BUREAU OF LAND MANAGEMENT
FARMINGTON FIELD OFFICE

ENVIRONMENTAL ASSESSMENT

FOR

Application for Permit to Drill the
XTO Energy Inc. Stanolind
Gas Com B 5H Well Pad

Lease# NMNM 0019414
NM- F010- 2011- 48
November 2010

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1.0 Introduction

A representative of XTO Energy Inc. (XTO) filed an Application for a Permit to Drill (APD) with the BLM for the well pad Stanolind Gas ComB 5H. The project is located in the SESE/4 of Section 9, Township 32N, Range 12W, in San Juan County, New Mexico.

This site-specific analysis tiers into and incorporates by reference the information and analysis contained in the Farmington Proposed Resource Management Plan Final Environmental Impact Statement (PRMP/FEIS). This project EA addresses site-specific resources and/or impacts that are not specifically covered within the PRMP/FEIS, as required by the National Environmental Policy Act of 1969 (NEPA), as amended (Public Law 91-90, 42 U.S.C. 4321 et seq.).

1.1 Purpose and Need

The purpose for the proposal is to define and produce natural gas on one or more valid federal oil and gas mineral leases issued to the applicant by the BLM. 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 (MLA), as amended [30 USC 181 et seq.], authorizes the BLM to issue oil and gas leases for the exploration of oil and gas 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 Application for Permit to Drill (APD), issued by the BLM, authorizes the applicant to construct and drill the proposed well.

The Stanolind Gas Com B 5H gas well allows XTO Energy Inc. to develop their lease and provide additional natural gas for the national energy market, which also generates federal and state tax revenue as well as revenue for XTO Energy Inc..

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 site-specific environmental assessment (EA) tiers to and incorporates by reference the information and analysis contained in the Farmington Proposed Resource Management Plan/Final Environmental Impact Statement [(PRMP/FEIS) BLM 2003a], which was approved as the Final Resource Management Plan for the Farmington Field Office (FFO) of the BLM by the Record of Decision (ROD) signed September 29, 2003 (BLM 2003b). The PRMP/FEIS, Final Plan, and Record of Decision are available for review at the BLM Farmington Field Office, 1235 La Plata Hwy., Farmington, NM or electronically at http://www.nm.blm.gov/ffo/ffo_home.html. This EA addresses the resources and impacts on a site-specific basis as required by the National Environmental Policy Act (NEPA) of 1969, as amended (Public Law 91-90, 42 USC 4321 et seq.). The 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 (as amended), the U.S. Environmental Protection Agency (EPA), was directed to develop a phased approach to regulate storm water discharges under the National Pollutant Discharge Elimination System (NPDES) program. Industrial activities disturbing land may require permit coverage through a NPDES storm water discharge. Depending on the acreage disturbed, either a Phase I industrial activity (five or more acres disturbance) or a Phase II small construction activities (between one and five acres disturbance) permit may be required. However, gas and oil activities were recently exempted from NPDES permitting. Additionally, an U.S. Army Corps of Engineers Section 404 permit for the discharge of dredge and fill materials may also be required. Operators are required to obtain all necessary permits and approvals prior to any disturbance activities.

Farmington Field Office staff reviewed the action and determined it is in compliance with threatened and endangered species management guidelines outlined in the September 2002 Biological Assessment (Cons. #2-22-01-1-389). No further consultation with the U.S. Fish and Wildlife Service is required.

Compliance with Section 106 responsibilities of the National Historic Preservation Act are adhered to by following the BLM- New Mexico SHPO protocol agreement, which is authorized by the *National Programmatic Agreement between the BLM,* the *Advisory Council on Historic Preservation*, and the *National Conference of State Historic Preservation Officers*, and other applicable BLM handbooks.

Additionally, the Operator is required to:

- Comply with all applicable Federal, State and Local laws and regulations.
- Obtain the necessary permits for the drilling, completion and production of this well including water rights appropriations, the installation of water management facilities, water discharge permits, and relevant air quality permits.
- Certify that a Surface Use Agreement has been reached with private landowners where required.

2.0 Alternatives Including the Action

2.1 Alternative A - No Action

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

2.2 Alternative B -Action

XTO re-drilled on the existing Stanolind Gas Com B 5 well bore in order to directionally drill and develop federal minerals in the Basin Fruitland Coal formation. Access to the proposed Stanolind Gas Com B 5H well pad is gained by traveling north on Hwy 574 for 9.5 miles from the intersection of Hwy 574 and Hwy 516 in Aztec, NM. Turn right and travel north easterly on dirt roads for 6.1 miles to the proposed Stanolind Gas Com B 5H staked well location. The project is on private land with federal minerals. The project area is located in the BLM/FFO designated East La Plata Wildlife Area. There is no new surface disturbance for the project.

The proposed well pad is twinned on the existing Stanolind Gas Com B 5 well pad, and is approximately 150' X 205'. The well pad required no cuts or fills on the location. Production pits are lined. All existing cut and fill slopes will be returned to the original contour upon reclamation. There is no new surface disturbance for the proposed well pad.

Runoff is diverted around the well site. A diversion ditch may need to be upgraded such that storm water run-off is diverted around the well pad.

No new access road was developed to provide access to the proposed well pad. The surfacing and repair of deteriorated sections of the existing access roads may be required. Culverts 24" minimum in diameter may be placed at the entrance of the well location and in low areas where necessary and according to "Gold Book" standards.

Once the proposed Stanolind Gas Com B 5H gas well is completed, the existing pipeline would be utilized, connecting the proposed Stanolind Gas Com B 5H to the existing Stanolind Gas Com B 5 pipeline. No new disturbance is required.

Production equipment used during the life of the well may include a 3-phase separator- dehydrator, a meter run, 400-barrel tanks and/or smaller fiberglass or galvanized tanks for water disposal. It is also likely that a compressor is placed on the location during the life of the well. The use of compressors provides an increase in the economic life of the well increases the ultimate recovery of gas from low-pressure reservoirs and prevents waste of the gas resource.

Farmington Field Office established environmental Best Management Practices (BMP's) will be followed during construction and reclamation of well site pads, access roads, pipeline ties, facility placement or any other surface disturbing activity associated with this project, or would follow the surface use agreement with the private surface owner. Bureau wide standard BMP's are found in the Gold Book, Fourth Edition-Revised 2007. Farmington Field Office BMP's are integrated into the general and site specific stipulations.

For a detailed description of design features and construction practices associated with the action, refer to the APD (attached as Appendix 7.1). Also see the subject APD for additional maps showing the proposed well location and associated facilities described above. Implementation of committed mitigation measures contained in the Conditions of Approval (COAs) are also listed in Appendix 7.1 and incorporated and analyzed in this alternative. Site specific stipulations and mitigation measures included:

- All pits meet State of New Mexico, Oil Conservation Division (NMOCD) pit guidelines and requirements, NMAC 19.15.17.
- A tight sheep fence is constructed around three sides of the pit during drilling and completion, and around the fourth side after the completion rig leaves the wellhead. The fences would remain until the pits are dried and backfilled.
- Reclaimed slopes will be re-contoured to pre-construction topographical contours.
- Cut material from the reserve and burn pits will be stockpiled on the location or used to construct the back-walls of the burn pit.
- All disturbed areas not needed for production will be seeded with the FFO specified seed mixture, using native species only,
- Above ground structures are painted to blend with the natural color of the landscape. Paint color is Juniper Green (Federal Standard 595a-17127).
- Additional 24" culverts and silt traps for the access road and other necessary hydrologic BMPs is installed as necessary for proper drainage and sediment management.
- All cultural resource stipulations are followed.
- The Surface Use Agreement stipulations are followed.
- The action area is located in the BLM/FFO designated East La Plata Wildlife Area (BLM 2003a, pg. C-161). No construction is allowed in this area between December 1st and March 31st to protect wintering game.

Table 2.2 – Proposed Well Information

Stanolind Gas ComB	5H	32N	12W	9	Surface: 804' FSL 649' FEL	NMNM 0019414	10/1/1955
		32N	12W	9	Bottom Hole: 1444'FSL 2089' FEL		

County: San Juan

Applicant: XTO Energy Inc.

Surface Owner: Bureau of Land Management

2.3 Alternatives Considered But Not Analyzed In Detail

No additional alternative has been considered for this project. The project location overlaps an existing well pad and is adjacent to an existing roadway, therefore, moving the project location in any direction would require greater disturbance due to construction of a new well pad, new pipeline and a new access road. The proposed location was selected for the best drainage of subsurface resources while protecting surface resources to the maximum extent possible.

3.0 Description of Affected Environment

This section describes the environment that is affected by implementation of the alternatives described in Section 2. Aspects of the affected environment described in this section focus on the relevant major resources or issues. Certain critical environmental components require analysis under **BLM** policy. These items are included below in Table 3.0. Following the table, only the aspects of the affected environment that are potentially impacted are described.

Table 3.0 – Affected Environment and Basis for Determination No Further Analysis

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
CRITICAL ELEMENTS OF THE HUMAN ENVIRONMENT				
Air Resources	X		X	
Areas of Critical Environmental Concern		X	X	
Cultural Resources	X		X	
Native American Religious Concerns		X	X	
Environmental Justice		X	X	
Farmlands, Prime or Unique		X	X	
Floodplains		X	X	
Invasive, Non-native Species		X	X	
Threatened or Endangered Species		X		BLM/FFO review determined compliance with threatened and endangered species management guidelines outlined in the Sept. 2002 Biological Assessment. No further Section 7 ESA consultation with the USFWS is required.
Wastes, Hazardous or Solid		X	X	
Water Quality - Surface/Ground	X		X	
Wetlands/Riparian Zones		X	X	
Wild and Scenic Rivers		X		There are no Wild and Scenic Rivers in Farmington Field Office no indirect effects are projected outside the FFO.
Wilderness		X		Project is greater than 30 miles from the nearest Wilderness Area or Wilderness Study Area. No indirect effects are

				projected.
NON-CRITICAL ELEMENTS				
General Topography/Surface Geology	X		X	
Mineral Resources	X		X	
Paleontology		X	X	
Soils	X		X	
Watershed/Hydrology	X		X	
Vegetation, Forestry	X		X	
Livestock Grazing	X		X	
Special Management Species		X	X	
Wildlife	X		X	The action area is located in the BLM/FFO designated East La Plata Wildlife Area.
Wild Horse and Burros		X	X	
Recreation		X	X	
Visual Resources	X		X	
Public Health and Safety		X	X	

3.1 Air Resources

The well is located in San Juan County, New Mexico. Additional general information on air quality in the area is contained in Chapter 3 of the Farmington RMP/EnvironmentalImpact Statement. In addition to the air quality information in the RMP cited above, new information about greenhouse gases (GHGs), and their effects on national and global climate conditions has emerged since this RMP was prepared. On-going scientific research has identified the potential impacts of GHG emissions such as carbon dioxide (C02) methane (CH4); nitrous oxide (N20); 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 RMP 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 Environmental Protection Agency (EPA) 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 Environmental Protection Agency (EPA), on October 17, 2006, issued a final ruling on the lowering of the National Ambient Air Quality Standard (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 PM2.5, was lowered to 35 ug/m^3 from the previous standard of 65 ug/m^3. This revised PM2.5 daily NAAQS was promulgated to better protect the public from short-term particle exposure.

This EA incorporates an analysis of the contributions of the 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 Environmental Protection Agency (EPA) 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 EPA, however climate has the potential to influence renewable and non-renewable resource management.

3.1.1 Air Quality

The area of the 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 Environmental Protection Agency 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. Rio Arriba County is unclassified because of there are no ozone monitors sited in Rio Arriba County.

Greenhouse gases, including carbon dioxide (C02) and methane (CH4), and the potential effects of GHG emissions on climate, are not regulated by the EPA under the Clean Air Act. However, climate has the potential to influence renewable and non-renewable resource management. The EPA'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 C02 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 (EPA 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 GHG's result in behavioral and industrial adaptations.

3.1.2 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 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.

3.2 Areas of Critical Environmental Concern (ACECs)

Areas of Critical Environmental Concern (ACEC) were designated in the FFO/BLM 2003 FRMP, under authority of the FLPMA of 1976 allowing for multiple use of lands administered by the BLM. The ACEC designation pertains to "...areas within public lands where special management attention is required (when such areas are developed or used or where no development is required) to protect and prevent irreparable damage to important historical, cultural, or scenic values, fish and wildlife resources or other natural systems or processes, or to protect life and safety from natural hazards." (FLPMA 1976 Sec. 103, 43 U.S.C. 1702 et seq.).

The action is not located in any BLM/FFO designated Areas of Critical Environmental Concern (ACECs).

3.3 Cultural Resources

The action area 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 B.C. to A.D. 400), Basketmaker II-III and Pueblo I-IV periods (aka Anasazi; 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. Detailed description of these various periods and select phases within each period is provided in the Bureau of Land Management Farmington Field Office Final Environmental Impact Statement (2003) and will not be reiterated here. Additional information is also included in an associated documented, Cultural Resources Technical Report (CRTR; SAIC 2002).

The BLM FFO has categorized variability in archeological sites by major time period, cultural affiliations/components, average size, and occurrence of features in each of the 20 watersheds within the BLM FFO's jurisdiction (BLM 2003b:3-88). The Stanolind Gas ComB 5H is within the La Plata watershed. Based on the CRTR (SAIC 2002) a total of 1071 sites representing 1621 temporal/cultural components have been documented within the watershed. Of the 19 categories of sites defined based on temporal/cultural affiliation, 17 are represented. Lacking in the watershed are sites attributed to PaleoIndian and Apache occupations. The most frequently occurring cultural affiliation recorded are Anasazi. Features common to these sites include pueblos, kivas, and pit houses.

The entire area of potential affect for the well was surveyed at a BLM Class III level (100%) and an inventory report was prepared and submitted to the BLM (10-DCA-066; BLM No. 2010(IV}027F) in accordance with the *Procedures for Performing Cultural Resources Fieldwork on Public Lands in the Area of New Mexico BLM Responsibilities* (BLM 2005). The Class III inventory identified one site within the area of potential affect. Site LA167375 is an artifact scatter of unknown age or cultural affiliation. The site is not eligible for the National Register of Historic Places.

3.4 American Indian Religious Concerns

Traditional Cultural Prosperities (TCPs) is a term that has emerged in historic preservation management and the consideration of Native American religious concerns. TCPs are places that have cultural values that transcend, for instance, the values of scientific importance that are normally ascribed to cultural resources such as archaeological sites. The National Park Service (Parker and King 1998:1) 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)

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

There are several pieces of legislation or Executive Orders that should be considered when evaluating Native American religious concerns. These govern access and use of scared sites, possession of sacred items, protection and treatment of human remains, and the protection of archaeological resources ascribed with religious or historic importance. These include the following:

- The American Indian Religious Freedom Act of 1978 (AIRFA; 42 USC 1996, P.L. 95-431 Stat. 469).
  - Possession of sacred items, performance of ceremonies, access to sites
- Executive Order 13007 (24 May 1996).
  - Access and use of sacred sites, integrity of sacred sites
- The Native American Graves Protection and Repatriation Act of 1990 (NAGPRA; 25 USC 3001, P.L. 101-601).
  - Protection, ownership, and disposition of human remains, associated funerary objects, unassociated funerary objects, sacred objects, or objects of cultural patrimony
- The Archaeological Resources Protection Act of 1979 (ARPA; 16 USC 470, Public Law 96-95).
  - Protection or archaeological resources on Federal and Indian lands

For the Stanolind Gas ComB 5H, identification of TCPs were limited to reviewing existing published and unpublished literature (e.g. Valkenburgh 1941, 1974), and the site-specific cultural resources survey report conducted for the Proposed Action. In addition, the BLM's cultural resources program was

contacted for information regarding the presence of TCPs identified through ongoing BLM tribal consultation efforts. There are no known TCPs in association with this undertaking.

3.5 EnvironmentalJustice

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 Farmington Field Office (see pages 3-106 to 3-107 of the PRMP/FEIS for more details on ethnicity and poverty rates).

3.6 Farmlands, Prime or Unique

Several of the watersheds within the Farmington Field Office boundaries have some soils meeting the definition of prime farmland, all of which must be irrigated to produce high quality crops (BLM 2003a, pg
3-19).

The action is not located within any soil units known to contain prime or unique farmlands (BLM 2003a, pg 3-22).

3.7 Floodplains

A review of the GIS data on active and 100-year floodplains (derived from Federal Emergency Management Agency floodplain maps) indicates the action is not located within any designated floodplains.

3.8 Invasive, Non-Native Species

The objective of the Farmington Field Office weed management program is to detect invasive plant species populations, prevent the spread of new invasive populations, manage existing populations using the tools of integrated weed management and eradicate invasive populations, using the safest environmental methods available. For all actions on public lands that involve surface disturbance or rehabilitation, reasonable steps is required to prevent the introduction or spread of noxious weeds, including requirements for using weed seed-free hay, mulch and straw.

BLM GIS data of known invasive or noxious weed populations indicate no known weed populations to be in or nearby the project area.

3.9 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 U.S. Environmental Protection Agency (EPA) 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 EPA 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 natural gas. On July 6, 1988, EPA determined that oil and gas exploration, development and production (ED&P) 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 EPA. 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 the Oil Conservation Division (OCD) administers hazardous waste regulations for oil and gas activities in New Mexico.

No hazardous or solid waste materials are present at the action site. The notification of releases such as natural gas, natural gas liquids, and petroleum, outside a facility site is required under CERCLA and under BLM NTL-3A.

3.10 Water Quality – Surface/Ground

Availability of water quality data, like stream-flow data, is largely limited to the perennial streams in the northern part of the San Juan Basin. The water quality of the perennial streams varies from upstream to downstream and is strongly influenced by the type of rock and soils with which the water has been in contact. In the upper reaches, the perennial streams have relatively low concentrations of dissolved solids. In the middle and lower reaches, the streams contain progressively more magnesium, calcium, sodium and sulfate concentrations and vary according to flow conditions.

Quality data for the ephemeral runoff south of the San Juan River are limited to only a few observations at sampling stations associated with the USGS coal hydrology program. Ephemeral flows are generally very poor quality water due to the highly erosive and saline nature of the soils. Sparse vegetative cover and rapid runoff conditions are characteristic of the area.

There are no perennial water resources within the immediate vicinity of the action area. The action area is located along Jaquez Arroyo. The project area drains south west approximately 0.1 mile into Jaquez Arroyo, which flows south west approximately 3.7 miles into McDermott Arroyo. McDermott Arroyo drains into the La Plata River (perennial) approximately 6.3 miles south west.

The San Juan Basin is underlain by sandstone aquifers and unconsolidated sand and gravel aquifers. The Colorado Plateaus Aquifers are sandstone while the Rio Grande Aquifer system is unconsolidated sand and gravel. The primary Colorado Plateaus Aquifers underlie the vast majority of the San Juan Basin are the Uinta-Animas Aquifer and the Mesa Verde Aquifer.

The quality of groundwater in the San Juan Basin generally ranges from fair to poor. The Uinta-Animas contains fresh to moderate saline water and the quality of the Mesa Verde is extremely variable. In general, areas of the aquifer that are recharged by infiltration from precipitation or surface water sources contain relatively fresh water.

The operator set surface casing to a depth of 250 feet, or as specified by the BLM, to protect any shallow aquifers. An operation plan with the proposed casing program to protect the aquifers is submitted with the APD.

3.11 Wetlands/Riparian Zones

Field inspection of the action area and a review of BLM GIS data indicate the action area is not located within any riparian or wetlands habitat.

3.12 General Topography/Surface Geology

The action area is located above Jaquez Arroyo in gently sloping bench terrain. Elevation in the immediate project area ranges from 6,040-6,055 feet.

3.13 Mineral Resources

Federal lands in the San Juan Basin are important sources of mineral materials for construction projects in the region, including sand and gravel, rock and stone and other fill materials. The action is not located on any permitted surface mineral mining operation or free use area.

3.14 Paleontology

The Farmington Field Office Resource Management Plan identified specific areas within the region as Specially Designated Areas (SDA) for the protection of paleontological resources within the Nacimiento Formation.

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 project area is located within the paleontological rich area of the San Juan Basin of northern New Mexico.

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

3.15 Soils

The San Juan Basin is bordered by the Defiance Uplift and Chuska Mountains to the west, San Juan Dome to the north, Chaco Slope and Zuni Uplift to the south and the Nacimiento Uplift to the east. In total, the San Juan Basin covers a surface of approximately 4,600 square miles. The soils in the San Juan Basin were formed primarily from two kinds of parent material: alluvial sediment and sedimentary rock. The alluvial sediment is material that was deposited in river valleys and on mesas, plateaus, and ancient river terraces. The material has been mixed and sorted in transport and has a wide range of mineralogy and particle size. Sedimentary parent material consists mainly of sandstone and shale bedrock. These shale and resistant sandstone beds form prominent structural benches, buttes, and mesas bounded by cliffs.

Soils in the immediate area of the action is comprised of the Blancot-Notal association, gently sloping. The Blancot-Notal association is found on fans and in valleys with slopes of 0 to 5 percent. This soil unit is about 55 percent Blancot loam, 25 percent Notal silty clay loam, and 20 percent other soil inclusions. This soil unit is deep and well drained, and formed in alluvium derived dominantly from sandstone and shale. The surface is pale brown loam about two to three inches thick. The subsoil is pale brown an light brownish gray clay loam about 13 to 20 inches thick. The substratum to a depth of 60 inches or more is light grayish brown sandy clay loam. The permeability of the Blancot portion is moderate and the water capacity is high. The permeability of the Notal portion is very slow and the water capacity if very high. The runoff potential for this soil unit is medium, and the hazard of water erosion is moderate. The potential plant community of this soil unit is western wheatgrass, galleta, Indian ricegrass, and fourwing saltbush. The different characteristics of these soil types are listed below.

Table 3.15.1

Type	Pale brown	Brown silty clay loam
Slope	0-5%	0-2%
Depth	2-60 inches	3-60 inches
Surface Runoff	Medium	Medium
Water Erosion	Moderate	Moderate
Soil Blowing	Moderate	Severe
Drainage Class	Deep and well drained	Deep and well drained
Available Water Cap.	High	Very high
Permeability	Moderate	Very slow
Parent Material	Sandstone and shale	Sandstone and shale

3.16 Watershed- Hydrology

The San Juan Basin consists of broad mesas interspersed with many deep canyons with steep canyon walls, dry washes, entrenched narrow valleys, and alluvial fans and floodplains. Elevations range from approximately 4,800 feet, where the San Juan River flows into Utah, to approximately 8,800 feet near the Jicarilla Apache land, and near 7,300 feet near Lindrith, New Mexico. The planning area is divided into watersheds based on the Hydrologic Units (4th level) delineated by the USGS. Principally, the administrative area under the jurisdiction of the Farmington Field Office consists of five of these 4th level hydrologic watershed units. These watershed units are: (1) Middle San Juan, (2) Animas, (3) Upper San Juan, (4) Blanco Canyon, and (5) Chaco. The action area is within the Upper San Juan watershed.

3.17 Vegetation, Forestry

The action area is located within a sagebrush vegetation community. The action did not remove any trees.

3.18 Livestock Grazing

There are 167 grazing allotments managed by the Farmington Field Office 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. There are an additional 30 section 15 authorizations that permit grazing on 30 allotments in the Lindrith, NM area.

The action area is located within the Hartley Springs Allotment #5020. The grazing allotment is operated from December 1 through May 31 annually with a maximum of 154 head of cattle. This allotment consists of 25% public land.

3.19 Wild Horse and Burros

There are no areas managed for wild horse or burros within the action area. The action area lies over 20 miles southwest of the Jicarilla Wild Horse Territory. No wild horses or burros, or sign of wild horses or burros, exist nor are suspected to exist in the action area.

3.20 Wildlife

Mule deer and Elk are common in the action area as are other common mammalian species such as the coyote, deer mouse, and the black-tailed jackrabbit. Game birds found in the area may include mourning dove. Migratory birds that may be present can include the western bluebird, scrub jay, juniper titmouse, and common raven, principal raptors that may be seen are the Golden eagle, Red-tailed hawk and American kestrel. Nesting neo-tropical migratory birds could include the western bluebird, gray vireo, violet-green swallow, and ash-throated flycatcher. No evidence of nesting birds was observed in the action area at the time of field inspections. The most notable reptiles are the eastern fence lizard and the short-horned lizard.

The action area is located in the BLM/FFO designated East La Plata Wildlife Area (BLM 2003a, pg. C-161). No construction will be allowed in this area between December 1st and March 31st to protect wintering game. There are a total of 7,159 acres with the boundary of this management area, of which 5,895 are public land acres (BLM) and 5,814 are federal mineral acres. Standard mitigation measures to protect or restore wildlife habitat can be found in the Farmington Resources Management Plan (December 2003) pages 2-25 and 2-26.

3.21 Migratory Birds

The Migratory Bird Treaty Act (MBTA) of 1918 (16 USC§§ 701-715s, as amended), established protections for migratory birds and their parts (i.e. eggs, nests, and feathers) from taking, hunting, capture, transport, sale, or purchase. Information from the New Mexico PIF website (http://www.hawksaloft.org/pif.shtml), the New Mexico PIF highest priority list of species of concern by vegetation type, and the 2002 Birds of Conservation Concern Report for the Southern Rockies/Colorado

Plateau Bird Conservation Region (BCR) No. 16 have been used to develop a list of migratory bird species with potential to occur in the action area. The species listed below have not been located within the action area.

Common Name (Scientific name)	Habitat Associations
Loggerhead shrike *(Lanius /udovicianus)*	Relatively xeric habitats dominated by shrubs and grasses.
Sage thrasher *(Oreoscoptes montanus)*	Sagebrush plains
Sage Sparrow *(Amphispiza belli)*	Sagebrush-grassland habitat
Black-throated sparrow *(Amphispiza bilineata)*	Xeric habitats dominated by open shrubs with areas of bare ground.
Burrowing Owl *(Athene cunicularia)*	Open grasslands or desert scrub. Presence of suitable nest burrow is critical prerequisite (often prairie dog burrows).
Bendire's Thrasher *(Toxostoma bendirei)*	Brushy desert, especially areas of tall vegetation, cholla cactus, creosote bush and yucca.
Ash-throated Flycatcher *(Myiarchus cinerascens)*	Arid and semiarid scrub, open woodland, and riparian woodlands.

3.22 Special Management Species

In accordance with BLM Manual 6840, 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. Included in this category are state listed endangered species and federal candidate species which receive no special protections under the Endangered Species Act. Special Management Species with potential to occur in the action area are listed in Table 3.23.

Table 3.22– Special Management Species of the BLM/FFO and their potential to occur in the action area.

Common Name *(Scientific name)*	Status*	Habitat Associations	Presence**
BIRDS			
American peregrine falcons *(Falco peregrinus anatum)*	SMS NM-T	Nest in ledges or potholes on cliffs in wooded/forested habitats; Forage over riparian woodlands, coniferous & deciduous forests, shrublands, prairies.	NS
Ferruginous hawk *(Buteo rega/is)*	SMS	Breed in open country, usually prairies, plains and badlands; semidesert grass-shrub, sagebrush-grass & pinon-juniper plant associations.	NS
Golden eagle *(Aquila chrysaetos)*	SMS	In the west, mostly open habitats in mountainous, canyon terrain. Nests primarily on cliffs and trees.	NS
Bald eagle *(Haliaeetus leucocephalus)*	SMS NM-T	Nests in forested areas adjacent to large bodies of water.	NP

Burrowing Owl *(Athene cunicularia)*	SMS	Open grasslands or desert scrub. Presence of suitable nest burrow is critical prerequisite (often prairie dog burrows).	NP
Prairie falcon *(Falco mexicanus)*	SMS	Open: grassland, desert scrub, rangeland, agricultural; nest in cavities, ledges, on cliffs, trees, power structures.	NS
Mountain plover *(Charadrius montanus)*	SMS	Lowland grasslands, sites with grassland characterists (alkali flats, agricultural lands).	NP
Yellow-billed cuckoo *(Coccyzus americanus)*	SMS C	Breeds in riparian woodlands with dense, understory vegetation.	NP
PLANTS			
Brack's hardwall cactus *(Sclerocactus cloveriae ssp brackii)*	SMS NM-E	Sandy clay of the Nacimiento Formation in sparse shadscale scrub (5,000-6,000 ft.)	NP
Aztec gilia *(Aiiciella formosa)*	SMS NM-E	Salt desert scrub communities in soils of the Nacimiento Formation (5,000-6,000 ft).	NP
Sources: BLM 2005, New Mexico Natural Heritage Program 2005, NM Rare Plant 1999, USFWS 2007			
Status* SMS = BLM Special Management Species C = Federal Candidate NM-E = State of NM Endangered NM-T =State of NM Threatened		Presence** 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.	

The action area provides potential foraging habitat for the American peregrine falcon, Prairie falcon, Golden eagle, and Ferruginous hawk. The action area does not provide nesting habitat for the four raptors. No birds of prey or signs of their presence were observed during onsite inspections. The nearest recorded SMS raptor nest, a Golden Eagle nest, lies 2.7 miles south east of the action area.

3.23 Visual Resources

Visual Resource Management (VRM) on public lands is conducted in accordance with BLM Handbook 8410 and BLM Manual 8411. Further details of the Farmington Field Office VRM Program are contained on pages 2-9 to 2-10 and 3-61 to 3-63 of the Farmington PRMP/FEIS.

The action area is located in an area designated by the BLM/FFO as VRM Class III. Management objectives for Class III designation include partially retaining the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention, but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape (BLM Manual 8431, Appendix 2).

3.24 Recreation

The Farmington Field Office has set aside several areas for special use and manages them as Specially Designated Areas (SDA). The action area would not be in a SDA for recreation. Dispersed recreational use of the areas may include occasional hunting during the hunting season. The proposed action is located on private land and is outside of BLM jurisdiction.

3.25 Public Health and Safety

All worker safety is governed by Occupational Safety and Health Administration (OSHA) safety laws and regulations. Worker safety incidents must also be reported to the BLM under the procedures of Notice to Lessee (NTL)-3A. Pipeline safety regulations are administered by OSHA as well as Department of Transportation (DOT) regulations. Pipeline safety regulations (49 CFR Parts 190 and 192) govern design, construction and operation of gas transmission lines. Any incidents involving DOT-regulated pipelines must be reported under these regulations (District 2003a).

Most substances and wastes generated at oil and gas facilities are exempt from regulation under the Resource Conservation and Recovery Act (1976). The Environmental Protection Agency (EPA) and DOT regulate materials associated with well construction and production activities that are classified as hazardous. When significant amounts of chemicals are stored on-site, governmental agencies will be notified as required under the Emergency Planning and Community Right to Know Act (1986). The notification of releases such as natural gas, natural gas liquids, and petroleum, outside the facility site is required under the Comprehensive Environmental Response Compensation and Liability Act, 1980 (CERCLA) and under BLM NTL-3A. The well location must have an informational sign, as directed under 43 CFR 3160.

Additional hazards to the general public in the action area include safety hazards associated with increased traffic during the construction of the proposed or alternative well. General hazards around producing oil and gas fields such as accidental pipeline failures and moving equipment like pump jacks are potential/present in the action area. Hydrogen sulfide gas is not known to be or expected to be a problem within the action area.

4.0 Environmental Consequences and Proposed Mitigation Measures

No Action
Under the No Action Alternative, the well would have been drilled. There are no new impacts from oil and gas production to the resources. The No Action Alternative would result in the continuation of the current land and resource uses in the project area and is used as the baseline for comparison of alternatives.

Action
A summary of surface disturbance is presented in Table 4.0. Descriptions of potential effects on individual resources for the action are presented in the following text. Also described are potential mitigation measures that could be incorporated by the BLM where appropriate as Conditions of Approval attached to the permit.

Table 4.0- Summary of Disturbance

Facility		Alternative B		Duration
		Feet	Acres	
Well Pad	New Disturbance	OxO	0.00	Long Term
	Existing Disturbance	150x205	0.70	Long Term
Construction Zone	New Disturbance			Short Term
	Existing Disturbance			Short Term
Pipeline	New Disturbance			Short Term
	Existing Disturbance			Long Term
Road				Long Term
Total New Disturbance			0.00	

(*) - Approximate disturbances based on similar XTO well location proposals.
Short-term impacts are those which can be stabilized or mitigated rapidly (within 5 years). Long-term impacts are those that would substantially remain for more than 5 years.

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 that 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.

4.1 Air Resources

4.1.1 Direct and Indirect Effects

4.1.1.1 Air Quality

Air quality was temporarily directly impacted with pollution from exhaust emissions, chemical odors, and dust that is 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 is 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 Farmington Field Office 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 GHG's) 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 GHG, 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 RMP demonstrated 522 wells is 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 Wenimuche 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 EPA 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.

4.1.1.2 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 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 is incorporated into the BLM's planning and NEPA documents as appropriate.

4.1.2 Potential Mitigation

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/RMP and provisions in the ROD for the FEIS/RMP 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 N20 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 EIS/RMP. The impacts forecast by the RFD are still valid. At the time the 2003 EIS/RMP was written, ozone readings did not represent a violation of the NAAQS for this pollutant. The New Mexico Environment Department 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 EPA'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 C02 and CH4 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 EPA 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/m^3 daily PM2.5 NAAQS is not expected to be exceeded under the action alternative.

The EPA 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 EPA's Natural Gas Energy Star program. The Farmington Field Office 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 Areas of Critical Environmental Concern

No effect.

4.3 Cultural Resources

4.3.1 Direct and Indirect Effects

Direct effects normally include alterations to the physical integrity of the cultural resources. If a cultural resource is significant for other than its scientific information, direct effects may also include the introduction of audible, atmospheric, or visual elements that are out of character for the cultural site. Based on a review of the archaeological reports and the assessment of the undertaking in this area, the BLM cultural resources staff has determined that the action will have no effect on cultural resources.

4.3.2 Potential Mitigation

No mitigation of effects to site LA 167375 is necessary. The site is not eligible for the National Register of Historic Places.

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

4.4 American Indian Religious Concerns

4.4.1 Direct and Indirect Effects

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

4.4.2 Potential Mitigation

No mitigation measures have been recommended for the action.

4.5 Environmental Justice

4.5.1 Direct and Indirect Effects

No minority or low income populations are directly affected in the vicinity of the action area. Indirect effects could include effects due to overall employment opportunities related to the oil and gas and service support industry in the region as well as the economic benefits to state and county governments related to royalty payments and severance taxes. Other effects could include a small increase in activity

and noise disturbance in areas used for grazing, wood gathering, or hunting. However, these effects would apply to all public land users in the project area. A more detailed description of potential impacts is contained in the PRMP/FEIS p.4-120 and 4-129.

4.6 Farmlands, Prime or Unique

No effect.

4.7 Floodplains

No effect.

4.8 Invasive, Non-native Species

4.8.1 Direct and Indirect Effects

Weeds (invasive/nonnative vegetation) can be introduced in many ways, including wind, vehicles, heavy equipment, livestock, and wildlife. The potential for weeds to invade or spread within an area is increased when native vegetation is removed and physical disturbance to the soil occurs. Establishment of weeds usually occurs in disturbed sites such as oil/gas pads, pipelines, stock water ponds, and edges of roads.

The Farmington Field Office and the operator will follow BLM policy to control and manage invasive nonnative vegetation species.

4.8.2 Potential Mitigation

It is the responsibility of the operator to control and eradicate all noxious/invasive weeds within either project area during the life of the project.

4.9 Wastes, Hazardous or Solid

Typical wastes associated with the action would include trash, sewage, produced water, and produced hydrocarbons. During drilling and completion, a trash receptacle and a chemically treated portable toilet is on location for trash and sewer disposal. All produced hydrocarbons is put in tanks on location during completion work. Produced water is put in onsite tanks or within lined reserve pit during completion work. All wastes is disposed of in a proper manner as required by federal and state law and as described in the COAs.

When significant amounts of chemicals are stored on-site, governmental agencies is notified as required under the Emergency Planning and Community Right to Know Act (1986). The notification of releases such as natural gas, natural gas liquids, and petroleum, outside the facility site is required under the Comprehensive Environmental Response Compensation and Liability Act, 1980 (CERCLA) and under BLM NTL-3A. The well location must have an informational sign, as directed under 43 CFR 3160.

4.10 Water Quality: Surface and Groundwater

4.10.1 Direct and Indirect Effects

There are no perennial water sources, springs, seeps, wetlands or well defined ephemeral drainages within the action area. Effects to ground water resources is low due to mitigation measures such as casing. Below casing depth, losses of produced water or mud may occur to differing degrees in various formations, but the losses are considered to be low and contained to within a few feet of the well bore.

These losses are not considered to be substantial because of the very small amount of groundwater that could be affected (BLM 2003a, p. 4-14).

4.10.2 Potential Mitigation

Culverts, diversions, and silt traps, where indicated in the attached COA's, is used to stabilize and reduce sediment flow. The Operator is responsible to ensure an adequate casing program is designed to protect ground water from contamination. Onshore Order #2 requires that all useable aquifers be protected by casing or cementing. All pits is lined to prohibit drilling and production fluids from infiltrating into groundwater resources or flowing into surface water resources.

4.11 Wetlands/Riparian Zones

No effect.

4.12 General Topography/Surface Geology

No prominent topographical features were removed or disturbed by the action.

4.13 Mineral Resources

No effect.

4.14 Paleontology

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

4.14.1 Direct and Indirect Effects

Although no paleontological resources are known to occur within the project area, impacts to paleontological resources from the project implementation could possibly occur. Direct impacts of the 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. Additionally there could be an increase in off-road vehicular access from the project area for recreational activities. 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 action is low and long-term.

4.14.2 Potential Mitigation

All BLM/FFO paleontological resources stipulations will be followed as indicated in the COAs, attached to the APD. These stipulations may include, but are not limited to temporary or permanent fencing or other physical barriers, monitoring of earth disturbing construction, project area reduction and/or specific construction avoidance zones, and employee education. Upon review, a determination for final project clearance and stipulations shall be issued by the BLM/FFO.

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

4.15 Soils

4.15.1 Direct and Indirect Effects

Due to the nature of drilling for oil and gas there is soil disturbance within the action location. All areas disturbed were bladed as needed to create flat surfaces for operating equipment and vehicles. Depth of soil disturbance would increase with rougher topography. Available topsoil was stockpiled for reclamation. The cut and fill slopes on the action are especially susceptible to wind and water erosion until vegetation has been reestablished (one to two growing seasons). The potential impacts is dependant, in part, on seasonal variation in rainfall and snowmelt run-off, terrain, soil type, prevailing winds, and vegetative cover. The heaviest amounts of erosion will be short-term (one to two growing seasons) until the vegetation has established. Effects to soils were likely be low to moderate for the action.

4.15.2 Potential Mitigation

Re-vegetation will reduce or minimize impacts created by water and/or wind erosion. Approximately half of the well location and the entire well-tie pipeline disturbance is reclaimed. The remaining surface disturbances would remain disturbed for the life of the well for production equipment and vehicle travel surfaces. Following final down-hole plugging and abandonment of the well, the entire well pad and access road is reclaimed.

Other mitigation could include culverts, diversion ditches, berms, and other such soil erosion control structures (see attached COAs). Existing dirt roadways may be re-ditched and re-crowned or surfaced at the direction of the BLM, to minimize sedimentation.

4.16 Watershed – Hydrology

4.16.1 Direct and Indirect Effects

The action would comply with water quality, quantity, and ground water protection standards under the Clean Water Act of 1977, and the Safe Drinking Water Act of 1974 as amended. The action would disturb less than five (5) acres; currently, a Storm Water Pollution Prevention Plan for the Environmental Protection Agency (EPA) under the Clean Water Act would not be required.

The Operator is required to comply with any future changes to the National Pollutant Discharge Elimination System permitting process for storm water discharge from construction activities enacted by the EPA prior to the completion of well construction and site stabilization. The action would not cross any ephemeral washes; therefore, a Nationwide 404 Permit from the U.S. Army Corps of Engineers, Albuquerque District Office would not be required.

4.16.2 Potential Mitigation

Drainage diversions are constructed for the action. The diversions are directed such that water will drain away from the pad. Culverts are installed where needed to maintain drainages along access roads (see attached GOA's).

4.17 Vegetation, Forestry

4.17.1 Direct and Indirect Effects

Direct impacts is the removal of shrubs, and grasses to construct the well pad and pipeline for the action. The action removed approximately 0 acres of established vegetation and did not remove any trees. Indirect impacts is the remaining long-term (20-30 years) disturbance of the well location used for

production equipment and vehicle driving surfaces. The removal of vegetation is projected to have low effects on the general vegetation as the species of plants to be removed are widespread and abundant in the action area and throughout the San Juan Basin.

4.17.2 Potential Mitigation

Under the action the completion of the construction, drilling and the well being placed into service, the rehabilitation and reseeding of the unused portion of the well pad and pipeline would occur. Those surfaces used for production equipment and vehicle travel is reclaimed as directed by the conditions of approval (GOA's) after final abandonment of the well.

4.18 Livestock Grazing

4.18.1 Direct and Indirect Effects

There was no temporary loss of acreage prior to rehabilitation and reseeding. There was no reduction in AUMs.

4.18.2 Potential Mitigation

Mitigation measures associated with soils, water, riparian and wildlife serve to lessen impacts to the rangeland components essential for rangeland health.

4.19 Wild Horse and Burros

No effect.

4.20 Wildlife

4.20.1 Direct and Indirect Effects

Some temporary displacement of wildlife could occur during the construction, drilling and completion phase of the project. Potentially affected species include the cottontail, blacktailed jackrabbit, mule deer, coyote, and other species that typically utilize such habitat.

The action removed no acres of potential habitat for such species. There are approximately 435,500 acres of sagebrush or desert scrub habitat and 633,400 acres of pinon-juniper woodland in the BLM/FFO planning area (BLM 2003a, pg 3-31). Habitat in the action area is not unique to the planning area and is common throughout the northern half of the planning area. Effects to wildlife is low for oil and gas development that adheres to proper conditions of approval.

4.20.2 Potential Mitigation

Standard mitigation measures to protect or restore wildlife habitat can be found in the RMP (December 2003) pages 2-25 and 2-26. All construction activities are confined to permitted areas only. Rapid and permanent vegetation and cover reestablishment would minimize impacts to wildlife. All hazards associated with construction and operation of the action is fenced or contained in storage tanks.

4.21 Migratory Birds

4.21.1 Direct and Indirect Effects

Adult migratory birds are not be directly harmed by the action because of their mobility and ability to avoid areas of human activity. Any nests within the area of the action may be directly impacted, along with eggs and juveniles. The increased human presence during construction, drilling, and reclamation activities may indirectly disturb or displace adults from nests and foraging habitats for a short period of time, three months or less. Long term production operations would result in only a slight increase in human activity in the immediate action area. Effects to the population status of migratory birds are not anticipated due to the mobility of individuals and the abundance of adjacent habitat for these species. In consideration of these factors, there is low short-term effects to migratory birds, and minimal long-term effects as a result of the action.

Potentially affected migratory bird species listed by New Mexico Partners in Flight as priority for management include black-throated gray warbler, gray flycatcher, ash-throated flycatcher, juniper titmouse, pinon jay, Western bluebird, mountain bluebird, Cassin's kingbird, and Say's phoebe for pinon-juniper habitat; and Bendire's thrasher, sage thrasher, loggerhead shrike, sage sparrow, and brewer's sparrow for sagebrush habitat. Wildlife and bird species may lose nesting/den/burrow habitat and foraging habitat.

4.21.2 Mitigation Measures

Project mitigation measures are designed to minimize effects on migratory birds and other wildlife. These measures include netting of any permanently open pits and vent caps on all open pipes to prevent bird entry and nesting. All construction activities are confined to permitted areas only. Rapid and permanent vegetation and cover reestablishment would minimize impacts to migratory birds. All hazards associated with construction and operation of the action is fenced or contained in storage tanks.

Best Management Practices (BMPs) are used to avoid or minimize the possibility of the unintentional take of migratory birds, as instructed in the MBTA Washington Office Interim Management Guidance and BLM/FFO Interim Management Policy (MOU No. NM-F00-2010-001). If project disturbance is over 4.0 aces of vegetative disturbance, then no construction activities from May 15 to July 31 will be permitted without a BLM/FFO approved migratory bird nest survey. If any active nests are located within the project area, project activities will not be permitted without written approval and monitoring by a BLM/FFO biologist.

4.22 Special Management Species

4.22.1 Direct and Indirect Effects

The action would not result in any direct effect on any Special Management Species or their nests or roosts. Increases in noise and activity is minimal and consistent with current activities in the area. The action is not in close proximity to any raptor nests. There is a temporary loss of potential foraging habitat for the Golden eagle, Ferruginous Hawk, Peregrine falcon, and Prairie falcon prior to rehabilitation and reseeding.

4.22.2 Potential Mitigation

Standard conditions of approval designed to protect wildlife and migratory birds would serve to protect Special Management Species (see Appendix 7.1). All construction activities are confined to permitted areas only. Rapid and permanent vegetation and cover reestablishment minimizes impacts to wildlife. All hazards associated with construction and operation of the action are fenced or contained in storage tanks.

4.23 Visual Resources

4.23.1 Direct and Indirect Effects

The action is located in an area designated a Class III VRM. The action is not be visible as a foreground or middle ground feature from any highway, county road, residence, or recreation area.

4.23.2 Potential Mitigation

New equipment on the action location is painted Juniper Green (Federal Standard 595a-17127) to blend with the natural color of the landscape.

4.24 Recreation

4.24.1 Direct and Indirect Effects

Construction, drilling, and production of the action would result in increased human activity, construction activity, and production activity and equipment in the area. Noise levels within the area would increase moderately during construction and drilling of the proposed well. Long-term increases in noise is low. Equipment and activities would also similarly increase visual disturbance in the immediate area with moderate short-term and low long-term effects. Noise and visual impacts is less noticeable as there are numerous existing gas and oil developments in the area. A potential indirect effect is the displacement of some wildlife species from the area surrounding the well location. This could detract from the recreational experience for those recreational visitors hoping to encounter such wildlife.

4.24.2 Potential Mitigation

The action is outside any designated recreation SDA in an area that is not readily used by recreationists or managed for recreational opportunities. The action is painted to help blend in with the surrounding scenery. Standard conditions of approval designed to protect wildlife and migratory birds would serve to limit effects to the activities of recreationally important animal species (see Appendix 7.1).

4.25 Public Health and Safety

4.25.1 Direct and Indirect Effects

The action area is located in a somewhat remote area rarely frequented by individuals not involved in the gas and oil industry. No residences are located within one mile of the action. Effects to public safety are low for the short and long-term and would include increase traffic risks, chemical spills, pipeline failures, and equipment accidents.

4.25.2 Potential Mitigation

The operator is responsible for the proper training and the health of its employees. Occupational Safety and Health Administration (OSHA) safety laws and regulations, BLM Notice to Lessee (NTL)-3A, pipeline safety regulations 49 CFR Parts 190 and 192, the Emergency Planning and Community Right to Know Act (1986), and CERCLA 1980, amongst other legislation, have been enacted to ensure the health and safety of workers and the public at large. A well location must have an informational sign, as directed under 43 CFR 3160.

5.0 Cumulative Impacts

The leased area of the 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 New Mexico, 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.

6.0 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 6.0 – Summary of Public Contacts Made During Preparation of Document and Interdisciplinary Team

Public Contact	Title	Organization	Present at Onsite?
ID Team Member	**Title**	**Organization**	**Present at Onsite?**
Steven "Craig" Willems	Environmental Protect. Spec.	BLM	NO
Kyla Vaughan	Regulatory Compliance	XTO Energy Inc.	YES
Scott Baxstrom	Construction Foreman	XTO Energy Inc.	YES
Tony Espinosa		XTO Energy Inc.	YES
Malia Villers	Regulatory Compliance	XTO Energy Inc.	YES
Brent Beaty	Construction Foreman	Rosenbaum	YES
Maria Adkins	Third Party Contractor	Adkins Consulting	NO
Keri Caraher	Third Party Contract	Adkins Consulting	NO
Jim Copeland	Cultural specialist	BLM	NO
John Hanson	Wildlife specialist	BLM	NO
John Kendall	T&E specialist	BLM	NO
Sarah Scott	Natural Resource specialist	BLM	NO
Jeff Tafoya	Range specialist	BLM	NO
Barney Wegener	Riparian specialist	BLM	NO
Dale Wirth	Hydrology specialist	BLM	NO

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7.0 Appendices

7.1 APDICOA

See attachment. The APD and COAs contain additional information about the action including maps of all facilities, roads, pipelines, power lines, etc.

7.2 Authorities

Code of Federal Regulations (CFR)
40 CFR All Parts and Sections inclusive Protection of Environment, Revised as of July 1, 2001.
43 CFR, All Parts and Sections inclusive - Public Lands: Interior. Revised as of October 1, 2000.

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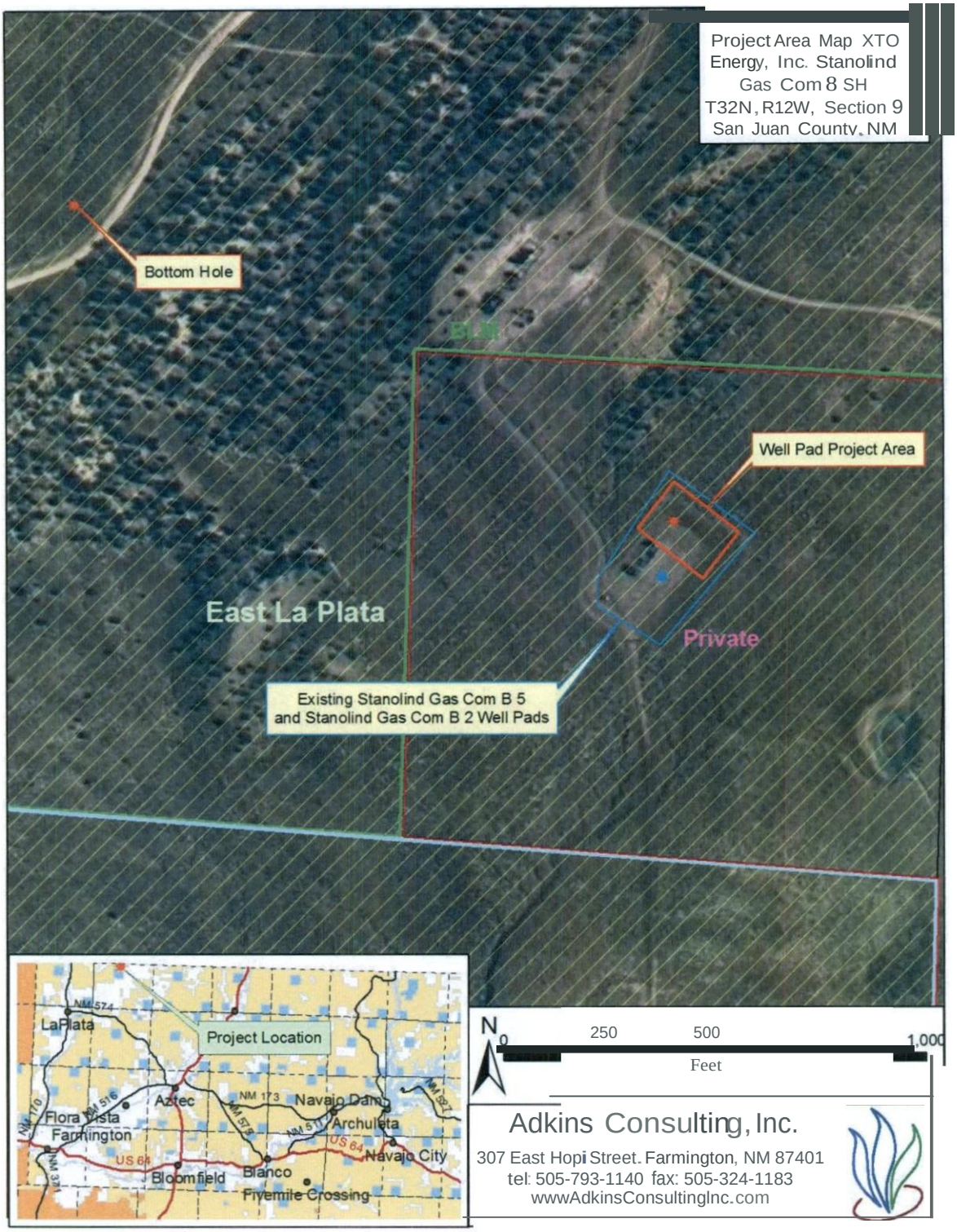
7.3 **Project Area Map**