BUREAU OF LAND MANAGEMENT
FARMINGTON FIELD OFFICE

ENVIRONMENTAL ASSESSMENT

FOR

Application for Permit to Drill the
Dugan Production Corporation

Federal B Com 91

Well Pad, Access Road and Well-tie Pipeline

Lease# NM-019411

NM- F010- 2011-224

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TABLE OF CONTENTS

	Page
1.0 Introduction	**1**
Purpose & Need	1
Conformance with Applicable Land Use Plan and Other Environmental Assessments	1
Federal, State or Local Permits, Licenses or Other Consultation Requirements	1
2.0 Alternatives Including the Proposed Action	**3**
Alternative A – No Action	3
Alternative B – Proposed Action	3
Alternative C – Alternative to the Proposed Action	4
Alternatives Considered But Not Analyzed in Detail	6
3.0 Description of Affected Environment	**7**
Air Resources	10
Areas of Critical Environmental Concern (ACECs)	12
Cultural Resources	12
American Indian Religious Concerns	12
Environmental Justice	13
Farmlands, Prime or Unique	13
Floodplains	13
Invasive, Non-native Species	13
Wastes, Hazardous or Solid	14
Water Quality- Surface/Ground	14
Wetland/Riparian Zones	15
General Topography/Surface Geology	15
Mineral Resources	15
Paleontology	15
Soils	15
Watershed – Hydrology	16
Vegetation, Forestry	16
Livestock Grazing	16
Wild Horse and Burros	16
Wildlife	16
Migratory Birds	17
Special Management Species	17
Visual Resources	19
Recreation	19
Public Health and Safety	19
4.0 Environmental Consequences and Proposed Mitigation Measures	**21**
Air Resources	22
Areas of Critical Environmental Concern (ACECs)	24
Cultural Resources	24
American Indian Religious Concerns	24
Environmental Justice	25
Farmlands, Prime or Unique	25
Floodplains	25
Invasive, Non-native Species	25
Wastes, Hazardous or Solid	25
Water Quality- Surface/Ground	26

Wetland/Riparian Zones 26
General Topography/Surface Geology 26
Mineral Resources 26
Paleontology 26
Soils 27
Watershed – Hydrology 27
Vegetation, Forestry 27
Livestock Grazing 28
Wild Horse and Burros 28
Wildlife 28
Migratory Birds 29
Special Management Species 30
Visual Resources 30
Recreation 30
Public Health and Safety 31

5.0 Cumulative Impacts **32**

6.0 Consultation/Coordination **33**

7.0 Appendices **36**
Action Area Map 37

1.0 Introduction

A representative of Dugan Production Corporation (Dugan) filed an Application for a Permit to Drill (APD) with the BLM for the Federal B Com 91 well pad, access road, and well-tie pipeline. The proposed project is located in the S/2 of Section 31, Township 30N, Range 11W, 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 leases are 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/s.

The Federal 8 Com 91 gas well would allow Dugan to develop their lease and provide additional natural gas for the national energy market, which would also generate federal and state tax revenue as well as revenue for Dugan.

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 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 (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, a 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.

Fal!}1ington Field Office staff reviewed the proposed action and determined it would be in COQ1pliance 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 these wells including water rights Jpropriations, the installation of water management facilities, water discharge permits, and relevant air quality permits.
- "ertify that a Surface Use Agreement has been reached with private landowners where required.

Well Pad	New Disturbance	105 x 150	*0.36	-	-	*Short/Long Term
	Existing Disturbance	-	-	105 x 150	*0.36	*Short/Long Term
Construction Zone	New Disturbance	706 x 50	0.82	-	-	Short Term
	Existing Disturbance	-	-	706 x 50	0.82	Short Term
Pipeline	New Disturbance	2141 x20	0.98	2120 x20	0.97	Short Term
	Existing Disturbance	2141 x 20	-	2120 x 20	-	
Access Road	New Disturbance	1290 x 30	**0.89**	-	-	**Long Term**
	Existing Disturbance			**1410 x 30**	**0.97**	**Long Term**
Total New Surface Disturbance			**3.05**		**0.97**	

2.0 Alternatives Including the Proposed Action

2.1 Alternative A - No Action

The BLM NEPA Handbook (H-1790-1) states that for Environmental Assessments (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 3162.3-1 (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 proposed action area. No mitigation measures would be required.

2.2 Alternative B – Proposed Action

Dugan proposes to construct a •.veil pad, access road, and well-tie pipeline in order to drill and develop federal minerals in the Fruitland Coal formation. Access to the proposed Federal B Com 91 well pad would be gained by traveling east on Main Street for 9.6 miles from Farmington, NM. Turn right on County Road 3500 and travel southerly for 3.0 miles. Turn left on County Road 3145 and travel for 0.6 miles. Turn left on County Road 3100 and travel for 1.3 miles. Turn right on County Road 3180 and travel for 0.9 miles. Turn left on County Road 3189 and travel for 0.1 miles to the proposed Federal B Com 91 staked access road. The proposed Federal B Com 91 staked well location will be 1290 feet west.

The proposed project is on federal land with federal minerals. Total new surface disturbance for the proposed project, before any reclamation, would be approximately 3.05 acres. Upon completion of interim and short term rehabilitation of the area, long term disturbance would be approximately 1.16 acres.

The proposed Federal B Com 91 well pad would be 105 feet by 150 feet with an additional 50 foot construction buffer zone around the perimeter of the well pad. The well pad would require 2.0 feet of cut on the north side of the location, and between 2.5 and 3.5 feet of fill on the southeast side of the location. The construction buffer zones may be used to stockpile topsoil or vegetative material that would be utilized later during reclamation. Production pits would be lined. Cut and fill slopes would be returned to the original contour upon reclamation. New surface disturbance from the proposed well location would be approximately 1.18 acres.

Runoff would be diverted around the well site. A diversion ditch would need to be constructed above the cut slope on the northwest side of the pad draining west such that storm water run-off would be diverted around the well pad.

The upgrade of an existing two-track dirt road would be required to access the proposed well. The completed access road would be 1290 feet in length with a clearing width of 30 feet and would be developed to BLM "Gold Book" standards. The proposed access road would result in approximately 0.89 acres of new surface disturbance.

Once the proposed Federal B Com 91 gas well is completed, a 2141 foot pipeline would be constructed parallel to the access road and parallel to an existing pipeline. The pipeline-tie would result in approximately 0.98 acres of new surface disturbance.

Construction of the well-tie pipeline would consist of using a brush-hog to remove vegetation for a 20 foot wide ROW. The pipeline trench would be dug with a rubber-tired backhoe. Pipe would be welded at staging point on the well-pad and pulled through the length of the ditch. The gas pipeline would be buried at least five feet deep and a 2-inch poly pipeline would be used. The gas pipe wall strength would be 160 pounds per square inch (PSI). This project would also include laying a 4-inch poly water pipeline within the same ROW, parallel to the gas pipeline. The trench would be backfilled with a rubber tired backhoe, re-contoured to original contours, and re-seeded as specified by the BLM or surface owner agreement.

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 would be 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. All above ground equipment would be painted Juniper Green to blend in with the surrounding tree cover.

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. 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.

›r a detailed description of design features and construction practices associated with the proposed action, refer to the D (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 determined at the onsite include:

- All pits would meet State of New Mexico, Oil Conservation Division (NMOCD) pit guidelines and requirements, NMAC 19.15.17. Pits would be lined with synthetic liner (minimum 20 mils thick).
- A tight sheep fence would be 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.
- Excavated materials from the cuts would be used on the fill portions of the location.
- Reclaimed slopes would 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 would be seeded with the standard seed mix.
- Above ground structures would be painted to blend with the natural color of the landscape. Paint color would be Juniper Green (Federal Standard 595a-17127).
- Additional culverts and silt traps for the access road and other necessary hydrologic BMPs would be installed as necessary for proper drainage and sediment management.
- All cultural resource stipulations would be follgwed.
- Low profile and low noise equipment would be used due to the site's proximity to a residential area.
- Mitigation measures instituted during the onsite inspection include: rerouting the access road and pipeline in order to utilize an existing two-track dirt road.

Table 2.2- Proposed Well Information

Well Name	Well Number	Township	Range	Section	Footages	Lease #	Lease Issue Date
Federal B Com	91	30N	11W	31	1355' FSL 2040' FWL	NM-019411	10/01/1955

County: San Juan

Applicant: Dugan Production Corporation

Surface Owner: Bureau of Land Management

2.3 **Alternative C**

Dugan proposes to construct a well pad, access road, and well-tie pipeline in order to drill and develop federal minerals in the Fruitland Coal formation (See description under Section 2.2 Alternative B). An alternative to the proposed action would be to utilize a plugged and abandoned well site, the Burlington Resources Oil and Gas (BROG) Federal *B* 001, located approximately 700 feet southwest of the Alternative B proposed well head.

The Alternative C surface location would be approximately 655' FSL & 1950' FWL of Section 31, T-30-N, R-11-W, in San Juan County, NM. The well would be directionally drilled with the bottom hole located approximately 1355' FSL & 2040' FWL of Section 31, T-30-N, R-11-W. Alternative Action C would be located on BLM lands and would develop federal minerals. Refer to maps in Section 7.3 for more detail.

Total new surface disturbance for the Alternative C proposed project before any reclamation would be approximately 0.97 acres. This would be 1.66 fewer acres of new surface disturbance than for Action Alternative B.

Upon completion of interim and short term rehabilitation of the Alternative C project area, long term disturbance would be approximately 1.24 acres. This would be 0.08 acres more long term disturbance than for Action Alternative B.

The Federal B Com 91 Alternative C well pad would be 105 feet by 150 feet with an additional 50' construction buffer zone on all four sides of the well pad. The well pad would require minimal site excavation in that it would utilize a plugged and abandoned well pad area. The proposed well pad would result in some soil disturbance but no new disturbance to surface vegetation.

Runoff would be diverted around the well site and existing diversions and culverts would be cleaned out and re-utilized.

Drilling the Federal B Com 91 Alternative C well from this location would require a drilling rig to directionally drill approximately 700 feet. Alternative C would be within the limits of offset range and technical capabilities of Dugan's directional drilling technologies.

Access to the Alternative C well pad would be gained using approximately 1410 feet of existing roadway. The surfacing and repair of deteriorated sections of the existing access road may be required. Culverts 24" minimum in diameter may be placed at the entrance of the well location, at the proposed access road take-off, in low areas where necessary and according to "Gold Book" standards. There would be no new surface disturbance associated with the Alternative C access road.

An associated pipeline, approximately 2120 feet in length, would be constructed connecting the proposed Federal B Com 91 Alternative C well to an existing Dugan pipeline. This pipeline would be constructed parallel to the existing access road, resulting in approximately 0.97 acres of new surface disturbance.

Construction techniques, production equipment, and BMP's for Action Alternative C would be the same as described for Action Alternative B, except where noted above in this section.

For a detailed description of design features and construction practices associated with the proposed action, refer to the APD (attached as Appendix 7.1). Also see the subject APD for additional maps showing the proposed well locations 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 determined at the onsite include:

- All pits would meet State of New Mexico, Oil Conservation Division (NMOCD) pit guidelines and requirements, NMAC 19.15.17. Pits would be lined with synthetic liner (minimum 20 mils thick).
- A tight sheep fence would be 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.
- Excavated materials from the cuts would be used on the fill portions of the location.
- Reclaimed slopes would 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 would be seeded with the Standard seed mixture.
- Above ground structures would be painted to blend with the natural color of the landscape. Paint color would be Juniper Green (Federal Standard 595a-17127).
- Additional culverts and silt traps for the access road and other necessary hydrologic BMPs would be installed as necessary for proper drainage and sediment management.
- All cultural resource stipulations would be followed.
- Low profile and low noise equipment would be used due to the site's proximity to a residential area.

Table 2.3 Alternative Well Info rm

Federal B Com	91	30N	11W	31	Surface Hole: 655' FSL 1950' FWL Bottom Hole: 1355' FSL 2040' FWL	NM-019411	10/01/1955

County: San Juan

Applicant: Dugan Production Corporation

Surface Owner: Bureau of Land Management

2.4 Alternatives Considered But Not Analyzed

No additional alternatives were considered for the Federal B Com 91.

3.0 Description of Affected Environment

This section describes the environment that would be affected by implementation of the Proposed Action 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 Tables 3.1 and 3.2. Following the tables, only the aspects of the affected environment that are potentially impacted are described.

Table 3.1-Alternative 8 Affected Environment and Basis for Determination No Further Analysis

CRITICAL ELEMENTS OF THE HUMAN ENVIRONMENT				
Air Resources	X		X	
Areas of Critical Environmental Concern		X	X	
Cultural Resources		X	X	(Report No. CASA11-27)
Native American Religious Concerns		X		A review of existing information indicates the project is not associated with any known Traditional Cultural Property.
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 BLM/FFO Area, no indirect effects are projected outside the BLM/FFO Area.
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				
)pography/Surface ;eology	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	The proposed action is located within the BLM/FFO special management area for the BLM Sensitive and State of New Mexico Endangered Brack's hardwall cactus *(Sclerocactus c/overiae ssp brackit)* and Aztec gilia *(Aiiciella formosa);* Nacimiento Formation, which provides the appropriate geologic substrate for the Brack's hardwall cactus *(Sclerocactus c/overiae ssp brackit)* and Aztec gilia *(Aiiciella formosa),* does occur throughout the proposed project area. Neither of these species were observed during the biological field survey of the project area.
Wildlife	X		X	
'/ild Horse and Burros		X	X	
ecreation			X	
X Visual Resources			X	
X Public Health and Safety			X	
X				

Table 3.2 – **Alternative C** Affected Environment and Basis for Determination No Further Analysis

CRITICAL ELEMENTS OF THE HUMAN ENVIRONMENT

Air Resources	X		X	
Areas of Critical Environmental Concern		X	X	

Cultural Resources			X	A Cultural Resources Survey has not been completed for Action Alternative C.

Native American Religious Concerns		X		A review of existing information indicates the project is not associated with any known Traditional Cultural Property.
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 BLM/FFO Area, no indirect effects are projected outside the BLM/FFO Area.
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	The proposed action is located within the BLM/FFO special management area for the BLM Sensitive and State of New Mexico Endangered Brack's hardwall cactus (*Sc/erocactus cloveriae ssp brackil)* and Aztec--gilia *(Aiiciel/a formosa)*; Nacimiento Formation, which provides the appropriate geologic substrate for the Brack's hardwall cactus (*Sclerocactus cloveriae ssp brackit)* and Aztec gilia *(Aiiciella formosa)*, does occur throughout the proposed project area. A Biological Survey has not been completed for Action Alternative

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				C.
1Wildlife	X		X	
Wild Horse and Burros		X	X	
Recreation		X	X	
Visual Resources	X		X	
Public Health and Safety		X	X	

3.1 Air Resources

The proposed action alternatives are 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/Environmental Impact 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 (CO_2), methane (CH_4), nitrous oxide (N_2O), water vapor (H_2O), 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 Rockies, 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 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 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 alternatives 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 wells 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 transportation 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, San Juan County is classified as in attainment with the revised federal ozone standard of 0.075 ppm. Rio Arriba County is unclassified because there are no ozone monitors sited in Rio Arriba County.

Greenhouse gases, including carbon dioxide (CO_2) and methane (CH_4), 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 CO_2 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 resourceuses." Iris not, however;-possible to predict with any certainty regionarorsire specific effectsonclimate 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.

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 =LPMA of 1976 allowing for multiple use of lands administered by the BLM. The ACEC designation pertains to "…areas "thin public lands where special management attention is required (when such areas are developed or used or where no velopment 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 alternatives would not be located in any BLM/FFO designated Areas of Critical Environmental Concern (ACECs).

3.3 Cultural Resources

The proposed action alternatives (Alternative B and C) are 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: Paleo-Indian (ca. 10000 B.C. to 5500 B.C.), Archaic (ca. 5500 B.C. to A.D. 400), Basketmaker 11-111 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 document, 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 proposed Action Alternative B is located within the Animas watershed. Based on the CRTR (SAIC 2002) a total of 965 sites representing 1376 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 Ute and historic Pueblo occupations. The most frequently occurring cultural affiliations recorded are Anasazi and proto-historic Navajo. Features common to these sites include artifact scatters, pueblos, pit houses, hogans, and veat lodges.

The proposed Action Alternative Cis located within the Upper San Juan Watershed. Based on the CRTR (SAIC 2002) a total of 3,009 sites representing 18 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 disproportionately unknown components whose content is not well understood, or historic Navajo Reservation period components. Features common to these sites include simple artifact scatters, pueblitos, hogans, corrals, and sweat lodges.

The entire area of potential affect for the Proposed Action Alternative B was surveyed by Complete Archaeological Services (CASA) at a BLM Class Ill level (100%) and inventory reports were prepared and submitted to the BLM in accordance with the *Procedures for Performing Cultural Resources Fieldwork on Public Lands in the Area of New Mexico BLM Responsibilities* (BLM 2005).

No cultural sites were located for the Federal Com 91 Alternative B action area (Report No. CASA-11-27; BLM 2009(11)091F).

No cultural resourcesJnventory has been conducted for Alternative C. If Alternative C was developed, a leveiil inventory would need to be conducted prior to any construction activities. If as a result of the inventory it was determined that cultural or historic sites would be damaged or disturbed, then Alternative C, in its present form, would cease to be a viable alternative.

3.4 American Indian Religious Concerns

Traditional Cultural Properties (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 patrimo_ny
- 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 action alternatives, 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.

A review of existing information compiled during previous land use planning efforts, existing studies, or via direct consultation indicates the action alternatives are not within a known Traditional Cultural Property.

3.5 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 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 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 alternatives would not be located within any soil units known to contain prime or unique farmlands (BLM 2003a, pg 3-22).

3.7 Floodplains

Field inspection of the action area alternatives and a review of the GIS data on active and 100-year floodplains (derived from Federal Emergency Management Agency floodplain maps) indicate the action alternatives are 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 would be required to prevent the reduction or spread of noxious weeds, including requirements for using weed seed-free hay, mulch and straw.

No invasive or noxious weeds were encountered during the onsite inspections of the proposed Action Alternative B. Field inspection of the Alternative C location has not been made. Potential exists for non-native weeds to be present on the plugged and abandoned well pad where the Alternative C pad would be located. BLM GIS data of known invasive or noxious weed populations indicate no known weed populations to be in or nearby the area of the action alternatives.

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. In 1980, an 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 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 Alternative B site. No such waste is expected to exist at the Alternative C location. 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 either action alternative. Action Alternative B generally drains into Jones Arroyo. Jones Arroyo flows into the Animas River (perennial) 3.1 miles northwest. Action Alternative C generally drains south through a series of unnamed tributaries to the San Juan River (perennial) 6.0 miles southwest.

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 proposes to set surface casing to a depth of 120 feet, or as specified by the BLM, to protect any shallow aquifers. An operation plan with the proposed casing program to protect the aquifers would be submitted with the APD.

3.11 Wetlands/Riparian Zones

Field inspection of the proposed action areas site and a review of BLM and USFWS GIS data indicate the action alternatives are not located within any riparian or wetlands habitat.

3.12 General Topography/Surface Geology

The proposed action alternatives are located on Crouch Mesa. Alternative B is located on a low rise between two drainages. Alternative C is located on a gently sloping, south facing hillside. Local topography of both action alternatives consists of mesa top terrain with ephemeral washes and low hills throughout. Elevation in the immediate area of the action alternatives ranges from 5871 to 5780 feet.

3.13 MineralResources

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 alternatives are 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 proposed project areas are located within the paleontological rich area of the San Juan Basin of northern New Mexico.

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

3.15 Soils

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.

The soil type in the immediate area of both action alternatives is Gypsiorthids-Badland-Stumble complex, 5 to 30 percent slopes. This soil complex typically occurs on hills, breaks and ridges. These soils are deep and somewhat excessively drained with slow to rapid permeability. Typically the surface layer is a mix of pale yellow sandy loam, barren shale uplands and yellowish gray loamy sand between 4 to 8 inches thick.

Table 3.15.1

Type	Sandy loam	Barren shale	Loamy sand
Slope	5-30%	5-30%	5-15%

Depth	Deep	0-2"	Very Deep
Surface Runoff	-	High	Low
Water Erosion	Low	Low	Low
Soil Blowing	-	Low	Moderate
Drainage Class	Well Drained	Somewhat Excessively Drained	Somewhat Excessively Drained
Available Water Cap.	Very Low	-	Low
Permeability	Low to Moderately High	Very Low	Rapid
Parent Material	Gypsum	Shale	Sandstone

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. Action Alternative B is within the Animas Watershed, and Action Alternative C is within the Upper San Juan Watershed

3.17 Vegetation, Forestry

Both action alternatives on and juniper woodland and desert scrubland vegetation community. The areas support on and juniper tree growth with understory including sagebrush, snakeweed, galleta grass, and Indian ricegrass. Action Alternative B would result in the removal of 40-60 pinon and juniper trees. Action Alternative C has little vegetative growth due to previous mechanical clearing. Action Alternative C would require 'e removal of 5-10 trees along the proposed pipeline ROW.

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 additional30 section 15 authorizations that permit grazing on 30 allotments in the Lindrith, NM area.

The action alternatives are located within the Crouch Mesa Allotment #5028. The grazing allotment is operated from November 20 through April 20 annually with a maximum of 906 head of sheep. This allotment consists of 89% public land.

3.19 Wild Horse and Burros

There are no areas managed for wild horse or burros within the proposed action areas. The action alternatives lie 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 areas.

3.20 Wildlife

Mule deer may be found in the area of the action alternatives in addition to 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 nee-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 Action Alternative B at the time of field inspections. A biological field inspection was not performed for Action Alternative C. Common reptile species that could be present are the eastern fence lizard and the short-horned lizard.

The action alternatives are not located within any BLM/FFO SDA.

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 areas.

The Action Alternatives would require less than 4.0 acres of vegetative disturbance; therefore, no timing stipulations would apply.

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.
Gray vireo *(Vireo vicinior)*	Found in desert scrub, mixed juniper or pinon pine and oak scrub associations, and chaparral, in hot, arid mountains and high plains scrubland.
Gray flycatcher *(Empidonax wrightii)*	Prefers open pinon-juniper forest, often with interspersed ponderosa, with an understory of shrubs.
Juniper titmouse *(Baeo/ophus ridgwayi)*	Warm, dry open woodland, especially juniper woodlands.
Pinon jay *(Gymnorhinus cyanocephalus)*	Found in pinon-juniper woodland, sagebrush, scrub oak, and chaparral communities, and sometimes in pine forests.
Cassin's kingbird *(Tyrannus vociferans)*	Found in open country with scattered trees or open woodlands including pinon-juniper.

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 areas are listed in Table 3.22.

Table 3.22- Special Management Species of the BLM/FFO and their potential to occur in the proposed action areas.

Common Name (Scje(ltifi.g nflme)	Status*	Habitat Associations	Presence**
BIRDS			
American peregrine falcon *(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 regalis)*	SMS	Breed in open country, usually prairies, plains and badlands; semi-desert 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	Forage in open grassland, desert scrub, rangeland, agricultural; nest in cavities, ledges, on cliffs, trees, and power structures.	NS
Yellow-billed cuckoo *(Coccyzus americanus)*	SMS C	Breeds in riparian woodlands with dense, understory vegetation.	NP
PLANTS			
rack's hardwall cactus *clerocactus cloveriae ssp rackii)*	SMS NM-E	Sandy clay of the Nacimiento Formation in sparse shadscale scrub {5,000-6,000 ft.)	NS
Aztec gilia *(Aiiciel/a formosa)*	SMS NM-E	Salt desert scrub communities in soils of the Nacimiento Formation {5,000-6,000 ft).	NS
Sources: BLM 2008, New Mexico Natural Heritage Program 2005, NM Rare Plant 1999, USFWS *2007*			

Status*	Presence**
SMS = BLM Special Management Species C = Federal Candidate NM-E = State of NM Endangered NM-T =State of NM Threatened	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.

Of the ten (10) BLM/FFO SMS listed above, six (6) have the potential to occur in the area of both action alternatives.

The action alternatives provide potential foraging habitat for the American peregrine falcon, prairie falcon, golden eagle, and ferruginous hawk. No birds of prey orsigns of..lheir.pr:esence were observed during onsite inspection..of.Action Alternative B. A biological field inspection was not done for Action Alternative C; however, the area was inspected with binoculars during the biological field inspection of Action Alternative B.

The action alternatives would be located in the BLM/FFO special management area for the Brack's hardwall cactus and Aztec gilia. The proposed Action Alternative B area has been surveyed for the presence or potential presence of threatened, endangered, and BLM/FFO special management species (see Biological Survey Report on file at the BLM/FFO). Nacimiento formation soils are present in the area of both action alternatives to support Brack's hardwall

cactus and Aztec gilia, however, Alternative B would result in the loss of significantly more suitable habitat for these species than Alternative C. Approximately 2.46 acres of direct suitable habitat loss would result from Alternative B. Approximately 0.23 acres of marginal habitat loss would result from Alternative C (See table below). No Brack's hardwall cactus or Aztec gilia were observed during the field survey of Action Alternative B. A field survey was not conducted for Action Alternative C.

Comparison of Action Alternatives and Brack's Cactus and Aztec Gilia Habitat Disturban c

Well Pad	Direct Suitable Habitat Loss	105 x 150	1.18	105 x 150 (within existing disturbance)	0
Construction Zone	Direct Suitable Habitat Loss	706 x 50	0.82	-	0
Pipeline	Direct Suitable Habitat Loss	500 x 20	0.23	500 x 20	0.23
Access Road	Direct Suitable Habitat Loss	500 x 20 (excludes existing disturbance)	0.23	-	0
Total Direct Habitat Loss			2.46		0.23

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 alternatives are located in an area designated by the BLM/FFO as VRM Class IV. Management objectives for Class IV designation provide for management activities that require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements. (BLM 2003b:2-10).

3.24 Recreation

The Fannington Field Office has set aside several areas for special use and manages them as Specially Designated Areas (SDA). Recreation SDA's are managed to accommodate a large variety of recreational uses and outdoor recreational experiences. Areas located outside of recreation SDAs are managed as Extensive Recreation Management Areas (ERMAs). Few recreation facilities or supervisory efforts exist on these lands and they are managed to maintain a freedom of recreation choice with limited regulatory constraints. The proposed action area would not be in a SDA for recreation. Recreation in the area may include occasional hunting, hiking or wildlife viewing use.

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 b epor:ted to the BLM under tbe..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, ""Utside the facility site is required under the Comprehensive Environmental Response Compensation and Liability Act, J80 (CERCLA) and under BLM NTL-3A. The well locations must have an informational sign, as directed under 43 CFR 60.

Additional hazards to the general public in the action alternative areas include safety hazards associated with increased traffic during the construction of the proposed or alternative wells. 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 alternatives. Hydrogen sulfide gas is not known to be or expected to be a problem within the action alternatives.

4.0 Environmental Consequences and Proposed Mitigation Measures

No Action

Under the No Action Alternative, the proposed wells would not be drilled. There would be 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.

Proposed Action Alternatives

A summary of potential surface disturbances is presented in the following tables. Descriptions of potential effects on individual resources for the proposed action alternatives 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 4.0.1 – Summary of Disturbance

Well Pad	New Disturbance	105 x 150	*0.36	-	-	*Short/Long Term
	Existing Disturbance	-	-	105 x 150	*0.36	*Short/Long Term
Construction Zone	New Disturbance	706 x 50	0.82	-	-	Short Term
	Existing Disturbance	-	-	706 x 50	0.82	Short Term
Pipeline	New Disturbance	2141 x20	0.98	2120x20	0.97	Short Term
	Existing Disturbance	2141 x 20	-	2120 x 20	-	
Access Road	New Disturbance	1290 x 30	0.89	-	-	Long Term
	Existing Disturbance			1410 x 30	0.97	Long Term
Total Long Term Disturbance			1.16		1.24	Long Term
Total New Surface Disturbance			3.05		0.97	Short/Long Term

*All well pads will have interim reclamation. The average long term disturbance for a Dugan well pad for this formation is approximately 0.27 acres (see associated Surface Use Plan).

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 would temporary 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 roads, well pads, and by the drilling rigs that will be used to drill the wells. Dust dissemination would discontinue upon completion of the construction phase of the access roads and well pads. 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 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 would be drilled annually for federal minerals. Current APD permitting trends within the field office confirm that these "lssumptions are still accurate. This level of exploration and production would contribute a small incremental increase in *1erall* hydrocarbon emissions, including GHGs, NOx, and VOCs released into the planet's atmosphere. When compared total national or global emissions, the amount released as a result of potential production from the proposed wells 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 wells 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 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 proposed actions 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 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 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 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 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 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 compressor engines 300 horsepower or less must have NOx emissions limited to 2 grams per horsepower hour; re-vegetate 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 alternatives.

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

'lo effect.

.3 Cultural Resources

4.3.1 Direct and Indirect Effects

Direct effects nonnally include alterations to the physical integrity of a cultural resource. If a cultural resource is significant for other than its scientific infonnation, direct effects may also include the introduction of audible, atmospheric, or visual elements that are out of character for the cultural site. A potential indirect effect from the action alternatives is the increase in human activity or access to the area with the increased potential of unauthorized removal or other alteration to cultural resources in the area.

Based on a review of the archaeological reports and the assessment of the undertaking in this area, the BLM cultural resources staff has detennined that the proposed Action Alternative 8 will have no effect on cultural resources. This detennination will be included with the FFO/BLM cultural resources stipulations, if any, attached to the APD/R-0-W, as the case may be.

No cultural resources inventory has been conducted for Alternative C. If Alternative C was developed, a level III inventory would need to be conducted prior to any construction activities. If as a result of the inventory it was determined that cultural or historic sites would be damaged or disturbed, then Alternative C, in its present fonn, would cease to be a viable alternative.

4.3.2 Potential Mitigation

All FFO/BLM cultural resources stipulations will be followed as indicated in the Cultural Resource Records of Review, attached to the R-0-W/APD. These stipulations may include, but are not limited to temporary or permanent fencing or other physical barriers, monitoring of earth disturbing construction, project area reduction and/or specific construction 'Oidance zones, and employee education. All employees, contractors, and sub-contractors of the project will be *ionned* by the project proponent that cultural sites are to be avoided by all personnel, personal vehicles, and company equipment, and that it is illegal to collect, damage, or disturb cultural resources, and that such activities are punishable by criminal and or administrative penalties under the provisions of the Archaeological Resources Protection Act (16 U.S.C. 470aa-mm).

No further work to protect cultural resources on the Federal 8 Com 91 action area is required (CASA 11-27; BLM 2009(11)054F).

If selected, Alternative C would be surveyed for cultural resources prior to any construction. Mitigation strategies may be required to protect sites adjacent to the action area. If mitigation strategies are not sufficient to protect cultural resources discovered, then Alternative C would be abandoned as a viable alternative.

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 alternatives are 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.

4.5 Environmental Justice

4.5.1 Direct and Indirect Effects

No minority or low income populations would be directly affected in the vicinity of the action alternatives. 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 Inva ive, 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 would follow BLM policy to control and manage invasive nonnative vegetation species. There were no invasive weeds encountered during the onsite inspection of the action alternatives.

4.8.2 Potential Mitigation

It would be the responsibility of the operator to control and eradicate all noxious/invasive weeds within the project areas during the life of the projects.

4.9 Wastes, Hazardous or Solid

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

When significant amounts of chemicals are stored on-site, governmental agencies would 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 sites are required under the Comprehensive Environmental Response Compensation and Liability Act, 1980 (CERCLA) and under BLM NTL-3A. The well locations 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

here are no perennial water sources, springs, seeps, wetlands or well defined ephemeral drainages within the action alternative areas. Effects to ground water resources would be 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 GOA's, would be used to stabilize and reduce sediment flow. The Operator would be 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 would be 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

Although there will be surface disturbance for all projects, interim reclamation and reseeding is incorporated into the project for site mitigation. All projects would incorporate interim reclamation and the average long-term disturbance for a typical natural gas well project has been calculated as 0.75 acres. No prominent topographical features would be removed or disturbed by the action alternatives.

'.13 Mineral Resources

o effect.

4.14 Paleontology

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

4.14.1 Direct and Indirect Effects

Although no paleontological resources are known to occur within the action alternatives, 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. 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. P-otential impacts to paleontological resources as a result of the action alternatiYes would bellow and loog-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 would be soil disturbance at the action alternative locations. All areas to be disturbed would be bladed as needed to create flat surfaces for operating equipment and vehicles. Depth of soil disturbance would increase with rougher topography. Available topsoil would be stockpiled for reclamation. The cut and fill slopes on the action alternatives would be especially susceptible to wind and water erosion until vegetation has been reestablished (one to two growing seasons). The potential impacts would be dependent, 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 would likely be low to moderate for the action alternatives.

4.15.2 Potential Mitigation

The following mitigation would apply to the chosen action alternative: 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 would be 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 would be reclaime l.

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 alternatives 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 alternatives would disturb less than five (5) acres individually; currently, a Storm Water Pollution Prevention Plan for the Environmental Protection Agency (EPA) under the Clean Water Act would not be required.

The Operator would be 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 alternatives would not cross any ephemeral washes or impact any other waters of the United States; 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 would be constructed for the action alternatives. The diversions would be directed such that water would drain away and/or around the proposed well pads. Culverts would be installed where needed to maintain drainages along access roads (see attached COA's).

4.17 Vegetation, Forestry

4.17.1 Direct and Indirect Effects

Direct impacts would be the removal of trees, shrubs, and grasses to construct the well pads, access roads, and pipelines for the action alternatives. The Alternative B action would remove approximately 3.05 acres of established vegetation and would result in the removal of approximately 40-60 trees. The Alternative C action would remove approximately 0.97 -:res of established vegetation and would result in the removal of approximately 5-10 trees. Indirect impacts would be the ;maining long-term (20-30 years) disturbance of the well locations 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 project area and throughout the San Juan Basin.

4.17.2 PotentialMitigation

Under the action alternatives, upon completion of the construction, drilling, and the well being placed into service, the rehabilitation and reseeding of the unused portion of the well pads and pipelines would occur. Following interim reclamation, total long-term disturbance for the proposed Alternative 8 action would be approximately 1.16 acres, and for the Alternative C action, long-term disturbance would be approximately 1.24 acres. Those surfaces used for production equipment and vehicle travel would be reclaimed as directed by the conditions of approval (COA's) after final abandonment of the well.

4.18 Livestock Grazing

4.18.1 Direct and Indirect Effects

The action alternatives are located within the Crouch Mesa Allotment #5028. The grazing allotment is operated from November 20 through April 20 annually with a maximum of 906 head of sheep. This allotment consists of 89% public land.

Under the Alternative 8 action there would be a temporary loss of 3.05 acres prior to rehabilitation and reseeding. Under the Alternative C action there would be a temporary loss of 0.97 acres prior to rehabilitation and reseeding. There would be no reduction in AUMs under the action alternatives per typical BLM grazing allowances.

4.18.2 PotentialMitigation

itigation measures associated with soils, water, riparian and wildlife serve to lessen impacts to the rangeland omponents essential for rangeland health. Under the action alternatives, upon the completion of the construction, drilling, and the well being placed into service, the rehabilitation and reseeding of the unused portion of the well pads and pipelines would occur. Those surfaces used for production equipment and vehicle travel would be reclaimed as directed by the conditions of approval (GOA's) after final abandonment of the well. Following site reclamation, long-term project disturbance would be approximately 1.16 acres and 1.24 acres, for Alternative 8 and Alternative C, respectively; there would be no reduction in AUMs under either Alternative.

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, blacl<tailed jackrabbit, mule deer, coyote, and other species that typically utilize such habitat.

The Alternative 8 action would remove 3.05 acres and the Alternative C action would remove 0.97 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). For wildlife use, the habitat in the project

area is not unique to the planning area and is common throughout the northern half of the planning area. Effects to wildlife would be 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 would be 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 alternatives would be fenced or contained in storage tanks.

Following site reclamation, long term habitat disturbance would equal approximately 1.16 acres under Alternative B and 1.24 acres under Alternative C.

4.21 Migratory Birds

4.21.1 Direct and Indirect Effects

Adult migratory birds would not be directly harmed by the action alternatives because of their mobility and ability to avoid areas of human activity. Any nests within the area of the action alternatives may be directly impacted, along with eggs and juveniles. No old nests left from the previous breeding season or other evidence of these species was detected during the onsite inspections of the action alternatives. 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 alternative areas. 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 would be low short-term effects to migratory birds, and minimal long-term effects as a result of the action alternatives.

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. Bird species may lose nesting/burrow habitat and foraging habitat.

The Alternative B action would temporarily remove 3.05 acres and the Alternative C action would temporarily remove 0.97 acres of potential 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 would be 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 alternatives would be fenced or contained in storage tanks.

Best Management Practices (BMPs) would be 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). Both action alternative disturbance totals would be less than 4.0 acres of vegetative disturbance; therefore, no construction timing stipulations would apply to either alternative. Following site reclamation, long term habitat disturbance would equal approximately 1.16 acres under Alternative B and 1.24 acres under Alternative C.

4.22 Special Management Species

4.22.1 Direct and Indirect Effects

he action alternatives provide potential foraging habitat for the American peregrine falcon, Prairie falcon, Golden eagle, and Ferruginous hawk. There would be a temporary loss of potential foraging habitat for the four raptor species prior to rehabilitation and reseeding.

The proposed action alternatives are located within the BLM/FFO special management area for the BLM Sensitive and State of New Mexico Endangered Brack's hardwall cactus and Aztec gilia. Nacimiento Fonnation, which provides the appropriate geologic substrate for the Brack's hardwall cactus and Aztec gilia, does occur throughout the project area of both action alternatives. Suitable habitat for these two species occurs within Action Alternative B where marginal habitat occurs within Alternative C. Alternative B would result in 2.46 acres of direct suitable habitat loss for Brack's hardwall cactus and Aztec gilia. Alternative C would remove approximately 0.23 acres of marginal habitat for these two species. Neither of these species was found during the biological survey of Action Alternative B. A biological survey was not conducted for Action Alternative C.

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 would be 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 alternatives would be fenced or contained in storage tanks.

4.23 Visual Resources

4.23.1 Direct and Indirect Effects

The action alternatives would be located in an area designated a Class IV VRM. The action alternatives would be visible as a foreground or middle ground feature from San Juan County Road 3183 and from a residential area.

4.23.2 Potential Mitigation

New and old equipment on the action alternatives would be painted Juniper Green (Federal Standard 595a-17127) to mimic the vertical elements of the adjacent vegetation. The equipment would be low profile to blend in with the surrounding topography.

4.24 Recreation

4.24.1 Direct and Indirect Effects

Construction, drilling, and production of the action alternatives 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 wells. Long-tenn increases in noise would be low. Equipment and activities would also similarly increase visual disturbance in the immediate area with moderate short-tenn and low long-tenn effects. Noise and visual impacts would be less noticeable as there are numerous existing gas and oil developments in the area. A potential indirect effect would be the displacement of some wildlife or plant species from the area surrounding the well locations. This could detract from the recreational experience for recreational visitors hoping to encounter such wildlife.

4.24.2 Potential Mitigation

Equipment on the action alternatives would be painted Juniper Green (Federal Standard 595a-17127) to help blend in with the surrounding scenery. The equipment would be low profile and low noise to blend in with the surrounding topography and limit disruptive noise. 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

Residences are located within one mile of the action alternatives. Effects to public safety would be 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. All well locations must have an informational sign, as directed under 43 CFR 3160.

5.0 Cumulative Impacts

The leased area of the action alternatives has been industrialized with oil and gas well development. The surface 'iturbance for each project that has been permitted has created a spreading out of land use fragmentation. The mulative 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 these wells may contribute to GHG emissions.

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

Due to loss of habitat or competition from other species whose ranges may shift northward, the population of some animal species may be reduced or increased. Less snow at lower elevations would likely impact the timing and quantity of snowmelt, which, in turn, could impact water resources and species dependent on historic water conditions. Forests at higher elevations in New Mexico, for example, have been exposed to warmer and drier conditions over a 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?**
Craig Willems	Environmental Protect. Spec.	BLM	YES
Scott Hall	ROW Specialist	BLM	YES
Kurt Fagrelius	Vice President, Exploration	Dugan Production Corp	YES
Maria Adkins	Third Party Contractor	Adkins Consulting Inc.	YES
Matt Zabka	Third Party Contractor	Adkins Consulting Inc.	NO
Lori Gregory	Third Party Contractor	Adkins Consulting Inc.	NO
Jim Copeland	Cultural specialist	BLM	NO
John Hanson	Wildlife specialist	BLM	NO
John Kendall	T&E specialist	BLM	YES
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 APD/COA

"ee attachment. The APD and COAs contain additional information about the proposed action including maps of all JCilities, 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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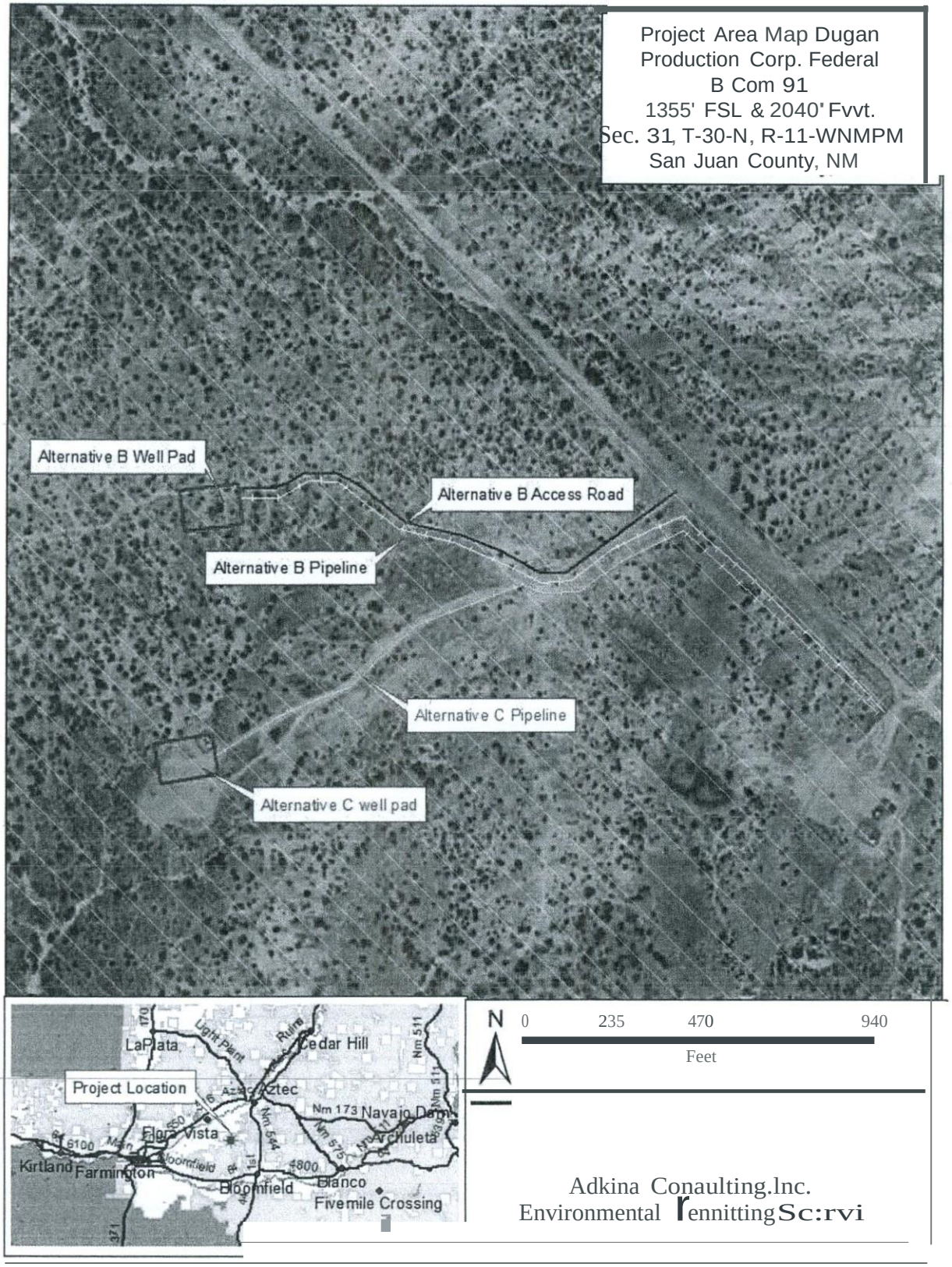
7.3 Action Area Map



BIOLOGICAL SURVEY REPORT

For the Proposed:

federal B Com 91
Well Pad, Access Road and Well-tie Pipeline

Sponsored by:

Dugan Production Corporation
Farmington, New Mexico

Prepared by:

Adkins Consulting, Inc.
Farmington, New Mexico

April 2011

TABLE OF CONTENTS

Page

Introduction 1

Project Description 1

Methodology 1

Action Area 2

Survey Results 3

Discussion 4

Certification 5

Literature Cited 6

Tables

Table 1: Species listed by the USFWS 7

Table 2: BLM/FFO special management species 8

Appendices

A - Project Area Map

B - Survey Plats of Project Area

C - Photograph of Survey Area

D - Plants and Wildlife Observed in Action Area

INTRODUCTION

This report describes the potential for federal, State of New Mexico and Bureau of Land Management (BLM) listed threatened, endangered, candidate, and other designated sensitive flora and fauna species to occur within the proposed action area. The BLM defines the action area as any area that may be directly or indirectly impacted by the proposed action. This report is prepared in accordance with the BLM/FFO's biological survey guidelines and is intended to provide the agency with information to make determinations of effect on species with special conservation status.

PROJECT DESCRIPTION

Location

The project proposed by Dugan Production Corporation, the Federal B Com 91, is a single gas well located on federal lands with federal minerals administered by the BLM/FFO. More specifically the proposed action would be located:

SW/2 of Section 31, T30-N, R11-W,
New Mexico Principal Meridian, San
Juan County, New Mexico.

A project area map showing the location of the proposed action on the Flora Vista, New Mexico, 7.5 Minute U.S. Geological Survey Quadrangle is provided in Appendix A. The proposed project is located approximately 4.5 miles southwest of Aztec, New Mexico, 3.0 miles west of Hwy 550, 4.2 miles north of U. S. Hwy 64, and 2.9 miles southeast of the Animas River. The GPS coordinates at the proposed wellhead are:

UTM Zone 12S
Easting 0764761
Northing 4072941
Datum NAD 83

Disturbance

The proposed Federal B Com 9 well pad would be 105 feet by 150 feet with an additional 50 foot construction buffer zone around the perimeter of the well pad. Well pad construction would result in approximately 1.18 acres of new surface disturbance.

The upgrade of an existing two-track dirt road would be required to access the proposed well. The completed access road would be 1290 feet in length with a clearing width of 30 feet. The proposed access road would result in approximately 0.89 acres of new surface disturbance.

Once the proposed Federal B Com 91 gas well is completed, a 2141foot pipeline would be constructed parallel to the access road and an existing pipeline. The pipeline-tie would result in approximately 0.98 acres of new surface disturbance.

The purpose of this project is to provide energy resources, enhance natural gas production in the surrounding area, and generate revenue r Dugan Production Corporation.

METHODOLOGY

Off-site Methods

Prior to conducting fieldwork, Adkins Consulting compiled a list of federally listed, State of New Mexico Department of Game and Fish sensitive species, and BLM Special Management Species (SMS) with potential to occur in San Juan County. Federally listed species were obtained from the U.S. Fish and Wildlife Service (http://ifw2es.fws.gov/EndangeredSpecies/lists/ListSpecies.cfm) Southwest Region

endangered species list. State of New Mexico sensitive fauna were compiled from the New Mexico Department of Game and Fish and the New Mexico Natural Heritage Program (http://nmnhp.unm.edu/bisonm/bisonquery.php). State of New Mexico sensitive flora was compiled from the 1999 New Mexico Rare Plant Technical Council (http://nmrareplants.unm.edu). Additional BLM SMS were determined by the BLM Farmington Field Office (BLM/FFO).

Survey Methods

An on-site pedestrian survey of the proposed Federal B Com 91 project area was conducted on 16 February 2011between 1100-hrs and 1220-hrs. The survey consisted of walking transects for the perimeter of the proposed well pad, including construction zones, access road, and pipeline-tie ROW. The surrounding areas were visually inspected with binoculars for nests, raptors or past signs of raptor use. Weather conditions during the field inspection were as follows: temperature was approximately 40 degrees F, winds were at approximately 10-15 mph, and cloud cover was estimated to be 40 percent. All plant and wildlife species observed in the action area were recorded, and digital photos were taken (Appendix C).

ACTION AREA

Proposed Project Area (PPA)

The proposed project area (PPA) includes the proposed well pad, access road, well-tie pipeline ROW, construction zones and surrounding areas.

Physical Description of Area

The Federal B Com 91 is proposed to be developed in the San Juan Basin of northern New Mexico. The PPA is located on Crouch Mesa. Local topography of the PPA consists of gently sloping, south facing hillside terrain with small ephemeral washes throughout. The area generally drains into Jones Arroyo. Jones Arroyo flows into the Animas River (perennial) 3.1 miles northwest. Elevation in the immediate PPA is between 5871 and 5740 feet.

The general soil mapping units present in the proposed action area is Gypsiorthids-Badland-Stumble complex, 5 to 30 percent slopes. This soil complex typically occurs on hills, breaks and ridges. These soils are deep and somewhat excessively drained with slow to rapid permeability. Typically the surface layer is a mix of pale yellow sandy loam, barren shale uplands and yellowish brown loamy sand between 4 to 8 inches thick.

Biological Description of Area

The proposed project is located within a pinon-juniper woodland vegetation community. Vegetative cover was visually estimated at 35 percent. The shrub component accounted for approximately 30 percent of the cover, trees accounted for approximately 30 percent of the cover and perennial grasses and scattered forbs made up the remaining 40 percent of the cover. Dominant shrubs included rabbitbrush *(Chrysothamnus nauseosus)* and big sagebrush *(Artemisia tridentada).* Trees within the PPA included mixed sera! pinon *(Pinus edulis)* and juniper *(Juniperus sp.).*

No federal or state designated noxious/invasive weeds were observed during on-site inspections of the proposed project area. According to BLM/FFO GIS data of active raptor nest sites, updated annually, no active raptor nests are located within 1/3 of a mile of the proposed project area. Plants and animals, or evidence of their presence, that were observed in the PPA are listed in Appendix D.

BLM Areas of Critical Environmental Concern and Specially Designated Areas

The PPA is not located within any BLM/FFO designated area of critical environmental concern (ACEC).

The proposed action is located within the BLM/FFO special management area for the BLM Sensitive and State of New Mexico Endangered Brack's hardwall cactus (*Sclerocactus cloveriae ssp brackil)* and Aztec gilia *(Aiiciella* formosa).

"

Species Warranting Detailed Evaluation

Brack's hardwall cactus (*Sclerocactus cloveriae* ssp *bracki1)*

Status: Federal Species of Concern; New Mexico State Endangered

Brief Description: Stems 3-8 em long, 2-7 em in diameter; ribs usually 13; tubercles protruding above the ribs, central spines usually 4-5, lower one hooked, lateral centrals straight and slightly shorter; radial spines usually 6-7; flowers 2.5-3.5 em long, 1.5-3.0 em in diameter, tepals purple. Flowers in May.

Known Distribution: New Mexico, San Juan County, known from limited areas on both sides of the San Juan River valley.

Habitat Sandy clay strata of the Nacimiento Formation in sparse shadscale scrub; 1,500-1,950 m (5,000-6,400 ft).

Aztec gilia *(Aiiciella formosa)*

Status: Federal Species of Concern; New Mexico State Endangered

Brief Description: Perennial, 7-30 em tall, older plants woody at the base, glandular; stems numerous, branched; leaves entire, 25 mm long, sharp-pointed; flowers pinkish-purple, trumpet-shaped, about 22 mm long. Flowers April and May.

Known Distribution: New Mexico, San Juan County, near Aztec and Bloomfield.

Habitat Salt desert scrub communities in soils of the Nacimiento Formation; 1,500-1,950 m (5,000-6,400 ft).

Remarks: *Aliciel/a formosa* is only found growing in soils derived from the Nacimiento Formation and is often found with *Sclerocactus cloveriae* ssp. *brackii.*

SURVEY RESULTS

Federally Listed Threatened and Endangered Species

According to the U.S. Fish and Wildlife Service, there are eight (8) federally listed threatened or endangered species; one (1) proposed threatened species; and one (1) Candidate listed species with potential to occur in San Juan County, New Mexico. Table 1 lists these species, their conservation status, habitat requirements, and potential to occur in the proposed action area. None of the listed species has potential to occur in the proposed action area based upon evaluations of habitat requirements and field surveys.

No year round prairie-dog colonies occur within the action area to support black-footed ferret *(Mustela nigripes).* No perennial water resources were present to support Colorado pikeminnow *(Ptychocheilus lucius)* or razorback sucker *(Xyrauchen texanus).* No riparian habitat was present to support southwest willow flycatcher *(Empidonax traillii extimus)* or yellow-billed cuckoo *(Coccyzus americanus).* No sparsely vegetated open grassland is present to support mountain plover *(Charadrius montanus).*

The elevation of the PPA would not support Knowlton's cactus *(Pediocactus knowltonil).* Point Lookout Sandstone does not occur in the area to support Mancos milkvetch *(Astragalus humillimus).* PPA geology does not have any Mancos or Fruitland Shale Formations to support Mesa *Verde* cactus (*Sclerocactus mesae-verde*).

The proposed project is not located within designated critical habitat for the Mexican spotted owl (*Strix occidentalis lucida)* or the Colorado pikeminnow *(Ptychocheilus lucius).*

BLM/FFO Special Management Species

Of the nine (9) BLM/FFO Special Management Species with potential to occur in San Juan County, New Mexico, four (4) have the potential to occur in the project or action area (see Table 2.0).

The proposed action area provides potential foraging habitat for the American peregrine falcon *(Falco peregrinus),* Prairie falcon *(Falco mexicanus)* , Golden eagle *(Aquila chrysaetos)* and Ferruginous hawk *(Buteo regalis).* No birds of prey or signs of their presence were observed during the biological field survey.

The proposed action is located within the BLM/FFO special management area for the BLM Sensitive and State of New Mexico Endangered Brack's hardwall cactus (*Sclerocactus cloveriae ssp brackil)* and Aztec gilia *(Aiiciella formosa)*; Nacimiento Formation, which provides the appropriate geologic substrate for the Brack's hardwall cactus *(Sclerocactus cloveriae ssp brackit)* and Aztec gilia *(Aiiciella formosa),* does not occur in proposed project area. Neither of these species were observed during the biological field survey of the project area.

The remaining species do not have the potential to occur in the area because the project or action area does not provide suitable habitat for them to occur. No suitable nest burrows in open grassland or desert scrub habitat were observed to support Burrowing owls *(Athene cunicularia).* No mature cottonwood galleries along river corridors within or near the PPA to support Yellow-billed Cuckoo *(Coccyzus americanus).* No seasonal wet areas or alkali flats to support Parish's alkali grass *(Puccinellia parishii).*

The proposed project is not located within a bald eagle *(Haliaeetus leucocephalus)* Area of Critical Environmental Concern (ACEC).

DISCUSSION

The proposed action would be in compliance with threatened and endangered species management guidelines outlined in the September 2002 Biological Assessment (Consultation No. 2-22-01-1-389), conducted for the Farmington Resource Management Plan/Environmental Impact Statement (USDI 2003). No further consultation with the U.S. Fish and Wildlife Service is required.

The Migratory Bird Treaty Act implements various treaties and conventions between the U.S. and Canada, Japan, Mexico and the former Soviet Union for the protection of migratory birds. Under the Act, taking, killing or possessing migratory birds is unlawful.

Executive Order 13186 (EO) was signed on January 10, 2001 directing executive departments and agencies of the federal government to take certain actions to further implement the Migratory Bird Treaty Act. Section 3 of the EO directed each federal agency taking actions that have, or are likely to have, a measurable negative effect on migratory bird populations to develop and implement, within 2 years, a Memorandum of Understanding (MOU) with the Fish and Wildlife Service (Service) that shall promote the conservation of migratory bird populations. Section 3 (c) of the EO states that the MOU shall recognize that the agency may not be able to implement some elements of the MOU until such time as the agency has successfully included them in each agency's formal planning process (such as revision of agency land management plans) including public participation and NEPA analysis, as appropriate.

A National MOU to promote the conservation of migratory bird populations between BLM and the Service was not completed during the development of the revised RMP. Consultation on the Biological Assessment (BA) with the Service for the RMP was completed on October 2, 2002, the Environmental Impact Statement (EIS) was completed in March 2003, and the Record of Decision (ROD) for the RMP was signed in September of 2003. There are no management constrains or mitigation measures pertaining to the Migratory Bird Treaty Act listed within the RMP, BA, EIS, or ROD. There are no applicable mitigation measures pertaining to the MBTA to attach to proposed actions.

A National MOU between BLM and the Service was signed on April 4, 2010. Section XI (I) of the MOU states that the BLM may not be able to implement all elements of this MOU upon signature of the MOU. Incorporation of all elements of the MOU into land use planning will be facilitated by land use plan

maintenance, amendment, or revision. Until such time, the BLM will continue to analyze impacts to migratory birds in NEPA documents, list the Migratory Bird Treaty Act as a Law that the owner of any BLM permit must comply with, and recommend that construction activities occur in a manner that minimizes impacts to migratory birds.

The proposed project would remove approximately 40 to 60 trees.

CERTIFICATION

To the best knowledge of Adkins Consulting, the proposed project, with the successful implementation of mitigation measures, would not violate any provisions of the Endangered Species Act of 1973, as amended. Conclusions are based on actual field examinations and are correct to the best of my knowledge.

04/15/11

Date

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505.592.3143

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USFWS 2008	US Fish and Wildlife Service (USFWS) .W.S. 2008. http://www.fws.gov/southwest/es/EndangeredSpecies/lists/. (Accessed March 2011).

Table 1. Species listed by the United States Fish and Wildlife Service (USFWS) under the authority of the Endangered Species Act of 1973 (E = endangered; T = threatened; PT = proposed threatened; C = candidate)

SPECIES	CONSERVATION STATUS	HABITAT ASSOCIATIONS	POTENTIAL TO OCCUR IN THE ACTION
MAMMALS			
Black-footed ferret *(Mustela nigripes)*	E	Open grasslands with year-round prairie dog colonies.	No prairie dogs or prairie dog burrows occur within the proposed project area (PPA)
BIRDS			
Mexican spotted owl *(Strix occidentalis lucida)*	T	Nests in caves, cliffs, or trees in steep-walled canyons of mixed conifer forests.	No potential habitat in PPA due to a lack of mixed coniferous forests, steep walled canyons, caves and cliff edges
Mountain plover *(Charadrius montanus)*	PT	Lowland grasslands, sites with grassland characterists (alkali flats, agricultural lands)	No suitable habitat in PPA
Yellow-billed cuckoo *(Coccyzus americanus)*	C	Nests in large groves of broad-leafed deciduous trees dominated by late-successional cottonwood/willow associations with a dense understory	PPA does not have potential habitat due to a lack of large groves of preferred trees.
Southwestern willow flycatcher *(Empidonax raillii extimus)*	E	Breeds in dense, shrubby riparian habitats, usually in close proximity to surface water or saturated soil.	No potential habitat in PPA due to lack of riparian areas.
FISH			
Colorado pikeminnow *(Pfychocheilus lucius)*	E	Swift flowing muddy rivers with quiet, warm backwaters.	No perennial rivers exist within the PPA.
Razorback sucker *(Xyrauchen texanus)*	E	Habitats include deep, clear to turbid waters of large rivers and some reservoirs over mud, sand or gravel.	No perennial water sources exist within the PPA.
PLANTS			
Knowlton's cactus *(Pediocactus know/toni!)*	E	Alluvial deposits that form rolling, gravelly hills in pinon-juniper and sagebrush communities (6,200-6,400 ft.).	No potential habitat in PPA due to lack of gravelly soils within pinon-juniper.
Mancos milkvetch *(Astragalus humilfimus)*	E	Cracks of Point Lookout Sandstone of the Mesa Verde series (5,000-6,000 ft.).	Point Lookout Sandstone does not occur in the PPA
Mesa Verde cactus (*Sclerocactus mesae-verde)*	T	Highly alkaline soils in sparse shale or adobe clay badlands of the Mancos and Fruitland formations (4,000-5,550 ft.)	PPA geology does not have any Mancos or Fruitland Shale Formations

Sources: US Fish and Wildlife Service (USFWS) 2008, Bureau of Land Management (BLM) 2008

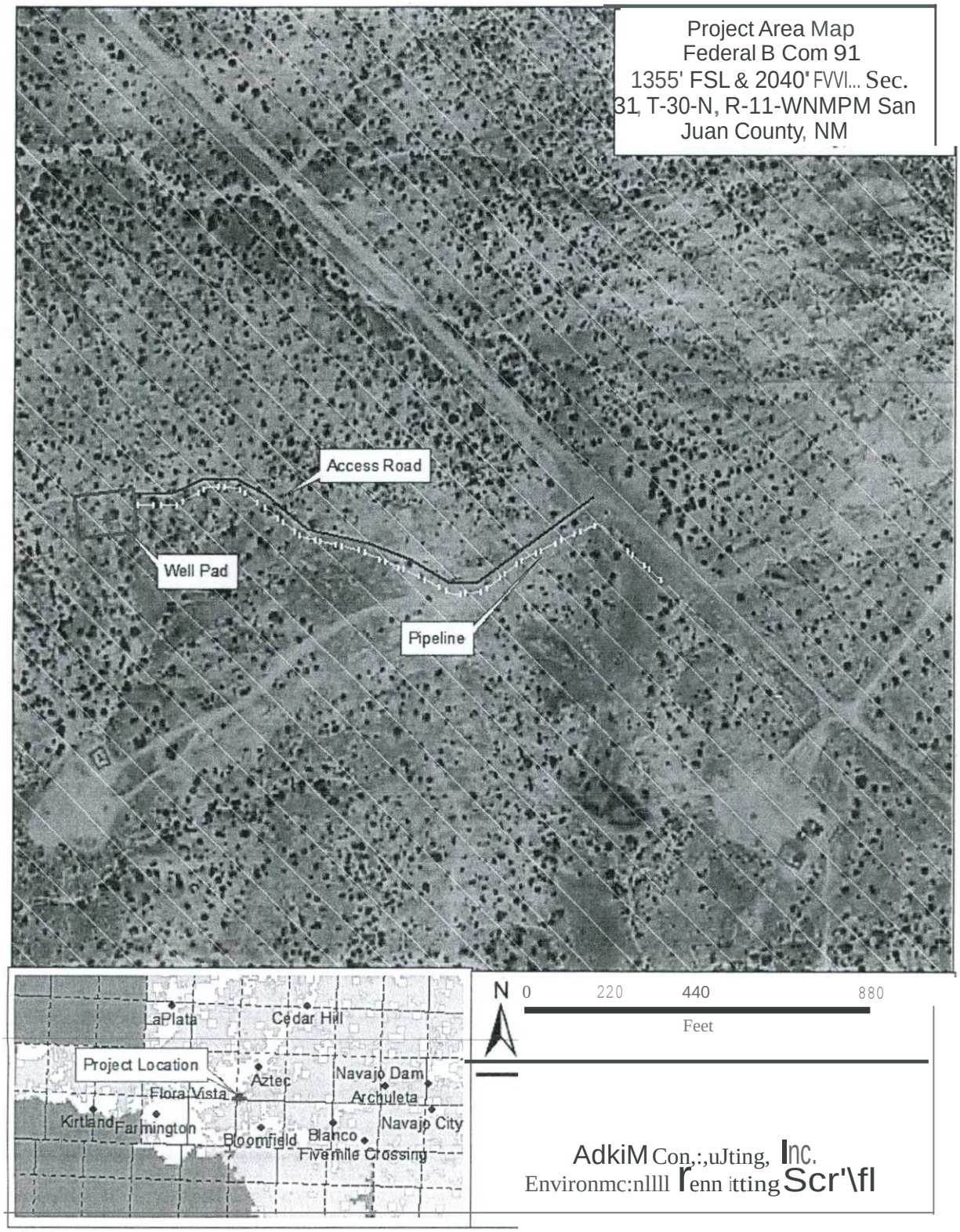
Table 2. Species with special conservation status in San Juan County that occur or have the potential to occur in the project area. Species are listed by the Bureau of Land Management (BLM) as S = sensitive; SMS = special

Common Name (scientific name)	Status*	Habitat Associations	Presence**
BIRDS			
Golden eagle *(Aquila chrysaetos)*	SMS	In the west, mostly open habitats in mountainous, canyon terrain. Nests primarily on cliffs and trees.	Potential foraging habitat is present
Ferruginous hawk *(Buteo regalis)*	SMS	Breed in open country, usually prairies, plains and badlands; semidesert grass-shrub, sagebrush-grass & pinon-juniper plant associations.	Potential foraging habitat is present
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.	Potential foraging habitat is present
Prairie falcon *(Falco mexicanus)*	SMS	Open: grassland, desert scrub, rangeland, agricultural; nest in cavities, ledges, on cliffs, trees, power structures.	Potential foraging habitat is present
Yellow-billed cuckoo *(Coccyzus americanus)*	C SMS	Breeds in riparian woodlands with dense, understory vegetation.	No riparian habitat in PPA
Burrowing *owls(Athene cunicularia)*	SMS	Open grasslands or desert scrub. Presence of suitable nest burrow is critical prerequisite (often prairie dog burrows)	No suitable burrows in PPA.
PLANTS			
Parish's alkali grass *(Puccinellia parishii)*	S NM-E	Alkaline springs, seeps & seasonally wet areas; 2600-7200'	No suitable habitat in the PPA
Brack's hardwall cactus *(Sclerocactus cloveriae* ssp *brackil)*	S NM-E	Sandy clay of the Nacimiento Formation in sparse shadscale scrub (5,000-6,000 ft.)	Nacimiento formation was not present in the PPA.
Aztec gilia *(Aiiciella formosa)*	S NM-E	Salt desert scrub communities in soils of the Nacimiento Formation (5,000-6,000 ft).	Nacimiento formation was not present in the PPA.

Sources: Bureau of Land Management (BLM) 2008, New Mexico Natural Heritage Program 2006

Status•
C = Federal Candidate; S = BLM Sensitive; SMS = BLM Special Management Species; NM-E = State of NM Endangered; NM-T =State of NM Threatened

APPENDIX A
Project Area Map



APPENDIX B
SURVEY PLATS OF PROJECT AREA

APPENDIX C
PHOTOGRAPH OF SURVEY AREA

APPENDIX D PLANTS AND WILDLIFE OBSERVED IN THE ACTION AREA OF THE PROPOSED PROJECT

GRASSES	
Hilaria jamesii (Torr.) Benth.	Galleta
Oryzopsis hymenoides (R.&S.) Ricker	Indian rice grass
Sitanion hystrix	Bottle brush squirreltail
SHRUBS	
Artemisia Tridentata Nutt.	Big sagebrush
Chrysothamnus nauseosus	Rabbitbrush
Fend/era rupicola	Broom snakeweed
Atriplex confertifo/ia	Shadscale
Atriplex canescens	Four-wing saltbush
TREES	
Juniperus mono-sperma	One-seed juniper
Juniperus osteosperma	Utah juniper
Pinus edu/is Engelm.	Pinon pine
CACTUSNUCCA	
Opuntia polyacantha Haw	Plains prickly pear
WEEDS	
Sa/so/a *iberica*	Russian thistle
BIRDS	
Catharte aura	Turkey vulture
Corvus corax	Common raven
MAMMALS	
Odocoileus hemionus	Mule deer (scat)
Sy/vi/agus audubonii	Desert cottontail