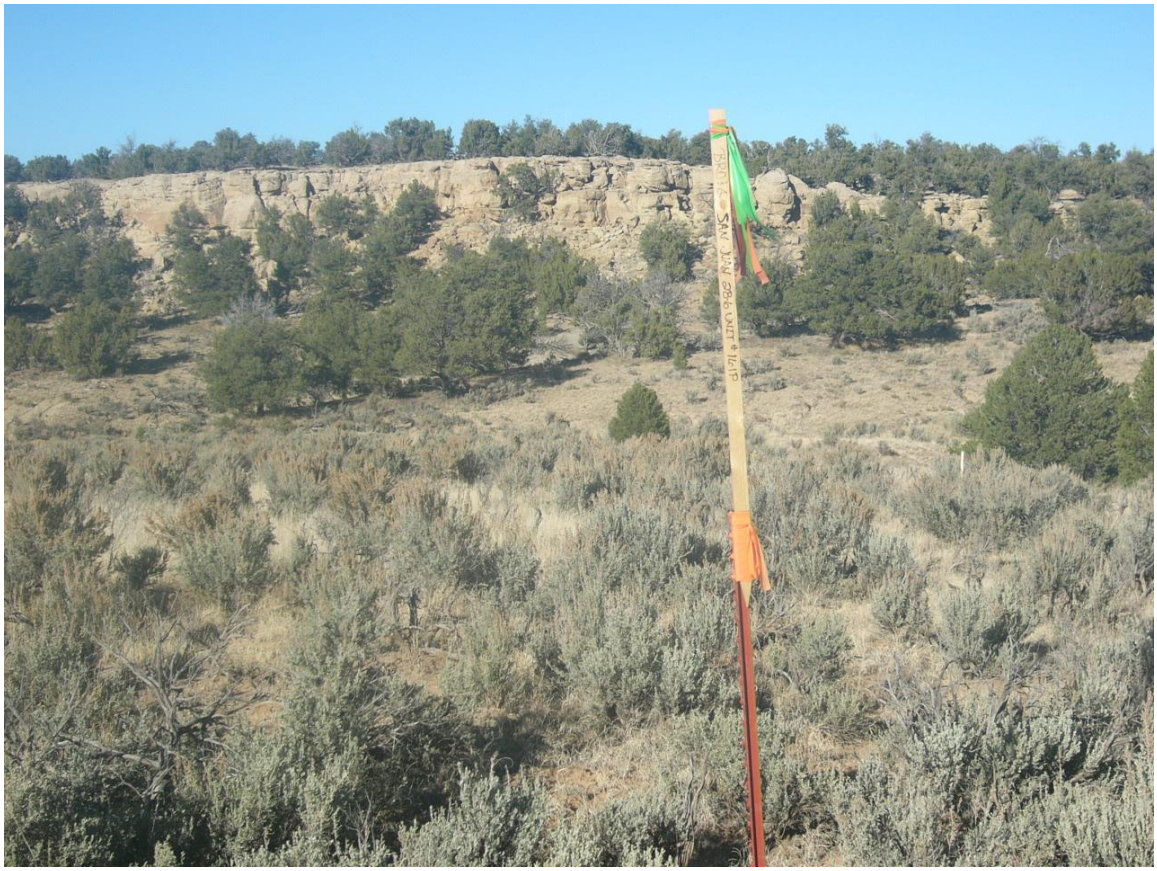
APPENDIX C

BIOLOGICAL SURVEY REPORT

APPENDIX D
PALEONTOLOGICAL REPORT

Report of Survey Findings
Burlington Resources Oil & Gas Company LP
San Juan 28-6 Unit #161P Well Pad and Pipeline Project
Section 13 T27N, R6W
Rio Arriba County, New Mexico

For Bureau of Land
Management Farmington Field Office (BLM/FFO)



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November 6, 2010

Introduction

Burlington Resources Oil & Gas Company LP is proposing construction of a new well pad and pipeline for retrieval and transportation of natural gas. This project consists of 3.03 acres of disturbance for the pad and 525.8 feet of pipeline on lands with mineral rights administered by the Bureau of Land Management Farmington Field Office (BLM/FFO). The location is in the Gobernador and Cereza Fossil Area and has potential paleontological significance, and therefore surveying for paleontology was required. Rock units at the study site belong to the early Tertiary San Jose Formation and have produced important vertebrate, invertebrate, and plant fossils (Lucas, 1977).

Location

The well location is approximately 8.5 miles west of the Carson National Forest. The study area is on land with mineral rights administered by the BLM/FFO. A paleontological survey was required by the BLM/FFO on land under their jurisdiction consisting of one day of field work on November 5, 2010.

Location of San Juan 28-6 Unit #161P Well Pad and Pipeline Project:
NE ¼, NW ¼, Section 13, T27N, R6W
N36˚ 34.878', W107˚25.177' NAD 83

Geology

The entire proposed project is located on modern floodplain composed of silty recent soils covered with sagebrush, juniper, and pinion. (**Figures 1, 2**). The nearest outcrop of San Jose Formation is about 500' to the north, across an arroyo (**Figure 3**).

Paleontological Monitoring Methodology

On the date listed above John Burris, Paleontologist for Ecosphere Environmental Services, prospected the perimeter of the well-pad and area within, and the entire length of proposed pipeline.

A GPS unit and digital camera were used to record the survey.

Paleontological Survey Results – Negative Report

The paleontological survey yielded a negative report. No vertebrate fossils were discovered along any section of the area proposed to be disturbed. Due to the soil cover, fossils would only occur in the subsurface and would be unidentifiable or irretrievable. The nearest outcrop is of significant distance and separated by an arroyo, and therefore will not transport fossils to the proposed project area. The proposed well pad and pipeline should not disturb any scientifically valuable fossils.

References Cited:

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Figures

Figure 1 – Overview of proposed well pad, showing lack of outcrop, area covered by sagebrush. View is to the northwest.

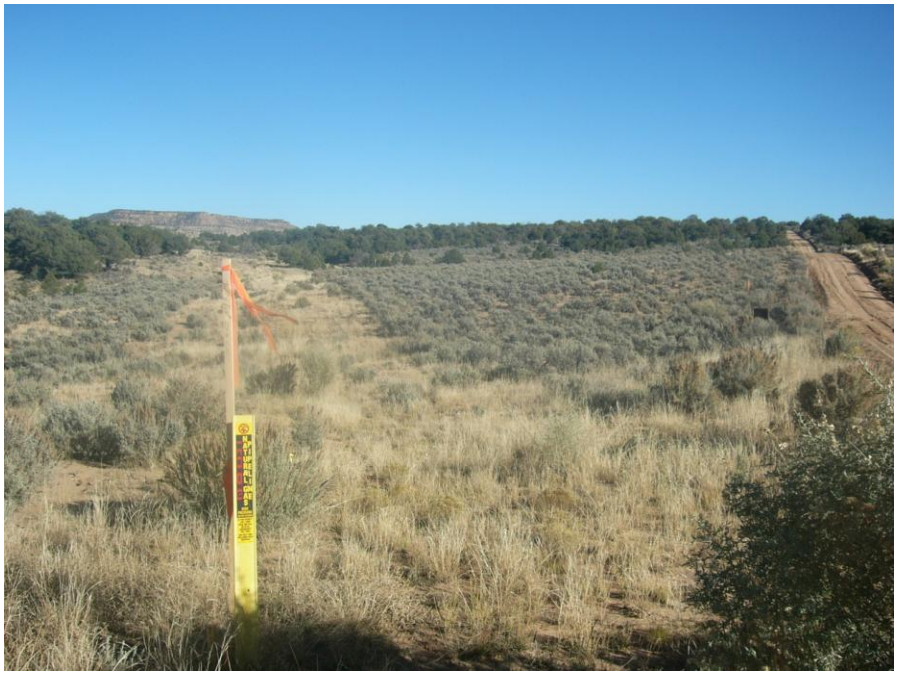

Figure 2 – Overview of proposed well pad and pipeline, showing lack of outcrop, area covered by sagebrush. View is to the east.

Figure 3 – View to the north, showing nearest sandstone outcrop.