ENVIRONMENTAL ASSESSMENT

for the

Nye SRC No. 13N
Well Pad and Pipeline Tie
(Revised)

Burlington Resources Oil and Gas Company LP
Williams Four Corners, LLC

BLM EA No. NM-F010-2011-217

Well Location:
1150' FSL & 1722' FEL
Section 12, Township 30 North, Range 11 West,
New Mexico Principal Meridi n,
San Juan County, New Mexico

U. S. Department of the Interior
Bureau of Land Management
Farmington Field Office

April2011
Revised July 2011

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BUREAU OF LAND MANAGEMENT-
FARMINGTON FIELD OFFICE

ENVIRONMENTAL ASSESSMENT
FOR
BURLINGTON RESOURCES OIL AND GAS COMPANY LP'S
NYE SRC No.13N WELL PAD &
WILLIAMS FOUR CORNERS, LLC's
ASSOCIATED PIPELINE TIE

1.0 Introduction

1.1 The Proposal

Burlington Resources Oil and Gas Company LP (Burlington) has an Application for Permit to Drill (APD) with the Bureau of Land Management, Farmington Field Office (BLM-FFO) for the Nye SRC No. 13N, a Basin Dakota/Blanco Mesaverde gas well. The proposed action would include the construction of a well pad, the drilling and production of a well, the usage of the well pad throughout the life of the well, and the final abandonment of the well and well pad. Williams Four Comers, LLC (Williams) would construct, operate, and finally abandon an associated pipeline tie, which would be necessary to transport gas from the proposed well.

The proposed action area would be on surface managed by the BLM-FFO. The minerals associated with the proposed action are also managed by the BLM-FFO. The BLM is authorized under the Mineral Leasing Act of 1920 (MLA), as amended (30 United States Code [USC] 181 et seq.), to issue oil and gas leases for exploration and development. Minerals extracted as a result of the proposed action would be associated with a valid, existing gas lease, NMSF 0078198, issued in 1948. Burlington is the lessee of record for the lease.

Per 40 Code of Federal Regulations (CFR) 1508.28 and 1502.21, this site-specific Environmental Analysis (EA) tiers into and incorporates by reference the information and analysis contained in the Farmington Proposed Resource Management Plan/Final Environmental Impact Statement (PRMP/FEIS) and the Farmington Resource Management Plan (RMP), approved per the September 29, 2003 Record of Decision (ROD). The RMP with ROD is available for review at the BLM-FFO (Farmington, New Mexico) or at www.nm.blm.gov/ffo/ffo_home.html. This EA addresses site-specific resources and effects of the proposed action that were 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 United States Code [USC] 4321 et seq.).

1.2 Purpose and Need

The need for the BLM to approve the proposed action is to comply with an existing gas lease, which constitutes a binding legal contract.

The purpose of approving the proposed action is to authorize Burlington, via an APD, to construct, drill, operate, and finally abandon the proposed well and any associated facilities. These activities would allow production of Basin Dakota/Blanco Mesaverde gas from the lease.

1.3 Conformance with Applicable Land Use Plan and Other Environmental Assessments

The regulations under 43 CFR 1610.5 require the proposed action to be in conformance with the terms and the conditions of the Farmington RMP. The Federal Land Policy and Management Act of 1976 (FLPMA) established guidelines to provide for the management, protection, development, and enhancement of public lands (Public Law 94-579, 43 USC 1701 et seq.). Under this authority, Specially Designated Areas (SDAs) and Areas of Critical Environmental Concern (ACECs) are identified in the RMP. The proposed action area is not within any SDAs or ACECs.

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

Burlington and Williams would comply with all applicable Federal and State of New Mexico laws and regulations (Appendix A). Non-point source pollution is an identified problem in the planning area that is directly associated with soil stability and water quality. The New Mexico Energy, Minerals and Natural Resources Department requires operators to follow "pit rule" guidelines contained within NMAC 19.15.17 in an effort to reduce groundwater contamination from industry related activities. Mandated by the Clean Water Act (CWA), efforts to reduce non-point source pollution through implementation of erosion control and management practices are an important part of the BLM's management activities. Industrial activities disturbing land may require permit coverage through a National Pollution Discharge Elimination System (NPDES) stormwater discharge permit. Oil and gas development, however, is exempt from NPDES regulation per 40 CFR Part 122. A U.S. Army Corps of Engineers Section CWA 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.

Consultation with the U.S. Fish and Wildlife Service (USFWS), as required by Section 7 of the Endangered Species Act, was conducted as part of the Farmington PRMP/FEIS (Consultation No. 2-22-01-1-389) to address cumulative effects of RMP implementation. The consultation is summarized in Appendix M of the PRMP/FEIS. Review of current USFWS Federally Listed Species and an onsite evaluation of habitat for the proposed action indicate no need for additional Section 7 consultation.

Compliance with Section 106 responsibilities of the National Historic Preservation Act are adhered to by following the BLM–New Mexico State Historic Preservation Officer (NM 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 Council of State Historic Preservation Officers.

The State of New Mexico Oil Conservation Commission (NMOCC) has assigned spacing rules for producing oil and gas formations. Current spacing for the Basin Dakota and Blanco Mesaverde formations is 320 acres per four wells.

Additionally, Burlington unwillingly:

- Comply with all applicable Federal, State of New Mexico, and local laws and regulations. A listing of selected Federal laws and regulations applicable to the proposed action can be found in Appendix A.
- Obtain applicable permits for the construction, drilling, completion, production, and final abandonment of this well including water rights appropriations, water discharge permits,

relevant air quality permits, and permits associated with the installation of water management facilities.

2.0 Alternatives Including the Proposed Action

2.1 Alternative A- No Action

The No Action Alternative provides a reference, enabling decisionmakers to compare the magnitude of environmental effects of the alternatives. The BLM NEPA Handbook (H-1790-1) states that for EAs on externally initiated proposed actions, the No Action Alternative generally means that the proposed activity would not take place. This option is provided in 43 CFR 3162.3-l(h)(l). The No Action Alternative would deny the approval of the proposed APD. The well would not be drilled, and 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

Burlington has proposed the drilling, production, and final abandonment of a natural gas well and the construction, operation, and final abandonment of an associated well pad. Williams has proposed the construction, operation, and final abandonment of an associated pipeline tie. The action is proposed for 2011.

2.2.1 General Location and Description

Maps of the proposed action area are located on the following pages. The proposed action area is plotted on a 250,000:1 composite map (Figure 1); the Aztec, New Mexico, 7.5-minute United States Geological Service quadrangle map (Figure 2); and a 2009 San Juan County aerial photo (Figure 3).

The proposed action area is located in the San Juan Basin of northwestern New Mexico, approximately 2.2 miles east of the town of Aztec and 500 feet north of New Mexico State Highway 173. The general area consists of rolling hills and ephemeral washes. Terrain within the proposed action area ranges from flat to hilly. Badlands are present on the northern and northeastern sides of the well pad. Elevation at the proposed well pad is approximately 6051 feet. The proposed well pad would partially overlap the plugged and abandoned (P&A) Nye No. 7 well pad and an existing access road. It would be immediately northwest of the existing Nye No. lA well pad, and approximately 50 feet northeast of the northeastern side of the existing Nye SRC No. 10 well pad. Kart Kanyon Speedway, an outdoor dirt-racing track, is located approximately 600 feet west of the proposed well pad. Informal dirt bike routes, shotgun shells, and trash are found within and surrounding the proposed action area. The proposed well pad would be on the periphery of open pinon-juniper woodland and sagebrush shrubland.

Directional drilling would be utilized. The proposed bottom hole would be 1122 feet from the south line (FSL) and 1909 feet from the west line (FWL) of Section 12, Township 30 N01th, Range 11 West, New Mexico Principal Meridian (NMPM), San Juan County, New Mexico. The wellhead (surface) location would be 1150 feet FSL and 1722 feet from the east line (FEL) of SectiOn 12. The proposed wellpa<I and pipeline tie would all be within the western half of the southeastern quarter of Section 12.

Figure 1: Vicinity Map
Burlington Resources Oil & Gas Company LP
Proposed Nye SRC No.13N
T30N, R11W, Section 12, NMPM
Sa.n Juan County, New Mexico

Figure 2: Project Area Map
Burlington Resources Oil & Gas Company, LP
Proposed Nye SRC No. 13N
T30N, R11W, Section 12, NMPM
San Juan County, New Mexico

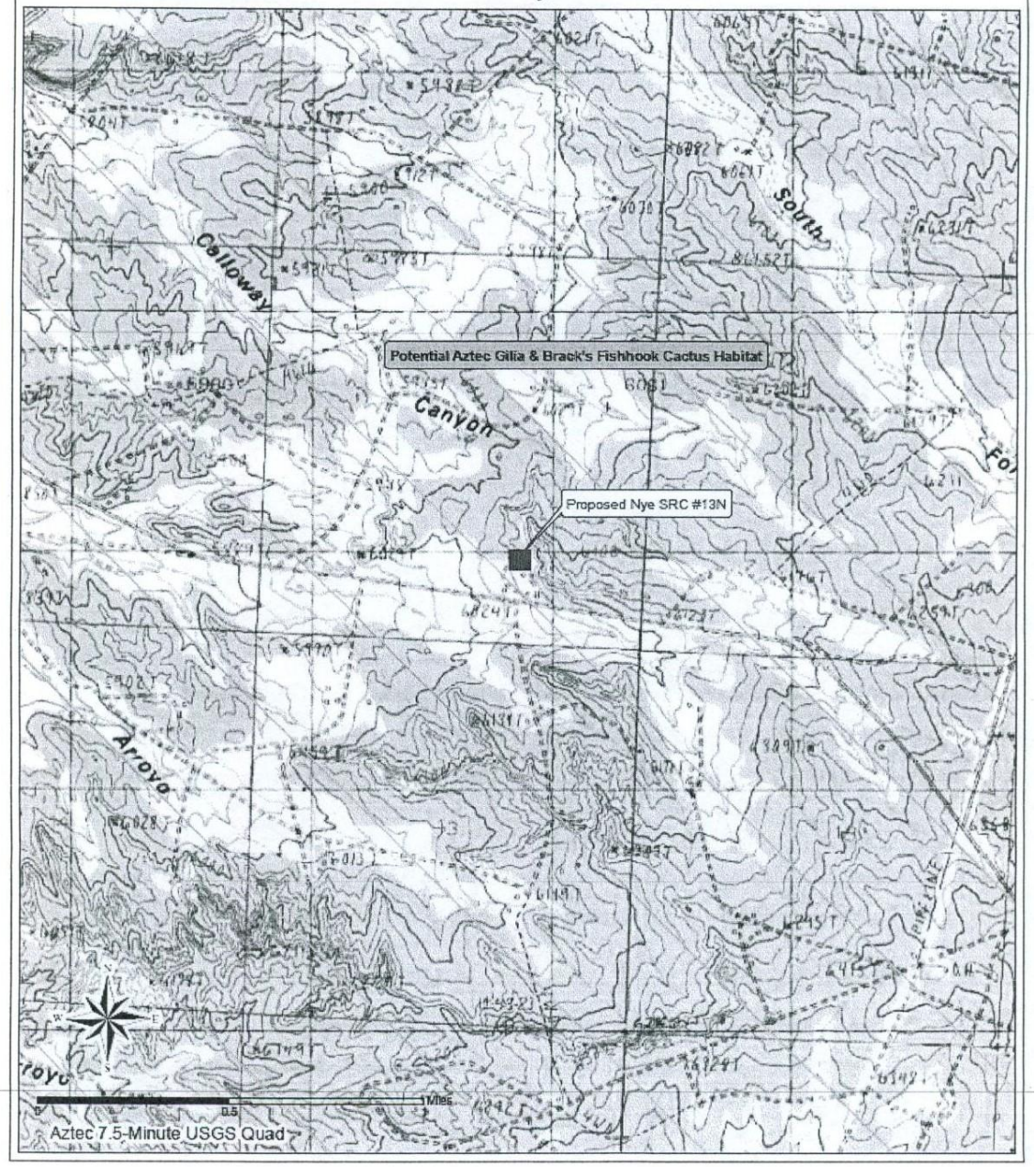
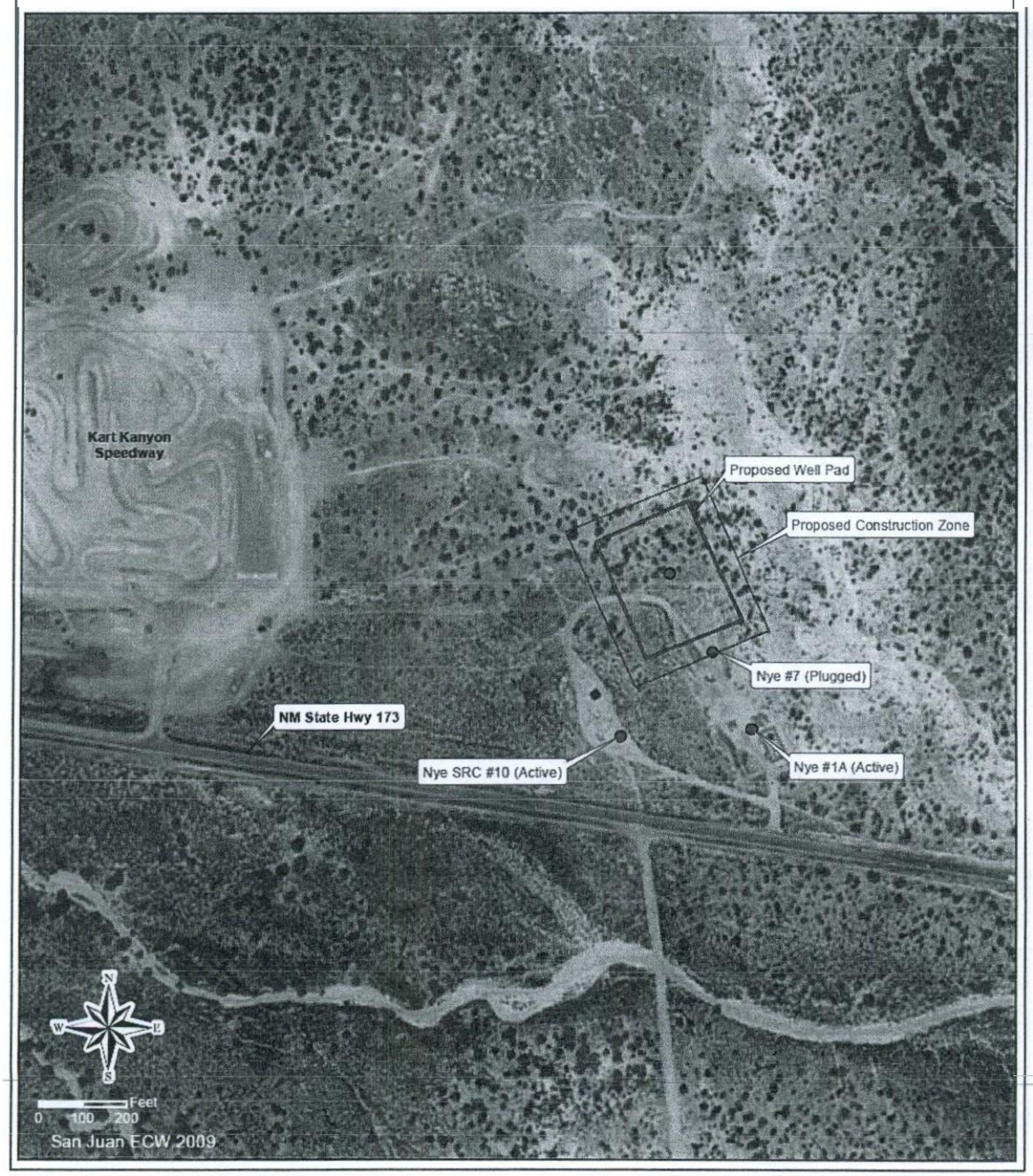


Figure 3: Aerial Photo
Burlington Resources Oil & Gas Company, LP
Proposed Nye SRC No. 13N
T30N, R11W, Section 12, NMPM
San Juan County, New Mexico



2.2.2 Proposed Action Phases

Construction Phase

The maximum permitted surface disturbance associated with the proposed action would be approximately 3.24 acres. Actual new disturbance would be approximately 2.75 acres. Survey plats are provided in Appendix B. For a detailed description of design features and construction practices associated with the proposed action, refer to the APD on file at the BLM-FFO.

Table 1: Proposed Surface Disturbance

Project Component	Previous/ Existing Disturbance (acres)	New Disturbance (acres)	Total
Well Pad	0.29	2.74	3.03
Pipeline Tie	0.20	0.01	0.21
TOTAL	0.49	2.75	3.24

Well Pad

A new well pad would be created using a D-8 bulldozer. Leveling is needed to provide space and a level surface for a drilling rig, completion rig, and other heavy equipment to access and drill the proposed well. The proposed well pad would measure 230 feet by 300 feet. A 50-foot-wide construction zone would surround the proposed well pad. Thus, maximum disturbance associated with the well pad would be 3.03 acres.

The proposed well pad overlaps 0.21 acre of the Nye No. 7 P&A well pad, which has not yet been successfully reclaimed. In addition, approximately 117 feet (0.08 acre) of an existing, active access road travels through the proposed well pad. Therefore, *new* disturbance associated with the well pad would be approximately 2.74 acres.

The maximum cut would be 12 feet on the eastern corner (No. 6) of the proposed pad. The maximum fill would be 12 feet on the western corner (No.3) and southwestern side (B').

Pipeline Tie

Once the proposed well is completed, a 224.6-foot-long, 40.0-foot-wide pipeline tie route would connect the proposed well to the existing Nye No. 1A pipeline. The maximum disturbance resulting from the pipeline tie would be approximately 0.16 acre. However, 215.0 feet of the proposed pipeline tie would overlap the proposed well pad and construction zone. The remaining 9.6 feet of the pipeline tie would result in new disturbance of 0.01 acre.

Recommended mitigation measures would be implemented as Conditions of Approval (COAs) to the APD; additional mitigation may be listed in the SOA. Below are site-specific construction mitigation measures determined for the proposed action, per the April 5, 2011 onsite meeting:

- GENERAL CONSTRUCTION:
  - Trees greater than six inches in diameter at breast height would be cut, delimbed, and stacked at the edge of the Nye No. 7 P&A pad.
  - The top six inches of topsoil would be stockpiled to be utilized during reclamation.
  - Excavated materials from cuts would be used on fill portions of the location.
  - The northeastern construction zone would be limited to avoid cutting into the steep badland hills.
  - A water diversion would be constructed above the cut, from Corners No. 6 to No. 5. Two silt traps would be constructed in the construction zone, between these corners.
  - Low-profile equipment would be used.
  - Above-ground structures would be painted Carlsbad Brown to blend with the natural color of the landscape.
  - The existing road would be repaired, and a 24-inch-diameter culvert would be placed beneath the road between the proposed well pad and Highway 173.

- PITS:
  - The reserve pit would be lined with an impervious material, at least 12 millimeters thick.
  - All pits would meet State of New Mexico, Oil Conservation Division (NMOCD) pit guidelines and rules, NMAC 19.15.17.
  - Upon final reclamation of the reserve and blow pits, pits would be filled utilizing existing disturbance only.
  - Cut material from the reserve and burn pits would be stockpiled on the location or used to construct back-walls of the burn pit.
  - 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.

Drilling Phase

After the well pad is constructed, a drilling rig would be moved onto the location and assembled. Drilling to the formations would require approximately 14 days. After the well has been drilled, completion would take approximately 14 additional days. Construction, drilling, and completion are expected to require four to eight weeks total. During this phase, both heavy uipment and li ht vehicles would use existing BLM roads to access the well site. Traffic would include drilling rigs, large tractor-trailers, construction equipment, water trucks, drilling and production equipment, tanks, and numerous light pick-ups.

Production Phase

Interim Reclamation

After the well is completed, interim reclamation would occur. During interim reclamation, portions of the proposed action area not required for production equipment and vehicular access would be reclaimed. This reclaimed area, which would include the pipeline tie, the well pad construction zone, and other portions of the well pad, would total approximately 1.75 acres. The following would occur during interim reclamation:

- Slopes would be recontoured to pre-construction topographical contours.
- Disturbed areas would be seeded with a BLM-FFO-designated seed mix.

Equipment Onsite

Production equipment may be required to conform to BLM-FFO Noise Notice to Lessees (NTL) standards. The well production equipment that would remain onsite would incl de the following:

- Dual wellhead
- Production unit separator
- Cathodic station with solar panel
- Meter run with electronic telemetry
- One to two 500-barrel storage tanks
- Possibly a compressor, to assist in bringing fluids and gas to the surface. The compressor size would be dependent upon production.

Activities

After production of the well begins, normal upkeep would be required. Typically, one pick-up truck would come to the well site approximately every two days during the normal work week to check on production and resolve any problems that may occur at the well. Trucks would be used to remove wastewater stored in tanks on the site. The frequency of water hauling would depend on the amount of water the well produces and may vary from once a day to once a month. Occasionally, a work-over rig would be required for downhole maintenance. Surface impacts of a work-over rig would be similar to the effects described for drilling, although usually to a lesser degree. The estimated roduction phase of a well is 20 to 30 years.

Abandonment Phase

When the well is no longer commercially viable, it would be plugged and abandoned as follows:

- Downhole well abandonment would be carried out under current BLM-FFO regulations for well plugging and surface restoration.
- Surface equipment would be removed, except for an aboveground marker that would contain individual well identification information, including the location of the plugged hole.
- The proposed well pad and the existing access road, if not needed for other purposes, would be reclaimed as specified in the approved COAs. Typically, slopes would be recontoured to pre-construction topographical contours. Disturbed areas would be seeded with a BLM-FFO-designated seed mixture.
- The underground pipeline tie would typically be plugged and left in place.

2.3 Alternatives Considered but not Analyzed in Detail

Several surface location alternatives were considered for the proposed well. Please refer to Figure 4 (page 14) for a map of these alternatives.

Vertical Drilling Alternative

Vertically drilling to the proposed bottom hole would result in the creation of a new well pad immediately adjacent to Kart Kanyon Speedway. Thus, this location was not analyzed.

Directional Drilling Alternatives

Directional drilling is the practice of drilling non-vertical wells. This practice allows for flexibility in the placement of the well pads and associated surface facilities. Directional drilling often allows for "twinning," or drilling two or more wells from one shared well pad. Directional drilling applications throughout the San Juan Basin have become relatively routine. Generally, the use of this technology is applied when it is necessary to avoid or minimize impacts to surface resources or to access minerals from different bottom hole locations.

Several technical factors must be considered before deciding on the use of directional applications. Factors such as reservoir depth, angle of deviation, lateral displacement, completion technique and risk must all be considered. In addition, operating factors such as production efficiency, rod, pump, and tubing wear, and workover frequency must also be a consideration.

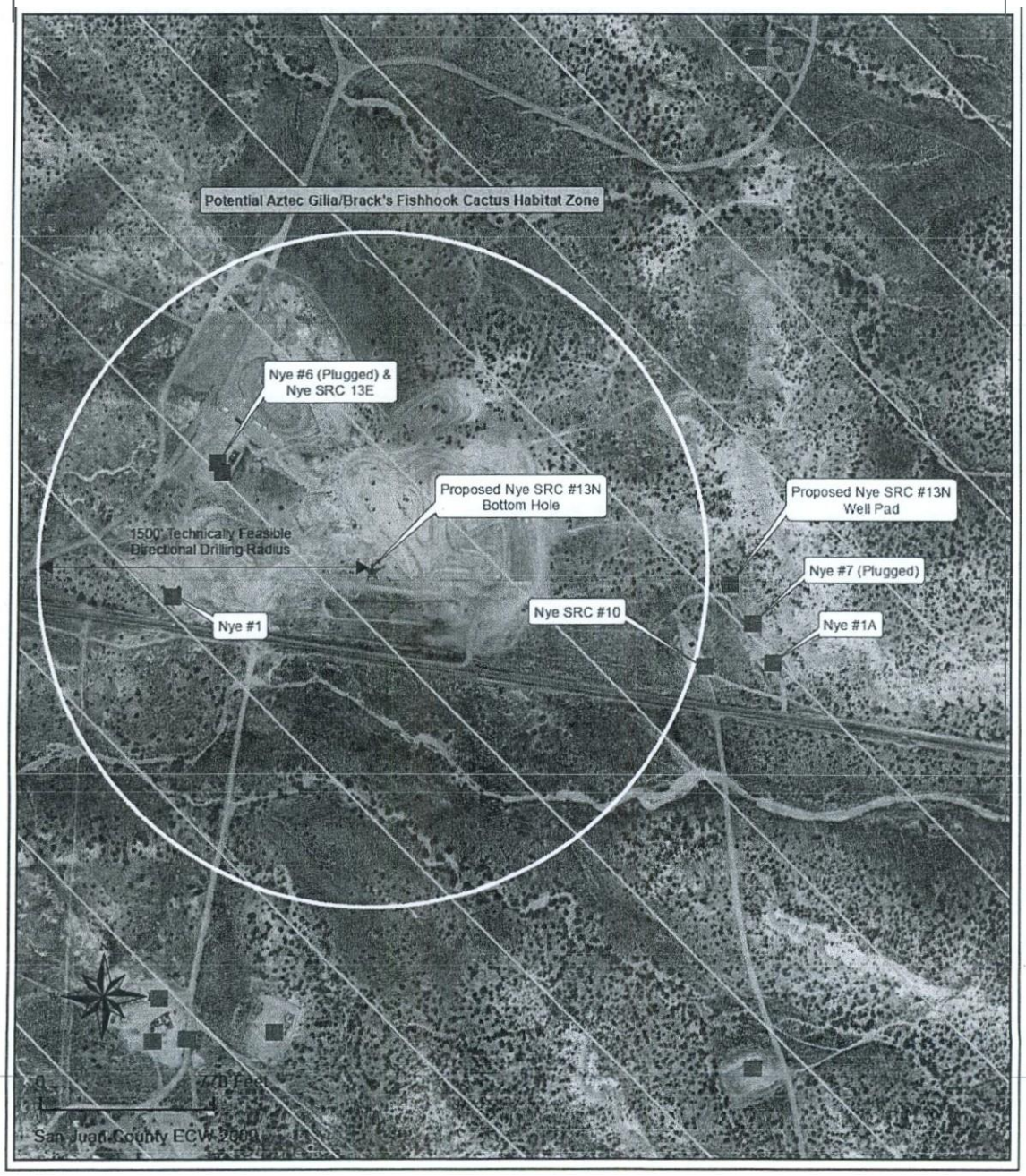
Generally, directional well completion and operating costs are 20 to 25 percent higher than vertical well drilling. The primaty economic factors that determine the feasibility of directional applications include, but are not limited to the following:

- Incremental drilling, completion, and operating costs
- Oil and gas reserves
- Rates of production
- Oil and gas pricing
- Royalties and taxes
- Return on investment

Within a 1500-foot, technically feasible directional-drilling radius of the proposed bottom hole, it is not possible to locate the well pad outside of the BLM-FFO-designated Aztec gilia and Brack's fishhook cactus potential habitat "zone."

The proposed well pad would overlap a P&A well pad and an active access road. Topography and the presence of gas pipelines prevented twinning the proposed well in any other location that would result in less surface disturbance. Therefore, no additional directional-drilling alternatives were analyzed.

Figure 4: Alternative Locations Map Burlington Resources Oil & Gas Company, LP Proposed Nye SRC No. 13N
T30N, R11W, Section 12, NMPM
San Juan County, New Mexico



1.0 Description of Affected Environment

Chapter 3 describes the environment that may be affected by implementation of the proposed action and any alternatives described in Section 2. If they are present, critical resource elements require analysis under BLM policy. These elements are listed below in the below table. Following the table, only those resources that have the potential to be affected by the proposed action are discussed.

Table 2 Potential IR [illegible] and Affected [illegible]

CRITICAL RESOURCE ELEMENTS			
Air Resources	Construction activities and well production facilities are potential emission sources.	YES	3.1' 4.1
Surface and Groundwater Quality and Quantity	Construction activities may result in sedimentation, which could affect water quality downgradient of the proposed action area.	YES	3.2, 4.2
Hazardous and Solid Wastes	Some oil and gas constituent wastes could be subject to regulations as hazardous substances under CERCLA.	YES	3.3, 4.3
Environmental Justice/Socio-Economics	The regional population includes minority and low-income groups.	YES	3.4, 4.4
Cultural Resources	A project-specific cultural resources inventory is required for all ground-disturbing activity.	YES	3.5, 4.5
Native American Religious Concerns	Native American Religious Concerns have been evaluated on a regional and local scale within the BLM-FFO management area. These concerns may be analyzed in detail on a site-specific basis.	YES	3.6, 4.6
Federally Listed Species	Federally Listed Species habitat is present within BLM-FFO boundaries and evaluated on a project-specific basis.	YES	3.7, 4.7
Lnvasive, Non-native Species	The potential for introduction of invasive, non-native species exists through ground disturbance, as well as through transportation of equipment and facilities.	YES	3.8, 4.8
Areas of Critical Environmental Concern (ACEC)	The proposed action area is not within any ACECs	NO	
Wilderness	The proposed action area is not in or near a designated Wilderness Area.	NO	
Wild and Scenic Rivers	No Congressionally-designated or potentially eligible Wild and Scenic Rivers exist within BLM-FFO boundaries; such areas would not be affected by the proposed action.	NO	
FloodplainS---	No floodplains (as defined by Executive Order No. 11988) are presentln tne proposea actiOn area.	NO	
Farmlands, Prime and Unique	No farmlands (as defined by 30 U.S.C. 1201 et seq. and 7 U.S.C. 4202 et. seq.) are present in the proposed action area.	NO	
Wetlands/ Riparian Zones	No surface water resources, seeps, or springs are present within the proposed action area.	NO	
NON-CRITICAL RESOURCE ELEMENTS			

Mineral Resources/ Geology	The proposed action is intended to extract local mineral resources.	YES	3.9, 4.9
Soils	The proposed action includes the disturbance, mixing, and compaction of local soils.	YES	3.10, 4.10
Watershed/ Hydrology	Alterations to soils and vegetation may result in sedimentation downgradient of the proposed action area, consequently affecting local hydrology.	YES	3.11, 4.11
Vegetation/ Forestry	Construction would include the removal of some local vegetation, ultimately changing the species composition.	YES	3.12, 4.12
Wildlife	The proposed action may disturb wildlife species and would result in net habitat loss.	YES	3.13, 4.13
Migratory Birds	The proposed action may disturb migratory bird species and would result in net habitat loss.	YES	3.14, 4.14
Range	The proposed action area is within a BLM-FFO grazing allotment.	YES	3.15, 4.15
Special Management Species (SMS)	SMS habitat is present within BLM-FFO boundaries and is evaluated on a project-specific basis.	YES	3.16, 4.16
Wild Horses and Burros	Wild horses or burros are not present in the proposed action area; these animals would not be affected by the proposed action.	NO	
Recreation	All BLM-FFO lands are managed for recreation.	YES	3.17, 4.17
Visual Resources	The proposed action would result in visual scarring and a change in local topography. Production facilities may result in a long-term change in the landscape view.	YES	3.18, 4.18
Noise	Construction, drilling, and production activities and facilities may result in a change in area noise.	YES	3.19, 4,19
Paleontology	BLM-FFO lands are designated as Very High Potential paleontological resource areas, thus requiring an assessment at the project level.	YES	3.20, 4.20

3.1 Air Resources

The proposed action area is in San Juan County, New Mexico. Additional general information on air quality in the area is contained in Chapter 3 of the BLM-FFO RMP/EIS. In addition, new information about greenhouse gases (GHGs), and their effects on national and global climate conditions has emerged since this RMP was prepared. Ongoing scientific research has identified the potential impacts of GHG emissions (such as carbon dioxide [CO_2] methane [C], nitrous oxide [N_2O], water vapor, and several trace gases) on global climate. Through complex interactions on a global scale, GHG emissions may cause a net warming effect of the atmosphere, primarily by decreasing the amount of heat energy radiated by the earth back into space. Although GHG levels have varied for millennia (along with corresponding variations in climatic conditions),---industrializat-ion and burning of fossil-carbon .sources have caused GHG concentrations to increase measurably, and may contribute to overall climatic changes. These changes are 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 eight-hour standard of 0.075 parts per million (ppm). In addition, on October 17, 2006, the EPA issued a final ruling

on the lowering of the NAAQS for particulate matter measuring 2.5 microns (PM2.5) or smaller. This ruling became effective on December 18, 2006. It stated that the 24-hour standard for PM2.5 was lowered to 35 micrograms per cubic meter (ug/m^3) from the previous standard of 65 ug/m^3. This revised NAAQS was promulgated to better protect the public from short-term particle exposure.

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 be seen in the skies, impacting visibility, and there are concerns for the ecosystem due to the deposition of mercury and nitrogen.

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 EPA has the primary responsibility for regulating air quality, including the regulation of seven nationally regulated ambient air pollutants. Regulation of air quality is also delegated to some states, including New Mexico. Air quality is determined by atmospheric pollutants and chemistry, dispersion meteorology, and terrain. Air quality 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.

Air Quality

The proposed action area is within 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 action area is generally good. The proposed action area is not within an EPA-designated "non-attainment area" 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 anu-rmmitorin s-conducted by Alpine Geophysics, LLC and Environ fnternational Corporations, Inc. in 2003 and 2004. Results of the modeling suggest the episodes recorded in 2000 through 2002 were attributable to regional transport and high natural biogenic source emissions. The model also predicted that the region will not violate the ozone NAAQS through 2007 and that the trends in the 8-hour ozone values in the region will be declining in the future. At the present time, San Juan County is classified as in attainment with the revised federal ozone standard of 0.075 ppm. Rio Arriba County is unclassified because of there are no ozone monitors sited in Rio Arriba County.

Greenhouse gases, including CO_2 and 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 U.S. Greenhouse Gas Emissions and Sinks found that in 2007, total U.S. GHG emissions were over 7 billion metric tons and total U.S. GHG emissions increased by 17 percent between 1990 and 2007. Emissions increased from 2006 to 2007 by 1.4 percent (99.0 Tg C02 Eq.). The following factors were primary contributors to this increase: (1) cooler winter and warmer summer conditions in 2007 than in 2006 increased the demand for heating fuels and contributed to the increase in the demand for electricity, (2) increased consumption of fossil fuels to generate electricity and (3) a significant decrease (14.2 percent) in hydropower generation used to meet this demand (EPA 2009).

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

Climate

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 thrate of climate change. Global mean surface temperatures have increased nearly 1.0° C (1.8° F) from 1890 to 2006 (Goddard Institute for Space Studies, 2007). 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. Observations and predictive models indicate that average temperature changes are likely to be greater in the Northern Hemisphere.

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-irnpacts-on tourism, infrastructure, fishing-and other resouree uses." It is not, however, possible to predict with any cmtainty regional or site specific effects on climate relative to the proposed action and subsequent actions.

In New Mexico, a recent study indicated that mean annual temperatures have exceeded the global averages by nearly 50 percent since the 1970s (Enquist and Gori 2008). Similar to trends in national data, increases in mean winter temperatures in the Southwest have contributed to this rise. When compared to baseline information, periods between

1991 and 2005 show temperature increases in over 95 percent of the geographical area of New Mexico. Warming is greatest in the northwestem, central, and southwestem parts of the state.

3.2 Surface and Groundwater Quality and Quantity

The proposed action area is in the Colorado River Drainage Basin, in which the Animas and San Juan Rivers are the largest perennially flowing streams. No surface waters are located within the vicinity of the proposed action area. Most stream and wash channels in the region are ephemeral. In the region, natural soil erosion compounded by man-made barren surfaces and historic livestock grazing has led to high sedimentation of drainages. The quantity of surface water can reach flash-flood levels during thunderstorms or rapid snowmelts. Runoff and sedimentation in washes during precipitation events can be considerable. Generally, surface water quality in drainages is extremely poor following storm/flood/rapid snowmelt events. Key features that adversely influence the surface water quality include ephemeral water sources, sparse vegetative cover, highly erosive and saline soils, and rapid runoff. Erosion conditions promote the formation of canyons, arroyos, and gullies, further contributing to poor water quality.

The BLM-FFO has estimated that surface runoff frequently contains more than 10,000 milligrams per liter (mg/L) of suspended sediment and more than 1,000 mg/L of total dissolved solids (TDS). Public Law 93-320 mandated control of s linity runoff into the Colorado River Basin.. A 1984 amendment to the Colorado River Salinity Control Act of 1974 "…specifically requires the Director of the BLM to develop a comprehensive program for minimizing salt contributions to the Colorado River and their tributaries from BLM administered lands" (BLM 1988). No specific, quantifiable water quality or quantity data for the proposed action area is available.

Colorado Plateau aquifers underlie an area of approximately 110,000 square miles in western Colorado, northwestern New Mexico, northeastern Arizona, and eastern Utah. The distribution of these aquifers is controlled largely by structural deformation, and the principle aquifers interconnect across the plateau and are present within basins located on the plateau, such as the San Juan, Uinta, and Piceance Basins.

The Uinta-Animas aquifer is widespread across the Colorado Plateau and present in the Uinta, Piceance, and San Juan Basins. Sedimentary rocks in this aquifer are Lower Tertiary in age. The Uinta-Animas aquifer in the San Juan Basin of northwestern New Mexico consists of the San Jose Formation; the underlying Animas Formation in the Durango area and its equivalent in northern New Mexico, the Nacimiento Fonnation; and the Ojo Alamo Sandstone. The Animas Formation in Durango consists of a main body of green volcaniclastic conglomerate, sandstone and shale, and the basal McDermott Member, also a volcaniclastic conglomerate. The Nacimiento Formation and Ojo Alamo Sandstone are primarily permeable conglomerates and sandstones interbedded with less permeable shale and mudstone. The thickness of the aquifer in the northeastern San Juan Basin is approximately 3500 feet. Aquifers beneath the Uinta-Animas — aqrrifera:re--tl!e-Mesa Yerde-aquifer the Dakota-Glen eanyornrquifer,and-the eoconimrDeeltetly-aquifer.

Recharge of the Uinta-Animas aquifer in the San Juan Basin occurs at the higher altitude areas that encircle the Basin. Most water supplies in the Basin are obtained from valley fill deposits of Quaternary age along rivers, and some of the shallower Cretaceous sandstones bodies. Terrace deposits of boulders and cobbles cut into Tertiary bedrock. Thickness of terrace deposits generally does not exceed 30 feet. Alluvial valley fill deposits of sand, gravel, silt, and clay rarely

exceed 100 feet in thickness. Limited surficial and groundwater resources are available due to the arid climate. Irrigation water for agriculture comes from the diversion of the perennial streams and rivers. Outside of the river corridors, dry farming is nearly nonexistent.

3.3 Hazardous or Solid Waste Materials

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 (I) listed by the EPA as a hazardous waste, (2) exhibits any of the characteristics of hazardous wastes (ignitability, corrosivity, reactivity, or toxicity), or (3) is a mixture of solid and hazardous waste. A 1980 amendment to RCRA conditionally exempted from regulation as hazardous wastes "drilling fluids, production waters, and other wastes associated with the exploration, development, or production of crude oil or natural gas." On July 6, 1988, the 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 (I) 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 he 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.

3.4 Environmental Justice/Socio-Economics

On February 11, 1994, the President issued Executive Order No. 12898 concerning Environmental Justice and impacts on minority and low-income populations. The purpose of this order is to identify and address disprop01tionately high or adverse human health and environmental effects from programs, policies, or activities on minority or low-income populations.

In the region around the proposed action area, statistically significant populations include Native Americans, Hispanics, and white Euro-Americans. Some members of these populations are within financially low-income groups. San Juan County has produced oil and gas resources for over 40 years. The extraction of this resource is an income source to the local communities as well as to the County, the State of New Mexico, and the Federal government. Many County and ---l"Oeal contractors and their employees are--employed in some aspect of-the oil and gas--industry-;

3.5 Cultural Resources

The proposed project area is located within the archeologically rich San Juan Basin. The pre-history of the San Juan Basin can be divided into five major periods:

- Paleolndian (cs. 10,000 B.C. to 5,500 B.C.)
- Archaic (ca. 5,500 B.C. to A.D. 400)
- Basketmaker II-III and Pueblo I-IV periods (A.D. 1 to 1540)
- The historic (A.D. 1540 to present)- 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 and Resource Management Plan (2003) and will not be reiterated here. Additional information is also included in an associated documented, Cultural Resources Technical Report (CRTR; SAIC 2002).

The BLM-FFO has categorized variability in archeological sites by major time period, cultural affiliations/components, average size, and occurrence of features in each of the 20 watersheds within the BLM-FFO's jurisdiction (BLM 2003:3-88). The proposed action area is within the Animas Watershed. Based on the CRTR, a total of 965 sites, representing 1376 temporaUcultural components, have been documented within the watershed (BLM 2003b). Ofthe 19 categories of sites defmed based on temporaUcultural affiliation, 17 are represented in the watershed. Lacking in the watershed are sites attributed to Ute and historic Pueblo occupations. The most frequently occurring cultural affiliations are pre-historic Pueblo (aka Anasazi) and Dinetah/Gobemador Navajo components (BLM 2003b:3-9). Features common to these sites include hearths, pithouses, Great Kivas, pueblos, hogans, sweat lodges, artifact scatters, and rock art.

A BLM Class I literature review was conducted by Western Cultural Resource Management (WCRM) prior to the cultural resources inventory (WCRM[F]1013). There are no previously recorded cultural sites within one-quarter mile of the proposed action area.

The entire area of potential affect was surveyed at a BLM Class III level (100 percent) by WCRM; Report WCRM(F)1013 was prepared and submitted to the BLM-FFO in accordance with the *Procedures for Performing Cultural Resources Fieldwork on Public Lands in the Area of New Mexico ELM Responsibilities* (BLM 2005). The BLM concurred with the report's findings in Report No. 20ll(III)025F. No cultural sites were encountered during the survey. One isolated occurrence was recorded.

3.6 Native American 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: I) has defined TCPs as follows:

> A traditional cultural property can be defined generally as one (a property) that is eligible for tlleNatwnal Register 6ecause otits association withcultural practices or belietsof 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 assoctatwns 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):
  1. Possession of sacred items
  2. Performance of ceremonies
  3. Access to sites
- Executive Order 13007 (24 May 1996):
  1. Access and use of sacred sites
  2. 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
  - Objects of cultural patrimony
- The Archaeological Resources Protection Act of 1979 (ARPA; 16 USC 470, Public Law 96-95):
  Protection of archaeological resources on Federal and Indian lands

For the proposed action, identification of TCPs was limited to reviewing existing published and unpublished literature (Val Valkenburgh 1941, 1974; Brugge 1993), 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.

3.7 Federally Listed Threatened or Endangered Species

Eleven federally listed Threatened, Endangered, Candidate, or Proposed species could possibly occur within San Juan County, New Mexico. The table below lists these species along with their status, habitat, and potential to occur within the proposed action area.

Table 3: Federally Listed (Endangered, Threatened, Candidate, & Proposed) Species with Potential to Occur in San Juan County, New Mexico

Species	Federal Status	Habitat	Potential to Occur *in* Proposed Action Area (PAA)
PLANTS			
Knowlton cactus *(Pediocactus knowtonii)*	Endangered	Rolling, gravelly hills in pinon-juniper-sagebrush communities. Elevation –5900-6560 ft.	UNUKELY: No rolling, gravelly hills within PAA.

Species	Federal Status	Habitat	Potential to Occur in Proposed Action Area (PAA)
Mancos milkvetch *(Astragalus humillimus)*	Endangered	Large, nearly flat sheets of Point Lookout sandstone. Clusters around margins of bowl-like depressions in bedrock, or cracks / fissures in the sandstone or at the base of gentle, slickrock inclines. Elevation ~5000-6000 ft.	UNLIKELY: Point Lookout sandstone not identified within the PAA.
Mesa Verde cactus *(Sclerocactus mesae-verdae)*	Threatened	Dry, low, exposed hills and mesas in full sun. Mancos or Fruitland clays. Soils typically high in selenite. Elevation ~3900-6600 ft.	UNLIKELY: Mancos and Fruitland soils not identified within PAA.
FISH			
Colorado pikeminnow *(Ptychocheilus lucius)*	Endangered with Critical Habitat	Medium to large rivers. Shoreline habitat with sand substrate. Young prefer small, quiet backwaters; adults use various habitats (deep, turbid, strongly flowing water; eddies; runs; flooded bottoms; backwaters; lowlands - inundated during spring flow).	WOULD NOT OCCUR: No perennial water resources within immediate vicinity of PAA.
Razorback sucker *(Xyrauchen texanus)*	Endangered with Critical Habitat	Slow areas, backwaters, and eddies of medium to large rivers and their impoundments (preferably reservoirs).	WOULD NOT OCCUR: No perennial water resources within immediate vicinity of PAA.
Roundtail chub *(Gila robusta)*	Candidate	Historically occurred in the San Juan, Zuni, San Francisco, and Gila River drainages.	WOULD NOT OCCUR: No perennial water resources within immediate vicinity of PAA.
BIRDS			
Mexican spotted owl *(Strix occidentalis lucida)*	Threatened with Critical Habitat	Old growth or mature forests with complex structural components (uneven aged stands, high canopy closure, multi-storied levels, high tree density). Prefer canyons with riparian or conifer habitats. Nesting: trees, cliff ledges, or caves.	UNLIKELY: No complex forests or canyons within immediate vicinity of PAA.
Mountain plover *(Charadrius montanus)*	Proposed Threatened	Short-grass plains, sandy desert, and agricultural lands. Nesting: areas with short vegetation, significant areas of bare ground, and flat or gentle slopes. Often associated with prairie dog colonies. Winter: Out of region.	UNLIKELY: No short-grass prairie, agricultural fields, sandy desert, or prairie dog colonies within PAA.
Southwestern willow flycatcher *(Empidonax traillii extimus)*	Endangered with Critical Habitat	Breeding: Dense, riparian habitats. Winter: Out of region.	UNLIKELY: No riparian areas within immediate vicinity of PAA.

Species	Federal Status	Habitat	Potential to Occur in Proposed Action Area (PAA)
Yellow-billed cuckoo *(Coccyzus americanus)*	Candidate	Breeding: Tall cottonwood, mature willow riparian, or deciduous woodlands; moist thickets; orchards; or overgrown pastures. Winter: Out of region.	UNLIKELY: No cottonwood, riparian, or deciduous woodlands; moist thickets; orchards; or overgrown pastures within immediate vicinity ofPAA.
MAMMALS			
Black-footed ferret *(Mustela nigripes)*	Endangered	Grasslands, steppe, and shrub steppe. Closely associated with prairie dog colonies (preferably colonies larger than 80 hectares).	UNLIKELY: No prairie dog colonies recorded or observed within immediate vicinity of PAA.

Based on habitat and range, the potential does not exist for any Federally listed species to occur within the proposed action area.

3.8 Invasive, Non-Native Species

Management of invasive and non-native species is mandated under the Lacey Act, as amended; the Federal Noxious Weed Act of 1974, as amended; and Executive Order 13112, Invasive Species (February 3, 1999). lnvasive plants are found in the San Juan Basin, particularly in areas disturbed by surface activities. These plants displace native plant communities and degrade wildlife habitat. A total of212 invasive and poisonous weeds have been identified on public land administered by the BLM-FFO (Heiland White 2000).

No Federally listed noxious or invasive weed species were observed within the proposed action area. Cheatgrass *(Bromus tectorum),* a New Mexico-listed Class C noxious weed, is found within the proposed action area. Class C species are widespread in the state. Management decisions for these species are determined at the local level, based upon feasibility of control and level of infestation. Russian thistle *(Sa/sola iberica)* is quite thick within previously disturbed sections of the proposed well pad; though not federally or state-listed, this species is known to outcompete native species throughout the Four Corners.

3.9 Mineral Resources/Geology

The San Juan Basin holds the second largest accumulation of natural gas in the country in Upper Cretaceous sandstone reservoirs of the Pictured Cliff, Mesa Verde Group, Gallup, and Dakota sandstone. These Cretaceous formations deposited in marine environments in the Western Interior Seaway are conventional sources of natural gas, and range in depth from 2500 to 8000 feet throughout the basin. Most wells permitted in the New Mexico portion of the basin are conven ionar-New Mexico alone provides approximately 95 percent of tne-San Jmm Basin production.

Coalbed methane is a more recent development of an unconventional source of natural gas, in that the natural gas is methane associated with coal beds found in the Upper Cretaceous Fruitland Formation. The Fruitland and overlying Kirtland Formations both contain coal beds that are mined for coal-fired power plants. Coalbed methane wells tend to be shallower, especially along the northeastern edge of the basin, and thus extract large amounts of produced water during

production. Coal seam sources contribute more than 60 percent of the basin total output, with New Mexico accounting for approximately 53 percent of the volume.

Surface geology within the proposed action area is the Nacimiento Formation. This formation consists of a sequence of varicolored beds of sandstone and mudstone as thick as 1500 feet. The type section for the formation is at Cuba, New Mexico (originally named Nacimiento). Near Cuba, the lower part of the Nacimiento consists of interbedded black, carbonaceous mudstones and white, coarse-grained sandstone. Further north, near Kutz Canyon and Angel Peak, the upper part of the formation consists of gray, green, and red mudstones and white and buff-colored, coarse-grained sandstones. Its thickness ranges from 420 to 2300 feet.

The Nacimiento was deposited in a series of channel sandstones with floodplain and overbank stream environments. The Nacimiento Formation is very widespread in outcrop. It extends from the east side of the La Plata River to Aztec, and south to Nageezi and Huerfano. It is widespread near the communities of La Plata and Aztec.

3.10 Soils

The San Juan Basin is bordered by the Defiance Uplift and Chuska Mountains to the west, San Juan Dome to the north, Chaco Slope and Zuni Uplift to the south and Nacimiento Uplift to the east. In total, the San Juan Basin covers a surface of approximately 4600 square miles. The soils in the San Juan Basin were formed primarily from two kinds of parent material: alluvial sediment and sedimentary rock. The alluvial sediment is material that was deposited in river valleys and on mesas, plateaus, and ancient river terraces. The material has been mixed and sorted in transport and has a wide range of mineralogy and particle size. Sedimentary parent material consists mainly of sandstone and shale bedrock. These shale and resistant sandstone beds form prominent structural benches, buttes, and mesas bounded by cliffs.

The Soil Conservation Service (now the Natural Resource Conservation Service [NRCS]) has surveyed the soils in the proposed action area. Complete soil information is available in the Soil Survey of San Juan County, New Mexico, Eastern Part, developed by the United States Department of Agriculture, NRCS.

Soils of the proposed action area are mapped as the Gypsiorthids-Badlands-Stumble complex, moderately steep. This unit is found on hills, knolls, and breaks and in valleys; slope is 5 to 30 percent. The unit is comprised of 35 percent Gypsiorthids, 5 to 30 percent slopes; 35 percent Badlands, 5 to 30 percent slopes; and 15 percent Stumble loamy sand, 5 to 8 percent slopes. The remaining 15 percent of this unit is comprised of small areas of Farb and Persayo soils on hills and breaks.

The Gypsiorthids portions of this soil unit have variable attributes and may be very shallow to deep. Available water capacity is very low to high, runoff is slow to medium, and water erosion is moderate. This soil is generally well drained, and formed in material derived dominantly from gypsum. Badland consists of nonstony, barren, shale uplands that are dissected by deep, intermittent drainageways and gullies. The Stumble soil is deep and somewhat excessively drained. It formed in alluvium derived dominantly from sandstone and shale. Typically, the surface layer is yellowish-brown and pale brown, loamy sand. Permeability is rapid, available water capacity is low, runoff is very slow, and the hazard of water erosion is slight. The potential plant communities in this soil unit include Indian ricegrass, giant dropseed, alkali sacaton, and bottlebrush squirreltail.

3.11 Watershed/Hydrology

The proposed action area is within the Animas Watershed. Drainage from within the proposed action area would flow generally southwestward, toward an unnamed drainage located south of Highway 173. From this point, the drainage flows westward for 1.0 mile into Hampton Arroyo. Hampton Arroyo subsequently flows northwestward approximately 1.6 miles into the Animas River.

The Animas River is a major tributary of the San Juan River. The headwaters of the Animas River are located above 12,000 feet in the San Juan Mountains north of Silverton, Colorado. Major tributaries of the Animas River in New Mexico are Ditch, Miller, Rock, and Hart Canyons from the east and Cox, Kiffen, Tucker, and Bohanan Canyons from the west. These canyons, many arroyos, and numerous ephemeral drainages primarily contribute to the Animas River through spring runoff and summer flood events. The Animas River flows into the San Juan River in Farmington, New Mexico. The New Mexico portion of the Animas Watershed is bounded on the north by the Colorado stateline, on the south by its entry into the San Juan River, on the west by the ridge east of Farmington Glade, and on the east by the eastern edge of the Mesa Mountains. Landowners along its course consist of private individuals and public agencies.

3.12 Vegetation/Fqrestry

The proposed action area is located on the periphery of open pinon-juniper woodland and sagebrush shrubland habitats. The southeastern portion of the proposed action area consists of sagebrush *{Artemisia tridentata)* and desert scrub species with scattered pinon pine *(Pinus edulis)* and juniper *(Juniperus* sp.) trees. A P&A well pad overlaps this portion of the well pad; this P&A pad has become partially revegetated with desert scrub species and sagebrush. Russian thistle is common on and around the P&A pad and active access road. The northwestern portion of the proposed action area consists of open pinon-juniper woodland. Dominant understory species include broom snakeweed *((Gutierrezia sarothrae),* Indian ricegrass *((Achnatherum hymenoides),* and narrowleaf yucca *(Yucca angustissima).* There are approximately I00 trees within the proposed action area. Ground cover within the proposed action area ranges from 20 to 60 percent. Additional details regarding vegetation within the proposed action area are provided in the Biological Survey Report (BSR) in Appendix E.

3.13 Wildlife

The proposed action area is within New Mexico Department of Game and Fish (NMDGF) Management Unit 2A. The NMDGF monitors big game population trends in the area. Depending on winter weather conditions and snow depths, mule deer *(Odocoileus hemionus)* and elk *(Cervus e/aphus)* migrate to their winter ranges from high elevations during late November and December, and migrate back to summer ranges in March or April. Twenty-five years ofNMDGF aerial survey information for Unit 2 indicates that mule deer and elk winter populations have fluctuated over the years, but no evident trend seems apparent in the proposed action area. Deer -number countedii"J)pear-nr-be most-strongly linked with-the severity-of-winter-conditions. The data does not appear to support any cause or effect relationship between wintering deer populations and the level of oil and gas development. Elk numbers also fluctuate with severity of winter, but general trends observed over the years, combined with the professional observations of BLM-FFO staff, indicate that elk use and resident elk populations have expanded in the BLM-FFO jurisdictional area during the past 25 years (BLM unpublished file records).

Mule deer scat and tracks, large mammal bones, canine tracks, rabbit scat, and small to large mammal burrows were observed during the biological survey (Appendix E). No sign of prairie dogs was seen; no prairie dog colonies are recorded within the vicinity of the proposed action area.

3.14 Migratory Birds

The Migratory Bird Treaty Act (MBTA) 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 MBTA, 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 MBTA. 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 two years, a Memorandum of Understanding (MOU) with the USFWS 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 the elements in that agency's formal planning process (such as revision of agency land management plans), including public participation and NEPA analysis as appropriate.

A National MOU between the BLM and the Service was signed on April 12, 2010. Included in the MOU is the stipulation that the BLM evaluate effects of projects on migratory birds. The BLM should identify where take may have a measurable negative effect on populations, focusing first on species of concern, priority habitats, and key risk factors. The BLM would then implement approaches to lessen such take.

The BLM-FFO has consulted the Partners in Flight Bird Conservation Plan for the State of New Mexico and the USFWS's list of Birds of Conservation Concern. A review of these documents, specifically as they pertain to the Colorado Plateau physiographic area, indicates there are seven (7) "priority" avian species that utilize the pinon-juniper habitat type and seven (7) species that utilize the Great Basin desert shrub habitat type. The selected species have a known distribution in the BLM-FFO area and may be affected by various types of perturbations. These species and a brief assessment of the effects of the proposed action on their habitat are as follows:

Table 4: Potential of Priority Migratory Birds (with a Known Distribution in the BLM-FFO Area) to Occur in Proposed Action Area

Species	Habitat	Potential to Occur in Proposed Action Area (PAA)
Ash-throated flycatcher *(Myiarchus cinerascens)*	Arid and semiarid scrub, open woodland, pinon-juniper and riparian woodlands.	POSSIBLE: PAA is on edge of open pifion-juniper woodland.
Bendire's thrasher *(Toxost oma bendirei)*	tlrushy deserf, especially areas otfall vegetation, cholla cactus, creosote bush, and yucca.	UNLIKELY: No brushy desert areas with appropriate vegetation found within PAA.
Black-throated gray warbler *(Dendroica nigrescens)*	Found in pine and mixed oak-pine woodlands.	POSSIBLE: PAA is on edge of open pifion-juniper woodland.
Black-throated sparrow *(Amphispiza bilineata)*	Xeric desert habitats dominated by shrubs with bare, open ground.	UNLIKELY: No xeric desert habitat within PAA.

Species	Habitat	Potential to Occur in Proposed Action Area (PAA)
Burrowing owl *(Athene cunicularia}*	Open grasslands or desert scrub; presence of suitable nest burrow is critical prerequisite (often prairie dog burrows).	UNLIKELY: No open grasslands or desert scrub within PAA; no prairie dog colonies or other suitable nesting burrows present within PAA.
Cassin's kingbird *(Tyrannusvociferans)*	Found in open country with scattered trees or open woodlands, including pinon-juniper.	POSSIBLE: PAA is on periphery of open woodlands and open country with scattered trees.
Gray flycatcher *(Empidonax wrightii)*	Prefers open pinon-juniper forest, often with interspersed ponderosa, with an understory of shrubs.	POSSIBLE: PAA is on edge of open piilon-juniper woodland.
Gray vireo *{Vireo vicinior)*	Found in desert scrub, mixed juniper or pif'ion pine and oak scrub associations, and chaparral, in hot, arid mountains and high plains scrubland.	POSSIBLE: PAA is on edge of open piilon-juniper woodland.
Juniper titmouse *(Baeolophus ridf(Wayi)*	Warm, dry open woodland, especially juniper woodlands.	POSSIBLE: PAA is on edge of open pinon-juniper woodland
Loggerhead shrike *(Lanius ludovicianus)*	Relatively xeric habitats dominated by shrubs and grasses.	POSSIBLE: PAA is on edge of sagebrush shrubland habitat.
Piiion jay *(Gymnorhinus cyanocephalus)*	Found in piilon-juniper woodland, sagebrush, scrub oak, and chaparral communities, and sometimes in pine forests.	POSSIBLE: PAA is on edge of open pif'ion:juniper woodland and sagebrush shrubland.
Sage sparrow *(Amphispiza belli)*	Sagebrush-grassland.	POSSIBLE: PAA is on edge of sagebrush shrubland habitat.
Sage thrasher *(Oreoscoptes montanu:.)*	Sagebrush plains.	POSSIBLE: PAA is on edge of sagebrush shrubland habitat.

A bluebird *(Sialia* sp.) was observed within the proposed action area during the biological survey. No nests were observed.

3.15 Range

There are 167 grazing allotments managed by the BLM-FFO, 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 (4) authorizations issued under section 15 of the Taylor Grazing Act to the Navajo Tribe that authorizes grazing on 35 allotments. There are an additional 30 section 15 authorizations that permit grazing on 30 allotments in the Lindrith, New Mexico area.

The proposed action area is located within BLM-FFO Grazing Allotment No. 5037, Knickerbocker Ranch, a 35,866-acre allotment currently leased to Knickerbocker Ranch, LLC. This allotment, which is 83-percent public, is leased for 2080 sheep from November 20 through April 20, annually. A total of 17.26 Federal Animal Unit Months (AUMs) are provided by this allotment. Thus, there are 20.8 acres per AUM within the allotment. No sign of livestock was observed during the biological survey. No livestock improvements are located within the proposed action area.

3.16 BLM-FFO Special Management Species

The BLM-FFO has prepared a list of SMS to focus species management efforts toward maintaining habitats under a multiple use mandate. The authority for this policy and guidance is

established by the Endangered Species Act of 1973, as amended; Title H of the Sikes Act, as amended; the Federal Land Policy and Management Act (FLPMA) of 1976; and Department of Interior Manual 235.1.1 A. BLM-FFO SMS are listed in the following table. Those species warranting further evaluation are discussed following the table.

Table 5: BLM-FFO SMS

Species	Habitat	Potential to Occur in Proposed Action Area (PAA)
Aztec gilia *(Aiiciella formosa)*	Sandy-clay hills of the Nacimiento formation, desert scrub habitat, elevation 5000-6400 ft.	POSSIBLE: PAA is within BLM-designated habitat "zone" for this species. Geology is !Nacimiento, elevation is between 5000 & 6400 ft.
Brack's fishhook cactus *(Sclerocactus cloveriae* var. *brackir)*	Sandy-clay hills of the Nacimiento formation, desert scrub habitat, elevation 5000-6400 ft.	POSSIBLE: PAA is within BLM-designated habitat "zone" for this species. Geology is Nacimiento, elevation is between 5000 & 6400 ft.
American peregrine falcon *(Falco peregrinus anatum)*	Rugged, semi-open to wooded areas, including open forests, farmlands, and cities. Nesting: Locally, typically ledges on vertical cliffs.	POSSIBLE: PAA is within open shrubland to open woodland habitat.
Bald eagle *(Haliaeetus leucocephalus)*	Typically within 2.5 mi of river or lake that supports fish or waterfowl, but may be in areas where other resources (such as carrion) available.	POSSIBLE: PAA is greater than 2.5 mi from river or lake that supports fish or waterfowl. However, bald eagles could potentially use the PAA for foraging.
Burrowing owl *(Athene cunicularia)*	Open grasslands. Nesting: abandoned animal burrows.	UNLIKELY: No open grasslands within PAA. No prairie dog colonies or other appropriate burrows within PAA.
Ferruginous hawk *(Buteo regalis)*	Open country, including prairies, bad lands, sagebrush shrubland, desert scrub, and the periphery of pif'ion-juniper woodlands. Nesting: lone trees, cliff ledges, rock spires, or powerline towers.	POSSIBLE: Sagebrush shrubland and piilon-juniper periphery habitat found within proposed action area.
Golden eagle *(Aquila chrysaetos)*	Open country, including open forests. Nesting: Cliff ledges or scattered large trees.	POSSIBLE: PAA is within open shrubland to open woodland habitat.
Mountain plover *(Charadrius montanus)*	Areas with very short vegetation, >30% bare ground, and flat to gentle slopes.	UNLIKELY: Habitat within PAA does not include very short vegetation or >30% bare ground.
Prairie falcon *(Falco mexicanus)*	Arid, very open areas, particularly areas with short vegetation, scrub habitat, or large areas of bare ground.	UNLIKELY: No short-grass habitat, scrub habitat, or large areas of bare ground within PAA.
Yellow-billed cuckoo *(Coccyzus americanus)*	Cottonwood woodlands, willow riparian woodlands, deciduous woodlands, moist thickets, orchards, or overgrown pastures.	WOULD NOT OCCUR: No cottonwood, riparian, or deciduous woodlands; moist thickets; orchards; or overgrown pastures within PAA.

According to the most recent BLM-FFO raptor nest GIS data, no active raptor nests are located within one-third mile of the proposed action area.

Aztec gilia *(Alicie/la formosa)* &
Brack's fishhook cactus *(Sclerocactus cloverae brackii)*
Aztec gilia and Brack's fishhook cactus occur on sandy-clay hills of the Nacimiento formation in desert scrub habitat. They are typically found between 5000 and 6400 feet in elevation (New Mexico Rare Plant Technical Council 2005).

The proposed action area is within the BLM-FFO-determined potential habitat "zone" for these species. The geology is Nacimiento and the elevation is approximately 6051 feet. Though the habitat is not generally desert scrub, there are many desert scrub species in the area. Ten-foot-wide pedestrian transect surveys were conducted within the proposed action area for these species. No evidence of either of these species was observed.

American peregrine falcon *(Falco peregrinus anatum)*
Peregrine falcons may be found in the region year-round (Wheeler 2003). Peregrine falcons prefer open habitats, such as tundra, moorlands, steppe, seacoasts, mountains, open forests, and human population centers (NatureServe 2010). In the interior U.S., during the summer, this species can be found in rugged, semi-open and wooded, often montane regions. They prefer areas with rocky cliffs, outcrops, and canyons (greater than 30-feet high) adjacent to Jakes, rivers, or streams. They often nest on ledges or holes on the faces of rocky cliffs (at least 30 feet high) or crags, on river banks, on tundra mounds, in open bogs, in tree hollows, in other species' large stick nests, and on man-made structures. Locally, nests are typically found on ledges of vertical rocky cliffs. During the winter, lower-elevation pairs may remain in summer breeding habitat, while higher-elevation or northern latitude pairs may move south or to lowland habitat that often lacks cliffs (Wheeler 2003).

The proposed action area could potentially provide foraging habitat for this species. There are no appropriate nesting sites within the proposed action area. The nearest peregrine falcon nest is 11 miles east-southeast of the proposed action area. No evidence of this species was observed during the survey of the proposed action area.

Bald eagle *(Haliaeetus leucocephalus)*
Bald eagles are typically found in northwestern New Mexico only during the winter (Wheeler 2003). They typically prefer habitat within 2.5 miles of coastal areas, bays, rivers, lakes, or other bodies of water that provide fish or waterfowl (NatureServe 2010). However, during the winter, if sufficient prey is available, eagles may be found in areas that lack water (Wheeler 2003). This species prefers to roost in conifers or other sheltered sites in the winter. Communal roost sites, used by two or more eagles, are common. Bald eagles typically avoid areas with nearby human activity and development (NatureServe 2010).

The proposed action area is more than 2.5 miles from the nearest waterbodies that provide fish or waterfowl. However, the proposed action area could potentially be used for foraging. No bald eagles were observed during the survey of the proposed action

area.

Ferruginous hawk *(Buteo regalis)*

Ferruginous hawks may be found in northwestern New Mexico year-round (Wheeler 2003). They are found in open country, primarily prairies, plains, badlands, sagebrush shrubland, saltbush-greasewood shrubland, desert, and the periphery of pinon-juniper or other woodlands (NatureServe 2010). They may also utilize lightly used cropland. Terrain ranges from flatlands to gently rolling hills to large hills to badlands. They prefer areas with trees, buttes, large boulders, or rock spires (Wheeler 2003). They avoid high elevations, forest interiors, narrow canyons, and cliff areas. They typically nest in tall trees or willows along streams or on steep slopes, on cliff ledges, on river-cut banks, on large boulders, on buttes, on rock spires, on hillsides, or on powerline towers. When trees are used for nesting, the trees are typically lone or peripheral rather than within densely wooded areas. Ferruginous hawks may also nest on sloped ground on the plains or on mounds in open desert. They generally avoid areas of intensive agriculture or human activity (NatureServe 2010). During the winter, this species may use agricultural and rural areas more often than during the summer (Wheeler 2003).

The proposed action area could potentially provide foraging habitat for this species. No nesting sites are available within the proposed action area. The nearest recorded ferruginous hawk nest is approximately 18 miles south of the proposed action area. No evidence of this species was observed during the field inspection of the proposed action area.

Golden eagle *(Aquila chrysaetos)*

Golden eagles may be found in northwestern New Mexico year-round (Wheeler 2003). Golden eagles are generally found in open country, including prairies, tundra, open wooded areas, and barren areas. They prefer hilly or mountainous regions (NatureServe 2010). They may be found in areas with light agricultural use, but are rarely found in rural areas. They prefer areas with elevated perches. Nesting birds will utilize embankments or cliffs, or flat to moderate areas with scattered large trees. During the summer, they may be found above timberline; in the winter, they are typically only found below timberline, and may be found in moderate agricultural areas (Wheeler 2003).

The proposed action area could potentially provide foraging habitat for this species. No nesting sites are provided within the proposed action area. The nearest golden eagle nest is approximately three miles to the southeast. No golden eagles or nests were observed during the biological survey of the proposed action area.

3.17 Recreation

The objective of the BLM-FFO outdoor recreation program is to ensure the continued availability of public lands for an array of resource-dependent recreation opportunities. Recreation use is managed to protect visitors, protect resources, resolve user conflicts, and stimulate the enjoyment of public lands. Recreation SDAs are managed to accommodate a large variety of recreational uses and outdoor recreational experiences. The proposed action area is not within a recreation SDA. BLM-FFO areas located outside of recreation SDAs are managed as Extensive Recreation Management Areas (ERMAs). ERMAs are managed to maintain a freedom of recreation choice with limited regulatory constraints. In ERMAS, few recreation facilities or supervisory efforts exist. Dispersed recreational use in ERMAs may include occasional hunting during the hunting

season.

The proposed well pad is located approximately 600 feet east of Kart Kanyon Speedway, an outdoor dirt-racing track. Dirt bike tracks, shotgun shells, and trash are found within and surrounding the proposed action area, indicating that the proposed action area is being used by recreationists.

3.18 Visual Resources

The BLM has developed a Visual Resource Management (VRM) classification designed to maintain or enhance visual qualities and describe the different degrees of modification to the landscape. The proposed action area is within VRM Class IV. Class IV allows for major modifications of the characteristic landscape and the level of change in the basic landscape elements due to management activities can be high (RMP/FEIS 2003).

There *are* existing access roads, pipeline ROWs, powerlines and well pads in the immediate vicinity of the proposed action area. The proposed action area is visible from houses to the west, Kart Kanyon Speedway to the west, and New Mexico State Highway 173 to the south.

3.19 Noise

Increases in the level of sound generated from the production and pipeline transportation of oil and gas has occurred in the San Juan Basin over the last several years. These increases *are* generated primarily from the escalating need to use equipment such as compressors and pumping units, which operate on a continual basis. The increase in noise affects natural resource values and management of a number of agency SDAs, ACECs, research natural areas (RNAs), etc. The proposed action *area* is not within an SDA, ACEC, or RNA. During the biological survey, dirt bikes on nearby Kart Kanyon Speedway were clearly heard.

3.20 Paleontology

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

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

The Nacimiento Formation, found within the proposed project area, has the potential to contain several important vertebrate fossil . Fossils could occur -within or proximate to the proposed action area.

LO Environmental Consequences

Effects can be long term (permanent or residual) or short term (incidental or temporary). Short-term impacts affect the environment for only a limited period of time; the environment reverts to pre-action conditions (usually within one to three years). Long-term effects are substantial and permanent alterations to the pre-existing environmental condition; the effects last longer than three years.

Alternative A- No Action Alternative

Under the No Action Alternative, neither Alternative B nor an alternative location for the proposed well would be realized. The No Action Alternative would result in the continuation of the current land and resource uses in the action area. The No Action Alternative would result in no effect to each resource discussed within this section. No mitigation would be required.

Alternative B - Proposed Action

Under the proposed action, all proposed actions listed, including site-specific mitigation measures, would occur. For a complete description of the proposed action, see Section 2.2, Alternative B – Proposed Action. The proposed action would result in 2.75 acres of new surface disturbance. Following interim reclamation, 1.00 acre of long-term surface disturbance would remain. The table below summarizes the long- and short-term disturbance resulting from the proposed action.

Table 6: Summary of New Disturbance

Facility	Acreage of New Disturbance- Short term	Acreage of New Disturbance – Lone term	Total New Distqrbance Acreage
Well pad	1.74	1.00	2.74
Pipeline Tie	0.01	--	0.01
TOTALS	1.75	1.00	2.75

Potential disturbance resulting from the proposed action has been divided into three categories:

	As defined in CEQ guidelines (40 CFR 1500-1508), effects that are substantial in severity and therefore should receive the greatest attention in decision-making.
Moderate	Effects that cause a degree of change that is easy to detect, but that do not meet the criteria for significant impacts.
	Effects that cannot be easily detected and cause little change in the existing environment.

4.1 Air Quality

4.1.1 Direct and Indirect Effects

Air Quality

Air quality would temporary be directly impacted with pollution from exhaust emissions, chemical odors, and dust caused by motorized equipment used during construction, and by the drilling rig during well-drilling. Dust dissemination would discontinue upon completion of the construction phase. Air pollution from the motorized equipment would discontinue at the completion of the drilling phase. The winds that frequent the northwestern part of New Mexico generally disperse the odors and emissions. Other factors that currently affect air

quality in the area include dust from livestock-herding activities, recreational use, and vehicles on roads.

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

Potential impacts of development could include increased airborne soil particles blown from new well pads or roads; exhaust emissions from drilling equipment, compressors, vehicles, and dehydration and separation facilities; and 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 BLM-FFO RMP demonstrated that 522 wells would be drilled annually for federal minerals. Current APD-permitting trends within the BLM-FFO confirm that these assumptions are still accurate. This level of exploration and production would contribute a small incremental increase in overall hydrocarbon emissions, including GHGs, NOx; and VOCs, released into the planet's atmosphere. When compared to total national or global emissions, the amount released as a result of potential production from the proposed well would not have a measurable effect on climate change due to uncertainty and incomplete and unavailable information; therefore, it is not possible to determine the effects on climate change on a regional, national, or global scale.

Consumption of oil and gas developed from the proposed well is expected to produce GHGs, NOx and VOCs. Consumption is driven by a variety of complex interacting factors, including energy costs, energy efficiency, availability of other energy sources, economics, demography, and weather or climate. Regional and global transportation, metropolitan traffic, fires (including wildfires, controlled burns, and use of domestic fireplaces), and power plant emissions from the west are also parts of the equation. In August 2006, regional air quality modeling conducted for the Northern San Juan Basin Coal Bed Methane FEIS Project determined that potential cumulative visibility impacts to Federal Prevention of significant Deterioration (PSD) Class I A-.eas (Mesa Verde National Park11ndthe Wenimuche Wilderness Area) could occur at some unspecified time in the future

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

Climate

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

4.1.2 Mitigation

The BLM-FFO has been a participant in the Four Corners Air Quality Task Force (FCAQTF) since its inception in 2002, when it was known as the Four Corners Ozone Task Force. Because of the unanswered questions raised by modeling efforts, the FCAQTF has continued to look at air quality issues in the Four Comers region. The FCAQTF is comprised of a broad base of representatives including federal, state, Indian, and local governments; 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 regulations, 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 FEISIRMP 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 COA, which has been in effect since August 1, 2005. To date, NMAQB has made no other such requests.

Currently, development of 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 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 0.07()-ppm. T-he-design-value-for-the county-must-be–greater-than the revised 8-hour ozone standard of0.075 ppm for a nonattainment designation.

The EPA's inventory data describes "Natural Gas Systems" and "Petroleum Systems" as the two major categories of U.S. sources of GHG gas emissions. The inventory identifies the contributions of natural gas and petroleum systems to total CO_2 and C emissions (natural gas and petroleum systems do not produce noteworthy amounts of any of the other GHGs). Within the larger category of "Natural Gas Systems," the EPA identifies

emtsstons 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 flaring hydrocarbons and gases at high temperatures in order to reduce emissions of incomplete combustion, requiring that vapor recovery systems be maintained and functional in areas where petroleum liquids are stored, ensuring that compressor engines 300 horsepower or less have NOx emissions limited to 2 grams per horsepower hour, revegetating areas not required for production facilities to reduce the amount of dust, and watering dirt roads during periods of high use in order to reduce fugitive dust emission. The significant threshold for particulate matter of35 ug/m^3 daily PM2.5 NAAQS is not expected to be exceeded under the proposed action.

The EPA data sows that improved practices, improved 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 BLM-FFO will work with industry and NMAQB to help facilitate the use of the relevant BMPs for operations proposed on federal mineral leases where such mitigation is consistent with agency policy.

4.2 Surface and Groundwater Quality and Quantity

4.2.1 Direct and Indirect Effects

The disruption of area soils and the increase of barren surface associated with the proposed well pad would result in augmented surface flows with associated increased sedimentation and TDS. Sedimentation, resulting from both wind and water erosion, could be realized downgradient of the proposed action area. The quality and quantity of this surface sedimentation would be dependent upon wind and water events in relation to soil disturbance, the timing and success of reclamation, and erosion control configuration. There would be low short- and long-term effects on surface water resources.

The storage of drilling fluids and improper well casing and cementing represents the potential for seepage of petroleum products to groundwater aquifers, such as the local San Jose Formation. Accidental spill or discharge of drilling and production fluids stored onstte is also a latent hazar , asoisplaced fluids could mtgrate to surface or groundwater resources. There would be moderate short- and long-term effects on groundwater.

4.2.2 Mitigation

Fresh water for drilling and completion would be trucked to the location from permitted sources. Fluids stored on location or associated with the pipeline would be contained in tanks during all operations. Large, permanent storage tanks(s) would be enclosed within compacted, gravel-covered, earthen berms to contain any potential spills. All pits would be lined. Lining and berming would prevent fluid seepage into washes, surface water, or shallow groundwater. Surfaccasing would be set at a depth specified by the BLM-FFO to protect shallow groundwater aquifers. The swift implementation of mitigation measures outlined for soils, topography, and vegetation would also curtail short- and long-term impacts to surface and groundwater quality and quantity. Re-establishment of perennial vegetation and installation of functional erosion-control devices outlined in BLM BMPs would decrease long-term soil erosion impacts and, consequently, impacts to surface and groundwater resources.

4.3 Hazardous or Solid Waste Materials

4.3.1 Direct and Indirect Effects

Typical wastes associated with the proposed action would include trash, sewage, produced water, and produced hydrocarbons. With mitigation, impacts are expected to be low for the short and long term.

4.3.2 Mitigation

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 pits during completion work. All waste would be disposed of in a proper manner as required by Federal and State law, as described in the COAs.

When significant amounts of chemicals are stored onsite, 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 site is required under CERCLA and BNLM NTL-3A. The well location would have an informational sign, as directed under 43 CFR 3160.

4.4 Environmental Justice/Socio-Economics

4.4.1 Direct and Indirect Effects

Local and regional companies may be employed during construction, drilling, and production of the proposed well and associated facilities. This employment would result in an economic benefit to the local and regional community. No disruptions or disproportionate negative impacts to any communities or groups are anticipated. A moderate, short-term increase and low, long-term increase in socio-economics is anticipated.

4.4.2 Mitigation

No mitigation is proposed.

4.5 Cultural Resources

4.5.1 Direct and Indirect Effects

Direct effects normally include alterations to the physical integrity of a cultural resource. If a cultural resource is significant for other than its scientific information, direct effects may also include the introduction of audible, atmospheric, or visual elements that are out of character for the cultural site. A potential indirect effect from the proposed action is the increase in human activity or access to the area with the increased potential of unauthorized removal or other alteration to cultural resources in the area. Based on a review of the archaeological reports and the assessment of the undertaking in this area, the BLM cultural resources staff has determined that the proposed action, with mitigation, would have no effect on cultural resources (BLM Report No. 201l[IJI]025F). This determination would be included with the BLM-FFO cultural resources stipulations, if any, attached to the APD.

4.5.2 Mitigation

No site-specific mthgation is recommended for the proposed action. All BLM-FFO cultural resources stipulations would be followed as indicated in the Cultural Resource Records of Review, attached to the APD. These stipulations may include, but are not limited to, temporary or permanent fencing or other physical barriers, monitoring of f?arth disturbing construction, project area reduction and/or specific construction avoidance zones, and employee education. All employees, contractors, and sub-contractors of the project would be informed by the project proponent that cultural sites are to be avoided by all personnel, personal vehicles, and company equipment, and that it is illegal to collect, damage, or disturb cultural resources, and that such activities are punishable by criminal and or administrative penalties under the provisions of the Archaeological Resources Protection Act (16 U.S.C. 470aa-mm).

In the event of a new discovery during construction, the project proponent would 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 would be protected in place until mitigating measures can be developed and implemented according to guidelines set by the BLM.

4.6 Native American Religious Concerns

4.6.1 Direct and Indirect Effects

The proposed action is not known to physically threaten the integrity of any TCPs, prevent access to sacred sites, prevent the possession of sacred objects, or interfere or otherwise hinder-the—performance of tradit1onal ceremonies and rituals pursuant to AlRFA or EO 13007. There are currently no known threats to remains that fall within the purview ofNAGPRA or ARPA.

4.6.2 Mitigation

No mitigation is proposed.

4.7 Federally Listed Threatened or Endangered Species

4.7.1 Direct and Indirect Effects

Based on habitat and range, the potential does not exist for any Federally listed species to occur within the proposed action area. No Federally listed.species were observed during the survey of the proposed action area. As required under Section 7 of the Endangered Species Act of 1973, the BLM-FFO submitted a Biological Assessment (BA) to the U.S. FWS in association with the BtM-FFO 2003 Draft RMP/Draft EIS. This assessment described the potential impacts on threatened and endangered species, as a result of management actions presented in the BLM-FFO Draft RMP/Draft EIS. In a letter dated October 2, 2002, the USFWS concurred with the BLM-FFO (Consultation No. 2-22-01-389). The USFWS states:

> "The [USFWS] concurs with the BLM's determination in the BA of "may affect, not likely to adversely affect" Knowlton cactus, Mesa Verde cactus, Mancos milkvetch, Colorado pikeminnow and its critical habitat, razorback sucker, bald eagle, mountain plover, Mexican spotted owl and its critical habitat, and the southwestern willow flycatcher."

No further consultation with the USFWS is required.

4.7.2 Mitigation

No mitigation is proposed.

4.8 Invasive, Non-Native Species

4.8.1 Direct and Indirect Effects

Indirect effects of increased human traffic in the area, especially any interstate traffic, may result in establishment of invasive/noxious weeds. Invasive/ noxious plants generally outcompete native species where bare ground is created. Given successful mitigation measures, effects from invasive, non-native species are expected to be low for the short and long term.

4.8.2 Mitigation

The proposed action area would be seeded with certified weed-free seed. It would be Burlington's and Williams' responsibility to monitor, control, and eradicate all noxious/invasive weeds within the proposed action area during the life of the project.

4.9 Mineral Resources/Geology

4.9.1 Direct and Indirect Effects

— — Development of the Basin Dakota/Blanco Mesaverde reservoir would result in extraction of a non-renewable resource. Cross-contamination between geologic zones could occur without adequate cementing and casing of the proposed well bore. With implementation of BLM-FFO standard drilling and completion requirements, short- and long-term effects to mineral resources and geology are anticipated to be low.

4.9.2 Mitigation

Sufficient well-control equipment and reserve pit volume are necessary to ensure control of the well during drilling and completion operations. Adequate casing, cementing, mud weights, blow-out preventors, and reserve pit volumes are proposed in the APD to mitigate any potential down-hole impacts.

4.10 Soils

4.10.1 Direct and Indirect Effects

New disturbance associated with the proposed action would be approximately 2.75 acres; there would be approximately 1.00 acre of long-term disturbance. Soils that would be disturbed would be structurally mixed, displaced, and exposed to the elements of wind and water erosion. In some areas, these soils would also be compacted. Once disturbed, these soils (especially in cut-and-fill slope areas) can be subject to increased erosion, dependent upon storm events of water and/or wind, until reseeding has been established (one to two growing seasons). The heaviest erosion into the Watershed would be low for the short term until revegetation is established. The heaviest amounts of wind and water erosion would be low for the short and long term.

4.10.2 Mitigation

During interim reclamation, 1.75 acres of new disturbance would be reclaimed. Site-specific drainage and erosion mitigation measures for the well pad and associated facilities are detailed in Section 2.2 Alternative B- Proposed Action. Re-establishment of perennial vegetation and installation of functional erosion-control devices outlined in BLM BMPs would decrease long-term soil erosion effects.

4.11 Watershed/Hydrology

4.11.1 Direct and Indirect Effects

The proposed action would affect the Animas Watershed and its hydrology, as discussed in Section 4.2.1 Surface and Groundwater Quality and Quantity - Direct and Indirect Effects. With the implementation of mitigation measures described in Section 4.2.2 Surface and Groundwater Quality and Quantity- Mitigation, impacts to the Watershed and its hydrology would be low for the short and long term.

4.11.2 Mitigation

Mitigation measures described in Section 4.2.2 Surface and Groundwater Quality and Quantity – Mitigation would be applied to curtail impacts to the watershed and its hydrology.

4.12 Vegetation/Forestry

4.12.1 Direct and Indirect Effects

The proposed action would result in the disturbance of approximately 2.75 acres of sagebrush shrubland and open pinon-juniper woodland. Disturbance would require the removal of all vegetation within the limits of the proposed action area, including approximately 100 pinon and juniper trees. Following interim reclamation, the re-establishment of vegetation is expected to take three to five growing seasons, depending on precipitation. The re-establishment of mature pinon-juniper woodland would take

longer than five years. There would be 1.00 acre of long-term surface disturbance associated with the proposed action. With mitigation, the proposed action is projected to have moderate short- and long-term effects on area vegetation.

4.12.2 Mitigation

During interim reclamation, 1.75 acres of new disturbance would be reclaimed. BLM-FFO-designated seed mixture would be used.

4.13 Wildlife

4.13.1 Direct and Indirect Effects

The proposed action would result in the disturbance of approximately 2.75 acres of sagebrush shrubland and pinon-juniper woodland habitat. All vegetation within this acreage would be removed, including approximately 100 trees. Following interim reclamation, the re-establishment of vegetation is expected to take three to five growing seasons, depending on precipitation. The re-establishment of mature woodland habitat would be expected to take considerably longer than five years. There would be 1.00 acre of new, long-term surface disturbance.

Effects of oil and gas development on terrestrial flora and fauna can result from dust, noise, increased human activity due to greater road access, and habitat fragmentation (BLM 2003b). Some wildlife species react positively to certain oil and gas activities, some react negatively, and some show no reaction at all. Species would continue to inhabit the area or conversely move out of the area, and populations may increase or decrease depending on the available adjacent forage and habitat present.

Increased vehicular traffic and human activity in the area could have a negative impact due to disturbance and potential road kills to big game and other wildlife species, especially during construction and drilling. Light truck traffic would continue yearlong, at approximately the present level following construction and drilling. There are no published studies of effects of oil and gas development on deer or elk in the San Juan Basin. Recent research in other areas may or may not be applicable. Sawyer et al. (2005) examined winter habitat selection of mule deer before and during development of a natural gas field, in the sagebrush and sagebrush-grassland communities of the Pinedale Anticline Action area of Wyoming. Results of this study recorded mule deer avoidance of otherwise suitable habitats within 2.7-3.7 kilometers of natural gas wells and suggested substantial indirect habitat Joss from energy development. Observed shifts in deer distribution as the study progressed were toward less-preferred and presumably Jess suitable habitats Sawyer et al (2005) conducted their study in an area of extensive rolling sagebrush with little topographic relief, high deer populations, and little oil and gas development. The high level of existing development in the BLM-FFO, as well as the ------more dtverse nabitat types andoTol<en topography, make assumptions of s1m11arimpacts difficult.

The BLM-FFO area contains approximately 633,000 acres of pinon-juniper habitat (BLM 2003b). The woodland habitat may offer greater cover and seclusion for wintering wildlife than in the aforementioned study. Road densities within the BLM-FFO area are already approximately 10 times greater than those in the Wyoming study, yet the area still supports deer and elk populations.

With implementation of proposed mitigation measures, direct and indirect wildlife effects are anticipated to be low for the short and long term.

4.13.2 Mitigation

All construction acttvtttes would be confined to permitted areas only. All wildlife hazards associated with construction and operation would be fenced or contained in storage tanks. During interim reclamation, 1.75 acres of new disturbance would be reclaimed. Following interim reclamation, cover reestablishment would minimize impacts to wildlife. BLM-FFO-designated seed mixture would be used during interim and final reclamation.

4.14 Migratory Birds

4.14.1 Direct and Indirect Effects

The proposed project would remove approximately 2.75 acres of sagebrush shrubland and open pinon-juniper woodland habitat, including approximately 100 scattered pinon and juniper trees. These trees provide pyrches and nesting sites for birds. Following interim reclamation, the re-establishment of vegetation is expected to take three to five growing seasons, depending qn precipitation. The re-establishment of m ture woodland would be expected to take considerably longer than five years. There would be 1.00 acre of new, long-term surface disturbance.

Based on the information available from the North American Breeding Bird Survey routes, it appears that the likelihood of more than one migratory bird nest in the project area is low. No old nests left from the previous breeding season or other evidence of these species was detected during field visit. The amount of projected habitat removal is negligible when compared to the total amount of available habitat. Actual potential effects on birds in the proposed action area are difficult to predict. Ongoing studies have shown mixed effects of oil and gas development, including compressor noise, on nesting migratory birds. Frances and Ortega (2006 unpublished report to BLM) found no significant difference in nest density or nest success between sites with or without wellhead compressors. Some species, such as the black-chinned hummingbird and house finch, were more common on sites with compressors while others, such as the mourning dove and spotted towhee, appeared to either avoid or nest further from compressors. Holmes and King (2006) found that the sage sparrow had lower nest survival in an area with ongoing gas development, while the Brewer's sparrow had higher survival rates when compared with populations in an undeveloped control area.

With the implementation of any proposed mitigation measures, effects to migratory birds are anticipated to be moderate for the sh01t and long term.

4.14.2 Mitigation

The BLM-FFO Interim Management Policy regarding the Migratory Bird Treaty Act (per Instruction Memorandum No. NM-F00-2010-001, dated February 20▮0) establishes mitigation measures to minimize the possibility of unintentional take of migratory birds. For projects with less than 4.0 acres of vegcetative disturbance, should active nests be observed within the proposed action area, construction would cease and a BLM-FFO biologist should be contacted immediately.

Following drilling, 1.75 acres of new disturbance would be reclaimed. All construction activities would be confined to permitted areas only. Rapid and permanent vegetation and cover reestablishment would minimize impacts to migratory birds. All bird hazards associated with construction and operation of the proposed action would be contained in storage tanks.

4.15 Range

4.15.1 Direct and Indirect Effects

The proposed project surface disturbance would result in the temporary loss of 0.13 AUM and the long-term loss of 0.05 AUM. If the area is successfully and immediately revegetated following initial construction and following final abandonment, the proposed project may benefit livestock grazing by providing additional forage above the existing indigenous rate of production. Impacts to range and grazing livestock are anticipated to be low for the short and long term.

4.15.2 Mitigation

During interim reclamation, approximately 1.75 acres of new disturbance would be reclaimed. A)l hazards to livestock and wildlife would be fenced or contained. All project activities would be confined to permitted areas only. No livestock improvements would be impacted.

4.16 BLM-FFO Special Management Species

4.16.1 Direct and Indirect Effects

Although no Aztec gilia or Brack's fishhook cactus were encountered during the biological survey of the proposed action area, these plant species could have potentially become established in this area in the future. The proposed action would remove 2.75 acres of potential habitat for these species. Though 1.75 acres of the proposed disturbance would be reclaimed during interim reclamation, Aztec gilia and Brack's fishhook cactus would not be likely to grow in a reclaimed area for many years.

The American peregrine falcon, bald eagle, ferruginous hawk, and golden eagle could potentially use the proposed action area for foraging. Impacts of the proposed action would include changes in vegetation composition and a temporary increase in human intrusion into the area, which may affect the movements of prey species. This human intrusion would result in increased noise, dust, and vehicles.

Short- and long-term effects to SMS are expected to be low.

4.16-:2— Mitigati7'>1'r

No mitigation measures are proposed.

4.17 Recreation

4.17.1 Direct and Indirect Effects

The proposed well pad, its associated facilities, and its associated human activities would be visible and audible to recreationists, such as hunters and users of Kart Kanyon

Speedway. Recreationists would no longer be able to utilize the informal dirt bike routes within the proposed action area. However, based on the location of current tracks and the current existence of several well pads in the immediate vicinity, following construction, recreationists will skirt the proposed well pad and create new routes in the immediate area. The presence of the well would not be expected to interfere with hunting or other recreational activities. Given implementation of BLM-FFO standards, effects from the proposed action are anticipated to be low for the short and long term.

4.17.2 Mitigation

Rapid construction and reclamation would decrease the period of greatest visual impact. Using low-profile equipment painted Carlsbad Brown would lessen visual impacts (for safety purposes, some equipment or parts of equipment may be required to be painted other, appropriate colors). Noise stipulations would apply to the proposed action (see Appendix C). During interim reclamation, 1.75 acres of new disturbance would be reclaimed. The goal of reclamation would be to diminish evidence of cuts, fills, and flat well pad surfaces.

4.18 Visual Resources

4.18.1 Direct and Indirect Effects

The proposed action would result in the long-term removal of 1.00 acre of open pinon-juniper woodland and sagebrush shrubland, including approximately 100 trees. The proposed action would create visual scars on the landscape. The proposed action area would be visible from homes, Kart Kanyon Speedway, New Mexico State Highway 173, and general users in the area.

4.18.2 Mitigation

Rapid construction and reclamation would decrease the period of greatest visual impact. Using low-profile equipment painted Carlsbad Brown would lessen visual impacts (for safety purposes, some equipment or parts of equipment may be required to be painted other, appropriate colors). During interim reclamation, 1.75 acres of new disturbance would be reclaimed. The goal of reclamation would be to diminish evidence of cuts, fills, and flat well pad surfaces.

4.19 Noise

4.19.1 Direct and Tndirect Effects

During project construction, short-term noise within the VICinity would moderately increase. Noise impacts during the construction phase would result from the operation of vehicles and construction equipment. Not all construction equipment operates continuously, so the average noise level during well pad and pipeline construction is estimated to be-ss dBA. Althuugh Illodified–by-topography;"--the average-noise levei decrease below 55 dBA about 1,700 feet from construction sites (SJPLC 2006). Generally, any areas within I,500 feet of construction would experience temporary noise levels above 55 dBA during daylight hours. Nighttime noise levels are not usually affected, because construction occurs between 7:00a.m. and 7:00 p.m. Noise during the drilling phase would also be elevated above pre-existing levels. Subject to area topography, typically the noise from a drilling rig is 74 dBA at 200 feet. Noise from drilling rigs would decrease from 60 dBA at I,000 feet to 50 dBA at 3,000 feet (SJPLC

2006). These levels are experienced for 24 hours per day for the time required to drill and complete the proposed well.

Under the proposed action, noise levels would decrease substantially after the well pad and pipeline tie have been constructed and the well drilled. Sources of operational noise would involve periodic vehicle trips to the well sites and the operation of production equipment. Subject to topography, typical noise from a pumping unit is 6ldBA at 100 feet for up to 24 hours per day. Noise from pump jacks would decrease to 55 dBA at 200 feet and 41 dBA at 1,000 feet. The noise from a pump jack is rhythmic, rather than the steady sound of smoothly running equipment. Therefore, although the noise level would be well below the 55-dBA significance threshold, it may be perceived as higher noise levels for some people. Noise from one (1) compressor engine enclosed in a building is about 89 dBA at five (5) feet. Noise from a compressor engine enclosed in a building typically is 69 dBA measured 50 feet from the edge of the building (SJPLC 2006). Therefore, under the proposed action (Alternative B), a moderate short-tenn noise increase in both the project and existing road area is anticipated. Given the implementation of the mitigation measures under the proposed action, during the production phase area noise would be low for the long tenn.

4.19.2 Mitigation

The BLM-FFO may require sound abatement on any production equipment used during the production phase of the proposed action. If so, all proposed activities would be required to comply with the noise standards as established in NTL 04-2 FFO (Appendix C).

4.20 Paleontology

4.20.1 Direct and Indirect Effects

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

4.20.2 Mitigation

All BLM-FFO paleontological resources stipulations would 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, action area reduction and/or specific construction avoidance zones, and employee education. Upon review, a detennination for final project clearance and stipulations would be issued by the BLM-FFO.

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

notified. The site would then be evaluated. Mitigation measures such as data recovery may be required by the BLM to prevent impacts to newly identified paleontological resources.

4.21 Residual Effects

The effects of the proposed action that remain after mitigation are residual impacts. Residual impacts of the proposed action include effects to local air quality by increased combustion emissions, changes in site topography, changes in soil constitution, and changes in vegetation composition. Combustion emissions may increase during the production phase of the proposed project. The proposed action would result in 1.00 acre of new, long-term surface disturbance. Areas of disturbance would be unlikely to support the growth of Aztec gilia and Brack's fishhook cactus for many years following reclamation. An unquantified amount of increased soil loss, erosion, sedimentation, and degradation of surface water quality and quantity would result. Additionally, the potential for the loss of cultural materials or paleontological resources exists, primarily as a result of indirect human actions. The proposed action would alter the landscape and increase visual scarring in the area surrounding the proposed well. Noise in the vicinity of the proposed well would increase for the short term. Long-term vicinity noise may also increase, dependent upon the production equipment utilized. To keep all impacts below the level of significance, implementation of recommended APD COAs would be necessary.

4.22 Cumulative Effects

The leased area of the proposed action has been industrialized with oil and gas well development. For each project that has been permitted, there has been an increase in long-term surface disturbance and fragmentation. As wells become unproductive, well pads and access roads are reclaimed. Thus, cumulative impacts fluctuate with the construction and reclamation of well pads and facilities. Preserving as much land as possible and applying appropriate mitigation measures would alleviate the cumulative impacts.

Within a one-mile radius of the proposed action area, there are 33 new or active wells on 29 well pads, and approximately \1.6 miles of existing roads. Assuming an average disturbance area of 1.2 acres per well pad and an average road width of 30 feet, this totals 42.2 acres of existing disturbance in the area. The proposed action, with 1.00 acre of long-term disturbance, would increase long-term disturbance in the region by 2.4 percent.

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

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

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

The foremost past, present, and potential future human activities resulting in environmental disturbance in the Animas Watershed are urban development and oil and gas development. Other human activities within the sub-watershed include hunting, general public recreation, and livestock grazing operations. Impacts from these activities on the An'imas Watershed environment are categorized as low, for the present and future (long-term). Energy development activities can be separated into short- and long-term disturbances. Short-term disturbance consists of pipeline routes and reclaimed portions of well pads. This acreage is usually reclaimed within one to two years. Long-term acreage disturbance are those areas needed for well production and vehicular travel (roads), estimated at one acre per well location. Some wells are twinned, or share a well pad location, decreasing the long-term surface acreage requirement. For this analysis, it is assumed that reclamation and mitigation measures have been successful, with each past, present and future well representing an estimated 0.78 acre per well.

The Animas Watershed contains approximately 144,584 acres with an estimated 1,751 existing oil and gas wells and 8,668 acres of existing long-term oil and gas disturbance (2003 PRMP/FEIS). Given the current NMOCC spacing orders of 18 wells per section, the "twinning" of some wells and the reasonable foreseeable development predictions in the 2003 PRMP/FETS, the total, existing, and projected, number of wells in the Animas Watershed is estimated at 2,003. The difference between the number of existing wells and the predicted wells is estimated at 452. This can be taken as a reasonable anticipated future development. Given that the existing roads are adequate, this calculates to approximately 353 additional acres of future long-term well pad development that can be realized in the Animas Watershed. The total long-term reasonable foreseeable long-term development disturbance would be approximately 9,020 acres. The proposed action, with 1.00 acre of long-term disturbance, would represent 0.01 percent of this disturbance.

The short-term use of the area for the proposed action is not expected to adversely impact or limit the long-term productivity of the land, or nearby lands. There is no irreversible or irretrievable commitment of surface resources that would occur from the proposed action.

5.0 Consultation/Coordination

The following agencies and individuals contributed to the preparation of this document:

BLM-FFO
- Jim Copeland- BLM-FFO Archaeologist
- Mike Flaniken – BLM-FFO Environmental Protection Specialist
- Sherrie Landon – BLM-FFO Paleontologist

Burlington
- Steven Merrell

WCRM
- Charles W. Wheeler
- Rebecca R. Smith
- Thomas J. Lennon
- Sarah M. Morgan
- Michael J. Proper

Nelson Consulting, Inc. has prepared this environmental assessment document to the staQdards and guidelines set by the BLM-FFO. Selected sections and information within this document were specifically written by the BLM-FFO. This document is the property of the BLM-FFO.

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APPENDIX A

Selected Laws & Regulations Governing Federal Oil & Gas Development

SELECTED LAWS AND REGULATIONS THAT GOVERN FEDERAL OIL AND GAS DEVELOPMENT

LAW/REGULATION	RESOURCE PROTECTED	AUTHORITY
Clean Air Act (CAA)	Air Quality, Air Emissions and Permits.	New Mexico Environment Depru (NMED)
Clean Water Act (CWA) 1977, as amended. Section 404 F	Surface waters of the U.S., crossing/diversion ephemeral washes	U.S. Army Corps of Engineers
Federal Water Pollution Control Act and Section 404 oft	Discharges into surface waters from point sot	New Mexico Water Quality Con Commission (NMWQCC)
Storm Water Pollution Prevention Plan (SWPPP), Section theCWA	Construction projects disturbing greater than Minimize erosion	USEPA
Safe Drinking Water Act 1974, as amended.	Surface and groundwater	U.S. Environmental Protection A (USEPA)
Colorado River Salinity Control Act 1974, amendment of Public Law 93-320	Mandated Control of Salinity Runoff into the Colorado River Basin	BLM
Federal Land Management and Policy Act (FLPMA) of I	BLM unique areas, ACECs. Issuing of energ ROWS. Wilderness Areas	BLM
Surface Mining_Control and Reclamation Act (SMCRA) c	Prime and Unique Farm Lands.	Natural Resource Conservation S (NRCS)
Executive Order 11988 as amended.	Floodplains	All Agencies
Executive Order 11990.	Wetlands/Riparian Zones	All Agencies
Wild and Scenic Rivers Act of 1968 as amended.	Wild and Scenic Rivers	All Agencies
National Historic Preservation Act of 1966 as amended. Antiquities Act of 1906.	Cultural resources	All Agencies
American Indian Religious Freedom Act 1978. Nati ve Ar Graves Protection and Repatriation Act (NAGPRA) 1990.	Native American Religious Concerns	All Agencies
Endangered Species Act (ESA) 1973 as amended. (Sectio	Threatened ru1d Endangered plant and animal	U. S. Fish and Wildlife Service (FWS)
Bald and Golden Eagle Protection Act	Protection of Eagles	
Migratory Bird Treaty Act	Protection to Migratory Birds, Nests and Egg:	U.S. FWS
National and New Mexico BLM Instruction Memoranda	BLM and New Mexico State Sensitive Specie Habitat.	BLM
Resou rce Conservation and Recovery Act (RCRA) of 197	Use of Hazardous Materials	USEPA
Comprehensive Environmental Response, Com pensation Liability Act (CERCLA) 660 as amended.	Use and Disposal of listed Hazardous Materi2	USEPA
Executive Order No.22898, February 1994.	Environmental Justice for environmental and conditions in minority and low-income comm	All Ag_encies
Federal Noxious Weed Act 1974, as amended and Executi Order 13112.	Designated Certain Plants as Noxious Weeds.	All Agencies
New Mexico Noxious Weed List	Noxious weeds for the State of New Mexico.	New Mexico Department of Agri
Mineral Leasing Act (MLA) 1929, as an1endcd. Associat Onshore Orders: National. State and Local.	Issue and managed federal oil and gas leases related transportation pipelines.	BLM

APPENDIXB

Plats

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State of New Mexico
Energy. Miner11ls & Natural Resources Oepar1ment
OIL CONSERVATION DIVISION
1220 South St. Francis Dr.
Santa Fe, NM *87SOS*

Form C-102
Revised October 16, 2010
Submit once copy to appropriate
District OffiCe

O AMENDED REPORT

WELL LOCATION Al\"D ACREAGE DED!CATIOK PLAT

API I'llMbct	1 PoolCOd<	PooiN&mc: MESAVERDE / DAKOTA
4 P'"P'"YCOdt	5 NYESRC	Wcll>;wnt.or 13N
OGRIDI'o.	" OpcnuwW me BURlINGTON RESOURCES OIL & GAS COMPANY LP	Elcvattoo 6051

10 SURFACE LOCATION

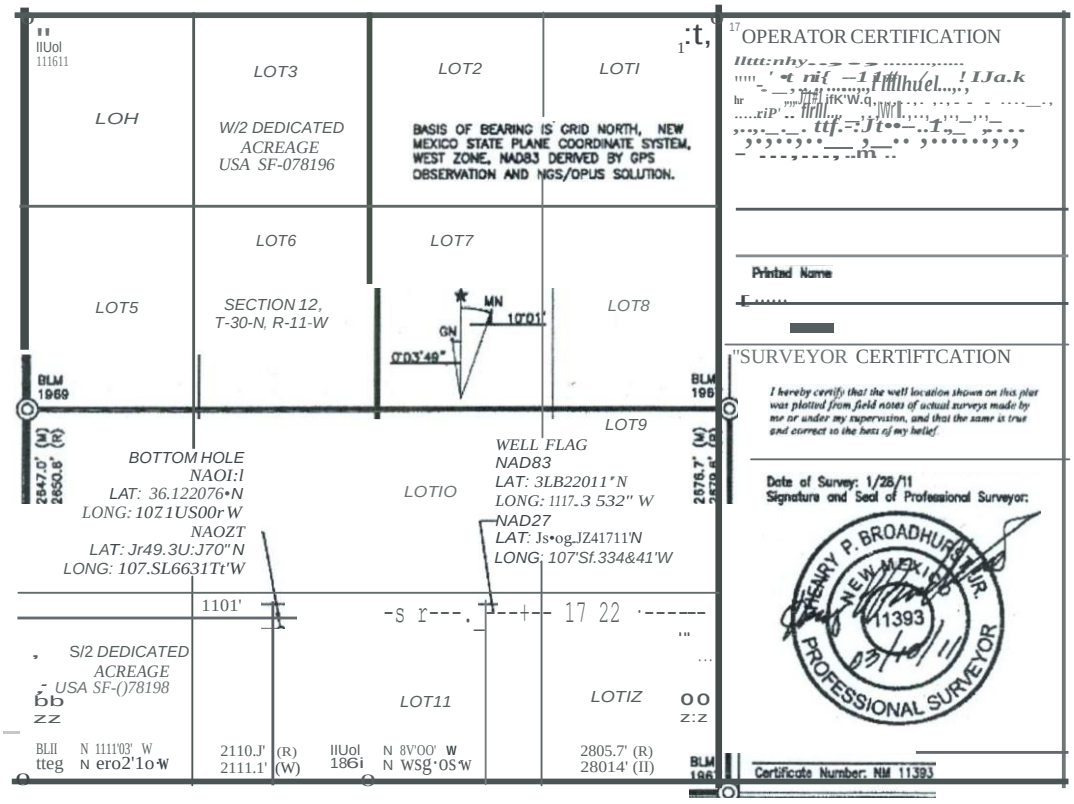
UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	c-ty
O	12	30-N	11-W		1150	SOUTH	1722	EAST	SANJUAN

11 Bottom Hole Location If Different From Surface

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	c-.y
N	12	30-N	11-W		1122	SOUTH	1909	WEST	SANJUAN

12 Dedicated Acres	13 Joint or Infill	14 Consolidation Code	15 Order No.
S/2 - 320.68 - MV W/2 - 320.77 - DK			

NO ALLOWABLE WILL BE ASSIGNED TO THIS COMI'LEIION VN11L ALL INTERESTS HAVE BEEN CONSOUDATED OR ... NON-STANDARD UNIT HAS BEEN APPROVED BY TiIE DMSION



17 OPERATOR CERTIFICATION

Printed Name

"SURVEYOR CERTIFTCATION

I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.

Date of Survey: 1/28/11
Signature and Seal of Professional Surveyor:

HENRY P. BROADHURST
NEW MEXICO
11393
PROFESSIONAL SURVEYOR

Certificate Number: NM 11393

BURLINGTON RESOURCES OIL & GAS COMPANY LP

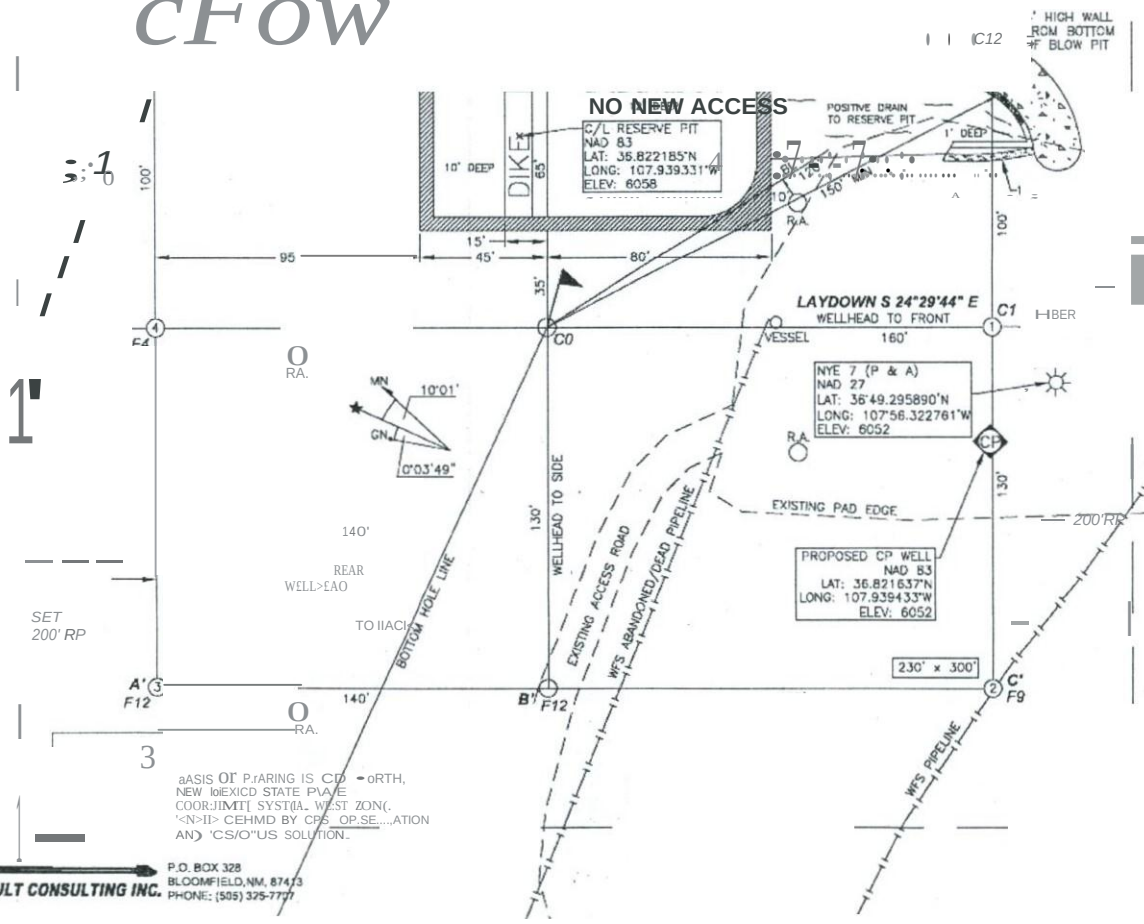
NYE SRC 13N

1150'FSL,1722'FEL

SECTION 12, T-30-N, R-11-W, N.M.P.M.,

SAN JUAN COUNTY, NEW MEXICO

ELEV.: 6051 NAV088 DATE: JANUARY 28, 2011



NYE SRC 13N WELL FLAG
.: 36.822081'N (NAD83)
NG : 107.939532'W (NAD 83)

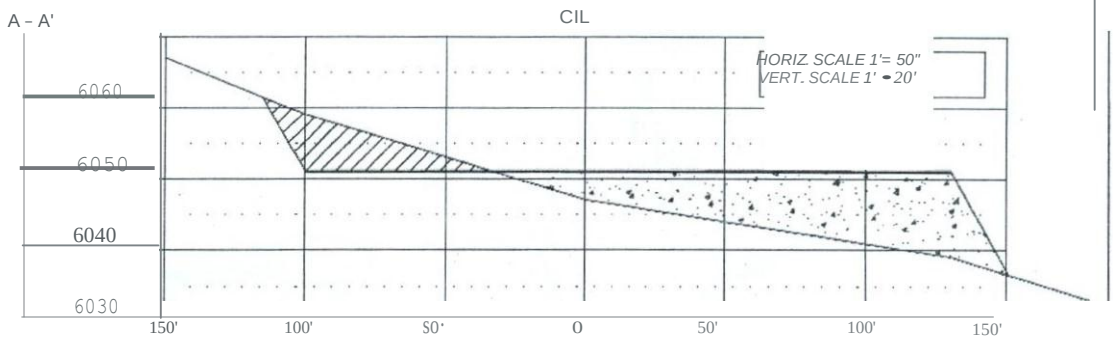
13.Jo' • 400' – J.OJ ACRES!

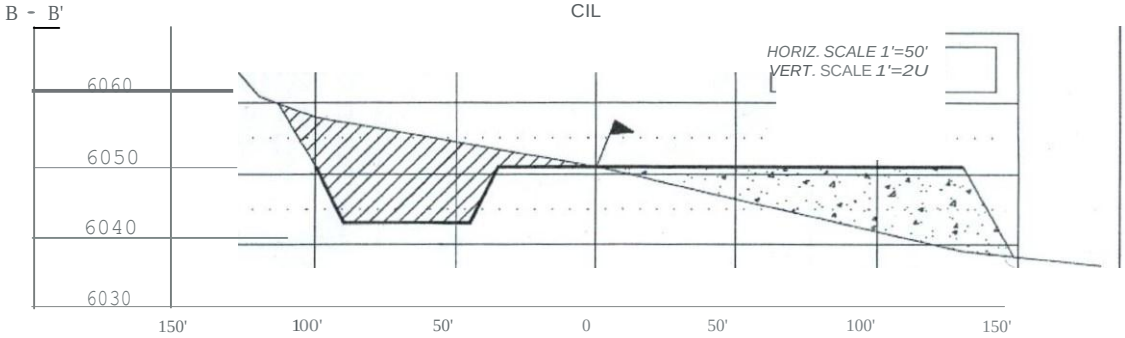
CP/RECT:J

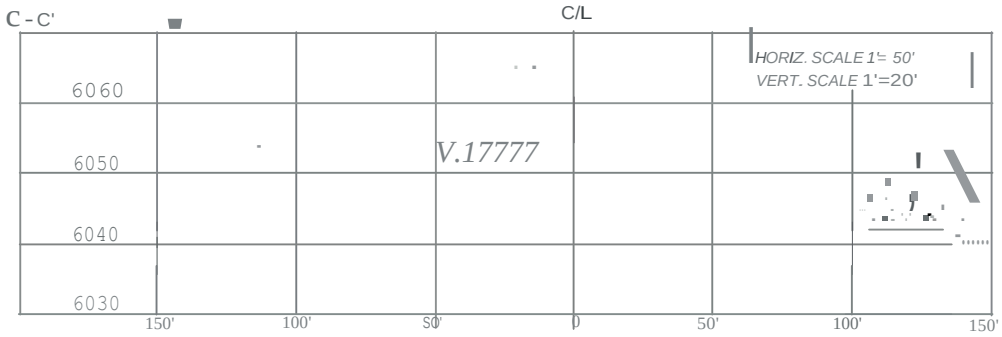
CCI

BURLINGTON RESOURCES OIL & GAS COMPANY LP

NYE SRC 13N
1150' FSL, 1722'FEL
SECTION 12, T-30-N, R-11-W, N.M.P.M.,
SAN JUAN COUNTY, NEW MEXICO
ELEV.:6051 NAVD88







NOTE: CCI IS NOT LIABLE FOR UNDERGROUND UTILITIES OR PIPELINES.

CONTRACTOR SHOULD CALL ONE-CALL FOR LOCATION OF ANY MARKED OR UNMARKED BURIED PIPELINES OR CABLES ON WELL PAD AND OR ACCESS ROAD PRIOR TO CONSTRUCTION.

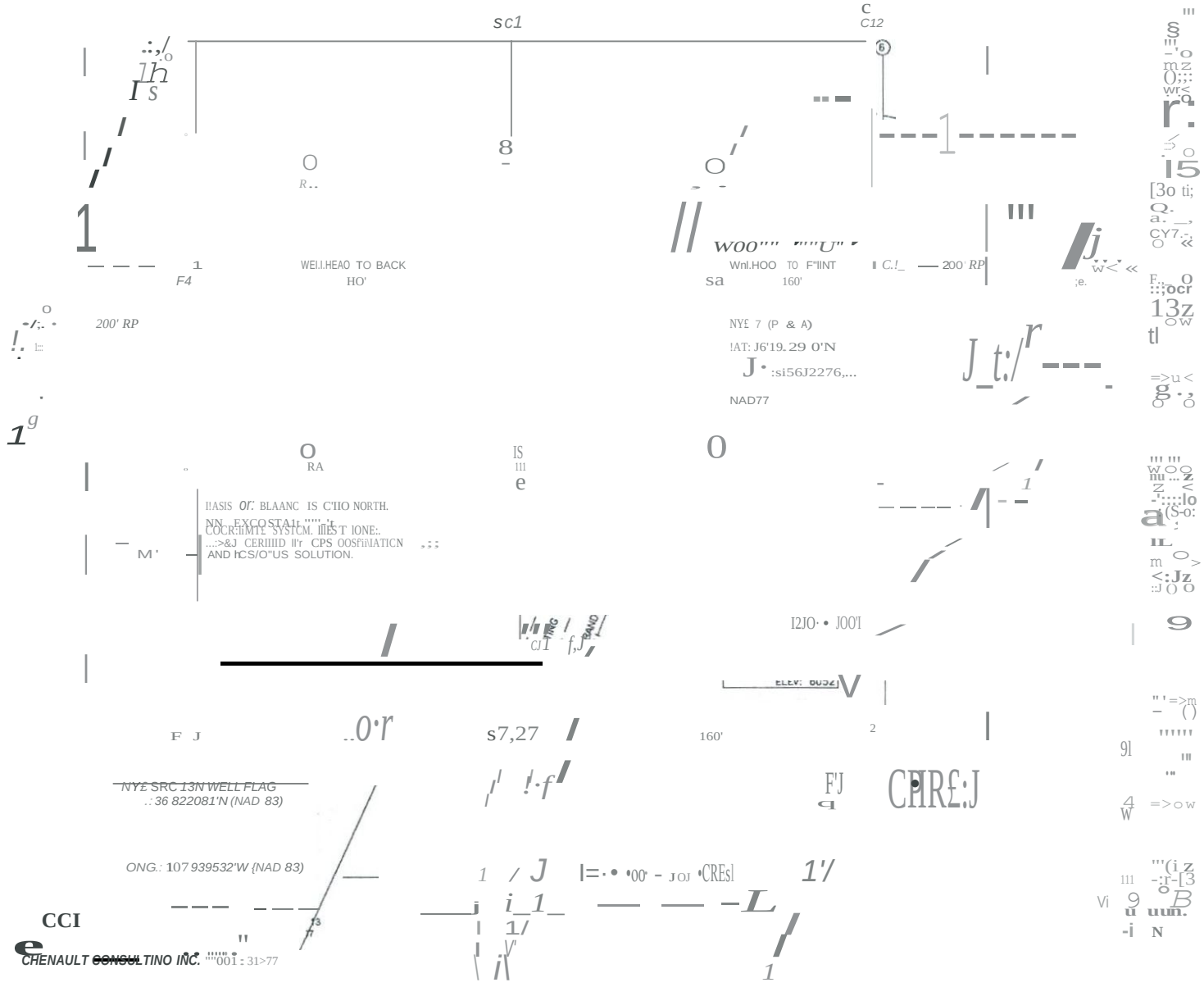
REVISIONS

NO.	DESCRIPTION	REVISED BY	DATE
1	ISSUED FOR REVIEW	TJR	1/26/11
2	BOTTOM HOLE MOVE	TJR	3/04/11

CCI
CHENAULT CONSULTING INC.
P.O. BOX 328
BLOOMFIELD, NM, 87413
PHONE: (505) 325-7707

BURLINGTON RESOURCES OIL & GAS COMPANY LP

NYE SRC 13N
1150' FSL,1722' FEL
SECTION 12, T-30-N, R-11-W, N.M.P.M.,
SAN JUAN COUNTY, NEW ME.XIcc:;--
ELEV.: 6051 NAV088 DATE: JANUARY 28, 2011
NO NEW ACCESS



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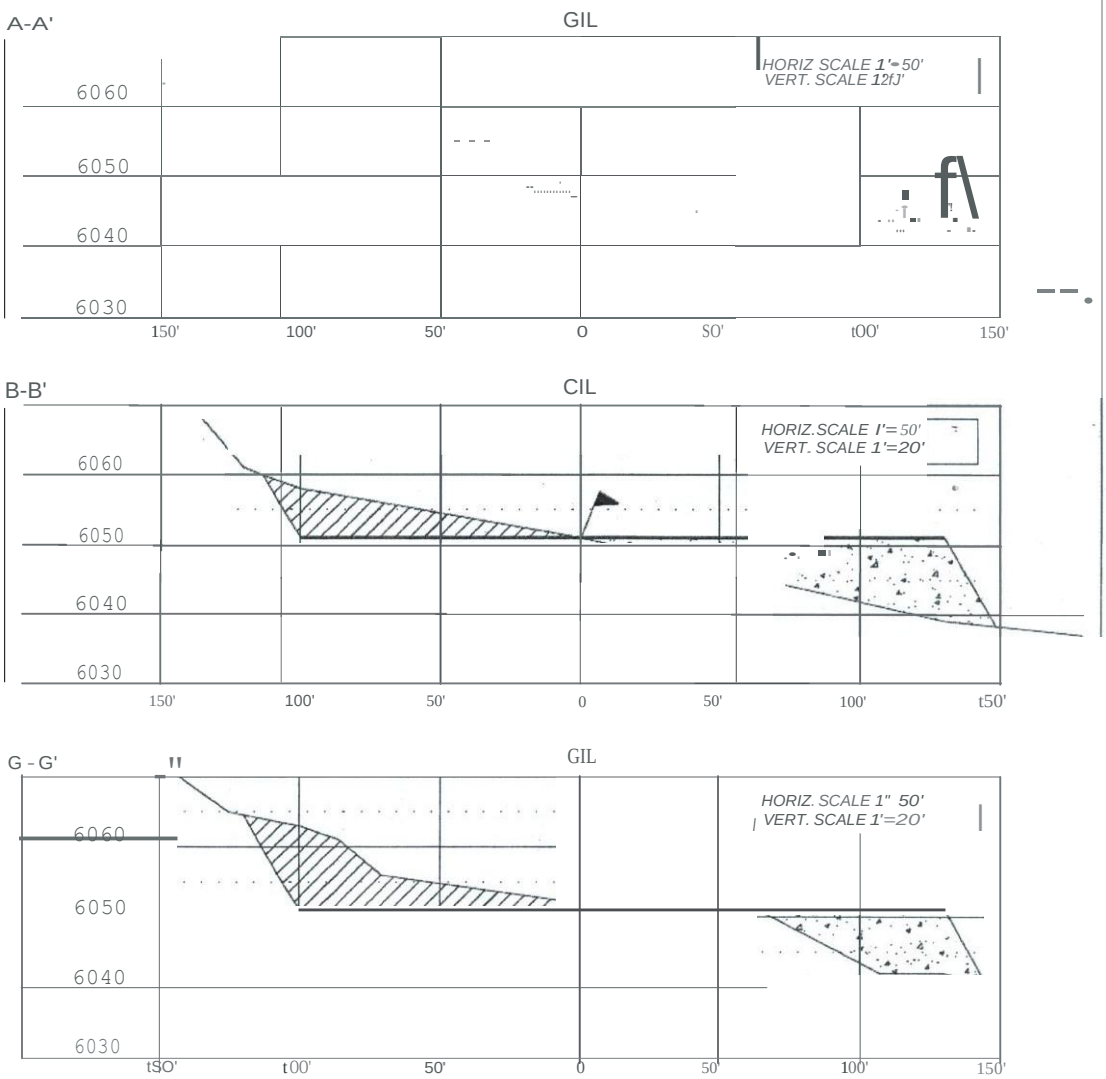
BURLINGTON RESOURCES OIL & GAS COMPANY LP

NYE SRC 13N
1150'FSL, 1722'FEL
SECTION 12, T-30-N, R-11-W, N.M.P.M.,
SAN JUAN COUNTY, NEW MEXICO
ELEV.: 6051 NAVD88



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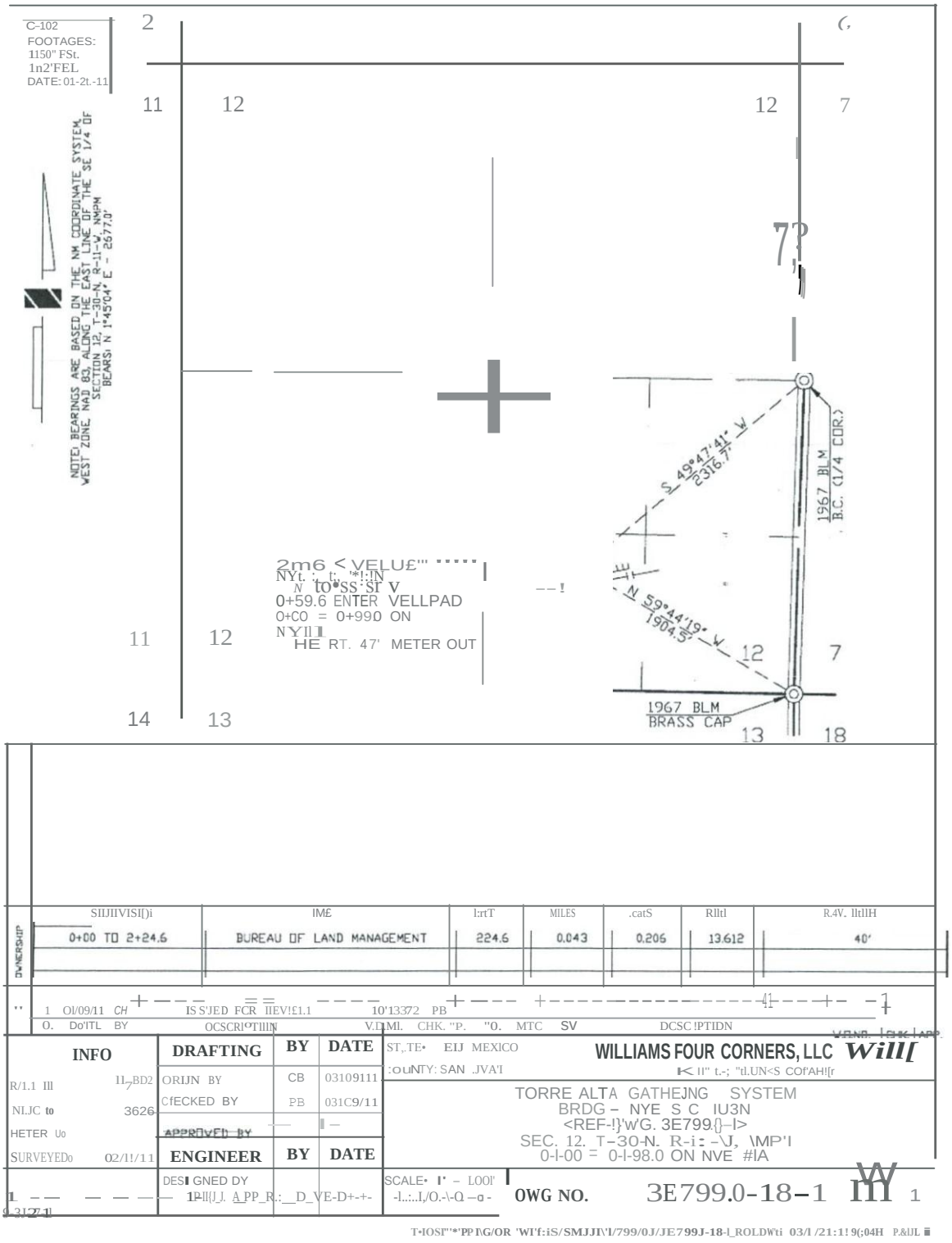
CCI

CHENAULT CONSULTING INC.


C-102
FOOTAGES:
1150" FSt.
1n2'FEL
DATE: 01-2t.-11
NOTED BEARINGS ARE BASED ON THE NM COORDINATE SYSTEM, WEST ZONE, NAD 83, ALONG THE EAST LINE OF THE SE 1/4 OF SECTION 12, T-30-N, R-11-W, NMPM
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APPENDIXC

BLM-FFO Noise NTL (04-02 FFO)

Notice to lessees and Operators on Onshore Oil and Gas leases Within the Jurisdiction of the Farmington Field Office (FFO) (NTL04-2 FFO)

Management of Sound Generated By Oil and Gas Production and Transportation

I. Introduction – Increases in the level of sound (noise) generated from the production and pipeline transportation of oil and gas has occurred in the San Juan Basin over the last four years. These increases are generated primarily from the escalating need to use equipment such as compressors and pumping units, which operate on a continual basis. The increase in noise affects natural resource values and management of a number of agency designated special areas [special management areas (SMAs), areas of critical environmental concern (ACECs), research natural areas (RNAs}, etc.]. Noise sensitive areas (NSAs) were determined as visitor use areas, wilderness, semi-primitive recreation areas, habitat for threatened or endangered specis, raptor nesting/roosting sites, recreational trails and sites where people live and work.

II. Purpose – The Bureau of Land Management (BLM) recognizes solitude (lack of or limited sound) as a part of the natural environment that requires protection and reduction of noise in some instances. The following requirements are for reducing noise levels on federal and Indian oil and gas leases under the jurisdiction of the Farmington Field Office (FFO). The BLM will use adaptive management principles to monitor and adjust implementation of this NTL as additional data becomes available.

III. Noise Sensitive Areas – All or a portion of approximately 61 specially designated areas (SDAs) established through the BLM land use planning process are being identified as noise sensitive areas (NSAs).

IV. Noise Standards – Noise will be measured on the "A" scale, using the attached protocol. The sound level (A scale) must be less than or equal to 48.6 dB(A) over a continuous 24-hour period (i.e., 48.6 dB[A]Leq). This requirement applies to oil and gas lease operations that operate on a continual (>8 hours/day), long-term basis (>1 week in duration). The NTL will not apply to transient operations such as construction, drilling, completion-or-workover activities or temporary non""il and gas sound sources. These activities will be handled on a case-by-case basis should a conflict be identified during the permitting process. The NTL does not apply to short-term events such as venting a well, compressor start-ups, etc.

V. Application of Standards within NSAs – Noise control will be receptor- or boundary-focused, as determined by agency management guidelines established for the designated

SMAs, ACECs, or other designations. Receptor-focused control will apply to 45 BLM and 4 USFS NSAs. Receptor-focused areas may include campgrounds, picnic areas, shorelines, etc. Boundary-focused control will include all designated acreage within 7 BLM (refer to the tables table listed below), 3 USFS, and 1 NPS NSAs, in addition to all USSR land around Navajo Reservoir.

Receptor-Focused NSAs

- Noise standards of 48.6 dB(A) Leq will be achieved at established agency receptor points within the NSAs. Established receptors are generally defined as visitor use areas, camp or picnic areas, habitat for threatened or endangered species, archaeological sites, and recreation trails. Receptors may vary in size from a single point source to several acres based on the features and resource components that are being managed for sound. The agency will work with the operator to establish the applicable receptor points. Buffers of 0 to 100 feet from the defined receptor may be established. The SDAs within which receptors will be designated are as follows (***notes areas where stricter standards may apply):

BLM Receptor-Focused NSAs

1. ***Andrews Ranch	16. Hayne Trading Post	31. Tapacito and Split Rock
2. ***Bee Burrow	17. Holmes Group	32. ***Toh-la-kai
3. ***Bis sa'ani	18. ***Ind,ian Creek	33. ***Twin Angels
4. BiYaazh	19. ***Jacques Chacoan Community	34. ***Upper Kin Klizhen
5. Blanco Star Panel	20. ***Kin Nizhoni	35. Alien Run
6. ***Casamero Community	21. Margarita Martinez Homestead	36. ***Angel Peak Scenic Area
7. Christmas Tree Ruin	22. Martin Apodaca Homestead	37. Glade Run
8. Church Rock Outlier	23. ***Morris 41	38. ***Navajo Lake Horse Trail
9. ***Crow Canyon	24. Moss Trail	39. Negro Canyon
10. Delgadito-Pueblo Canyons	25. North Road (Segments 1,2, ***6, 7)	40. Pinon Mesa
11. Dogie Canyon Schools	26. ***Pierre's Site	41. ***Simon Canyon
12. Encinada Mesa-Carrizo Canyo (Gomez Point, Gomez Canyon Hill Road Ruin)	27. Rockhouse-Nestor Martin Homestead	42. ***Bald Eagle
13. Frances Mesa (Frances Ruin)	28. San Rafael Canyon	43. Reese Canyon
14. Gonzalez Canyon-Senon S. Vigil Homestead	29. Simon Ruin	44. River Tracts
15. Halfway House	30. Superior Mesa	45. Mexican Spotted Owl

USFS Receptor-Focused NSAs

1. ***Buzzard Park Campground	3. ***Gasbuggy
2. *--cectar Springs Campground	4. -Carracas Mesa Administrative Site

Boundary-Focused NSAs

- For noise sources located inside NSAs, the standard is 48.6 dB(A) Leq at 400 feet in all directions from the noise source. For noise sources located outside of designated NSAs, the standard of 48.6 dB(A) Leq must be met at the boundaries of

the NSAs. Noise sources located within 400 feet of the NSA boundary will generally be allowed to meet the standard 400 feet from the source. The SDAs that will be boundary-focused NSAs are as follows (***notes areas where stricter standards may apply):

BLM Boundary-Focused NSAs

1. ***Cho'li'i (Gobernador Knob)
2. Dzil'na'oodlii (Huerfano Mesa)
3. Fossil Forest RNA
4. Carracas Mesa
5. Thomas Canyon (original acreage)
6. ***Ah-shi-sle-pah WSA
7. ***Bistij De-Na-Zin Wilderness

USFS Boundary-Focused NSAs

1. Middle Mesa Raptor Area (prior approval required)
2. Ulibarri Raptor Area (prior approval required)
3. Munoz Canyon Raptor Area (prior approval required)

NPS Boundary-Focused NSA

1. ***Aztec Ruins National Monument

USBR Boundary-Focused NSA

1. All USBR land around Navajo Reservoir

Occupied Dwellings, Residences, and Buildings

- For noise sources involving federal or Indian leases located near occupied dwellings or buildings, the standard of 48.6 dB(A) Leq will be met 100 feet from such structure. Policy will not apply to unoccupied lands but can be enforced when those lands are developed. When oil and gas operations pre-date occupancy, the new resident will be asked to contribute to noise mitigation. For noise sources located within incorporated city or township limits, the standards of that municipal jurisdiction will normally be applied. However, if there isn't a municipal standard, BLM will enforce this NTL for noise sources associated with federal minerals.

Stricter Standards

- Stricter standards may be applied to NSAs identified by a triple asterisk in the tables listed above. In these instances, BLM may need the flexibility to adjust the general noise standard. BLM, USFS, USBR and NPS staffs will work with the operator on a case-by-case basis to achieve an acceptable level of noise mitigation. Factors considered in this process would be: (1) the particular aspects of the area (i.e., landseape, topography, etc.),-(-2) resource values and uses, (3) public values and uses and (4) the extent the 48.6 dB(A) Leq impairs values and uses.

NewNSAs

- In addition to the 61. areas listed in the tables, new SMAs, camping, picnic or trail areas may be identified and/or developed by land management agencies. This

policy would be implemented, in and/or near these areas after a 30-day notice to the affected parties, using section VI schedules.

VI. Implementation of NTL – Upon implementation of the NTL, affected operators in or adjacent to NSAs will be provided general ownership maps depicting the NSAs. Detailed descriptions of the NSAs will be maintained and available at local administering agency offices.

With the exception of the NSAs identified by a triple asterisk in the tables, newly installed noise sources that affect NSAs (inside or adjacent to exterior boundaries) must meet the noise standard 60 days from the date the source is set in the field. All major renovation and/or replaced noise sources must meet the standard 60 days from the date the equipment is renovated and/or replaced. A condition of approval will be included with approved Applications for Permit to Drill (APDs) requiring the operator to meet the noise standard for spurces at new well locations that are permitted within or adjacent to an NSA. These standards apply to rights-of-way grants.

For existing sources of noise within defined NSAs, within 90 days of approval of the NTL, the operator shall inventory these locations and submit them to the BLM along with a proposed plan for meeting the NTL standard. The compliance plan submitted by the operator must demonstrate compliance of all applicable noise sources within 5 years, incorporating the agency time-frame compliance priority goals. All major renovation and/or replaced noise sources must meet the standard 60 days from the date the equipment is renovated and/or replaced.

VII. Procedures – A subsequent report (SR) Sundry (Form 31.60.5) must be submitted to the BLM for approval by the authorized officer (AO) within 5 days of setting the equipment, which exceeds the noise standard and must be mitigated. A notification Sundry is not required for existing and new noise sources that do not exceed the 48.6 dB(A) Leq standard. A copy of the SR should be sent to the appropriate surface managing agency. Prior approval is required before setting a noise source that could affect the threatened or endangered species and raptor NSAs. The notice must include: (1.) the location of the proposed noise source [township, range, section, footage or quarter/quarter (i.e., NE/4SE/4)], (2) name of the well location or facility type, (3) type of noise source (i.e., compressor, pumping unit, etc.), (4) serious safety considerations, and (5) any other information required by the AO.

- For existing and new noise sources, the surface managing agency will initially work with the applicant to establish the applicable receptor points to which the NTL standard will apply. In addition, tbe BLM wiJl.wQrk witb ap Jiicants and use ilexibility for mitigation of sound with boundary-focused areas.

- For new noise sources, once a receptor is permanently defined and noted on NSA maps provided by BLM to the operator, the operator must comply with the 48.6 dB(A) Leq standard and provide the BLM with noise level measurements (if needed) within the 60-day period.

For existing noise sources, once a receptor is permanently defined and noted on NSA maps provided by BLM to the operator, the operator must comply with the noise standard according to the schedule of the 5-year plan for existing noise sources. If a new receptor has been defined in an area that has passed the schedule of the 5-year plan, the operator must comply with the noise standard and provide the BLM with noise level measurements (if needed) within 60 days of receiving a 30-day notice for newly defined receptor.

- The standard defined in Section IV or determined during the approval process must be met after the 60-day period. Measurements must be taken following the established protocol at points designated by BLM or other land management agencies.

VIII. Variances- Variances may be granted on a case-by-case basis by the AO. To obtain a variance, a Notice of Intent Sundry (NOI-Form 3160.5) or a letter must be submitted to BLM for approval. Copies of the Sundry or letter should be sent to any appropriate surface managing agency. The sundry or letter must include the same information as an NOI.

IX. Compliance - Failure to comply with the above policy and conditions of approval may result in an assessment for noncompliance being issued pursuant to 43 Code of Federal Regulations (CFR) 3163.1by BLM staff. Any and all instructions, orders, or decisions issued are subject to administrative review pursuant to 43 CFR 3165.3 and appeal pursuant to 43 CFR 3164 and 43 CFR 4.700.

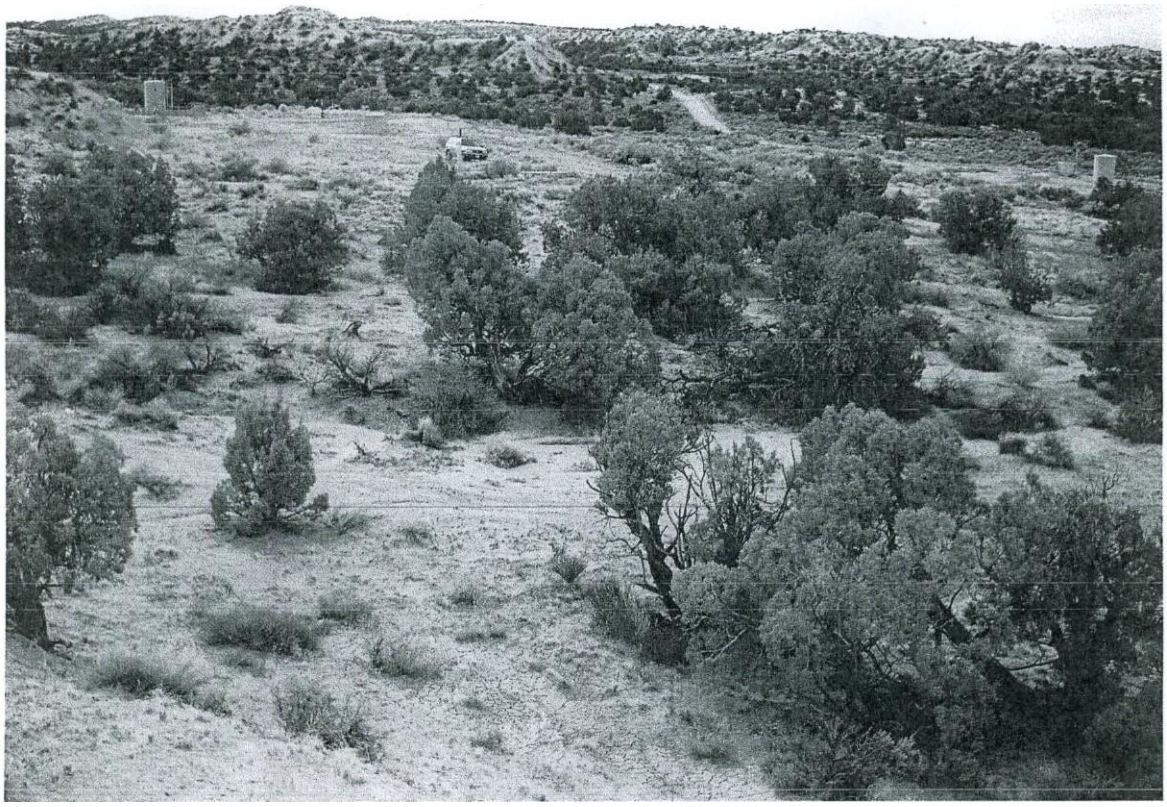
This NTL will be reviewed annually and may be modified based on monitoring and current results of implementation, a changing environment, and evolving technologies.

APPROVED: Date _____ _____

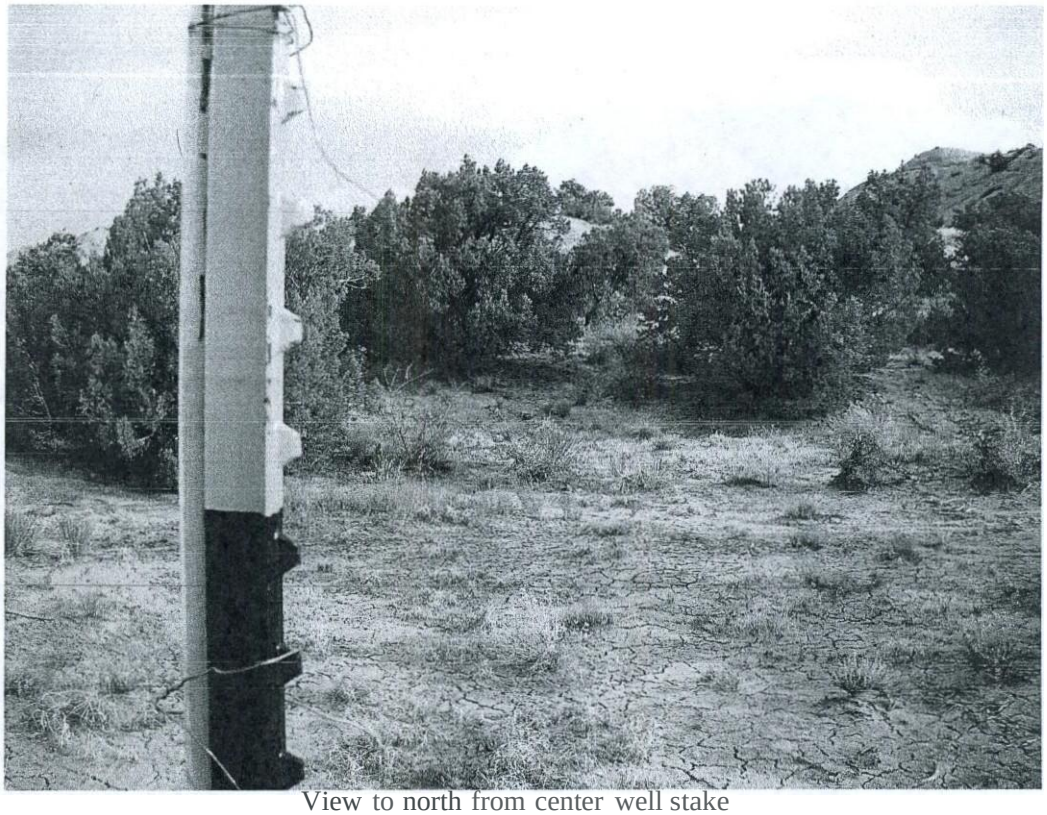
Farmington Field Manager

APPENDIXD

Photographs



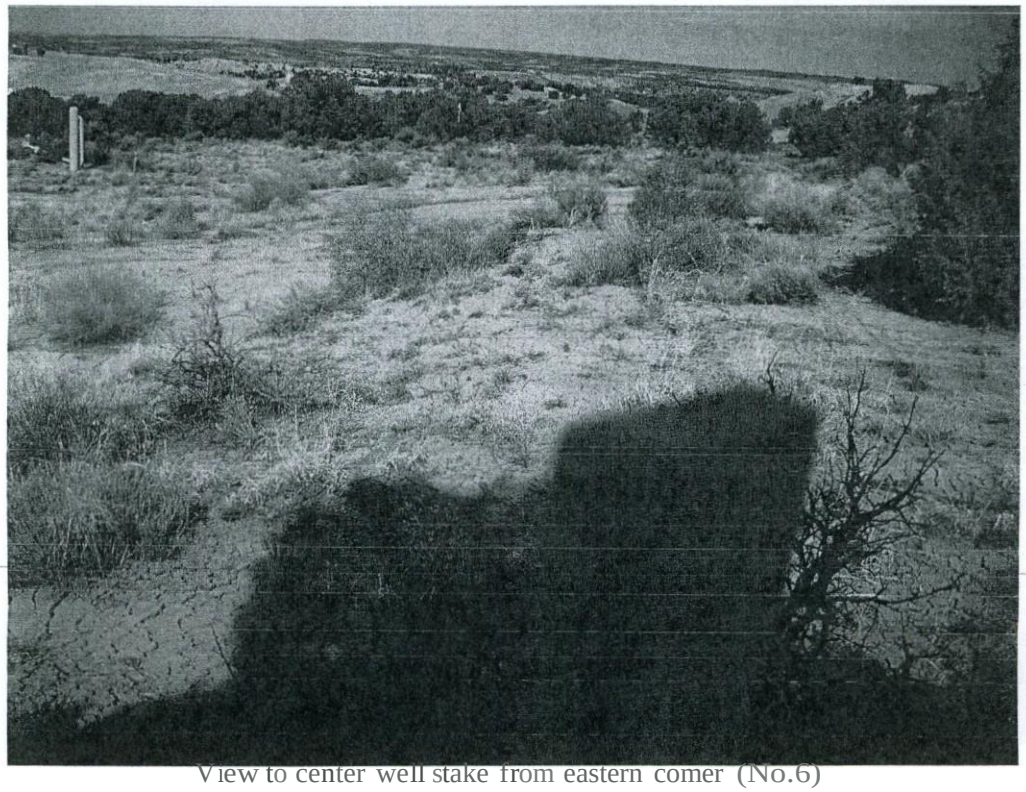
Overview of entire proposed well pad area, looking southward from badland hills north of proposed well pad



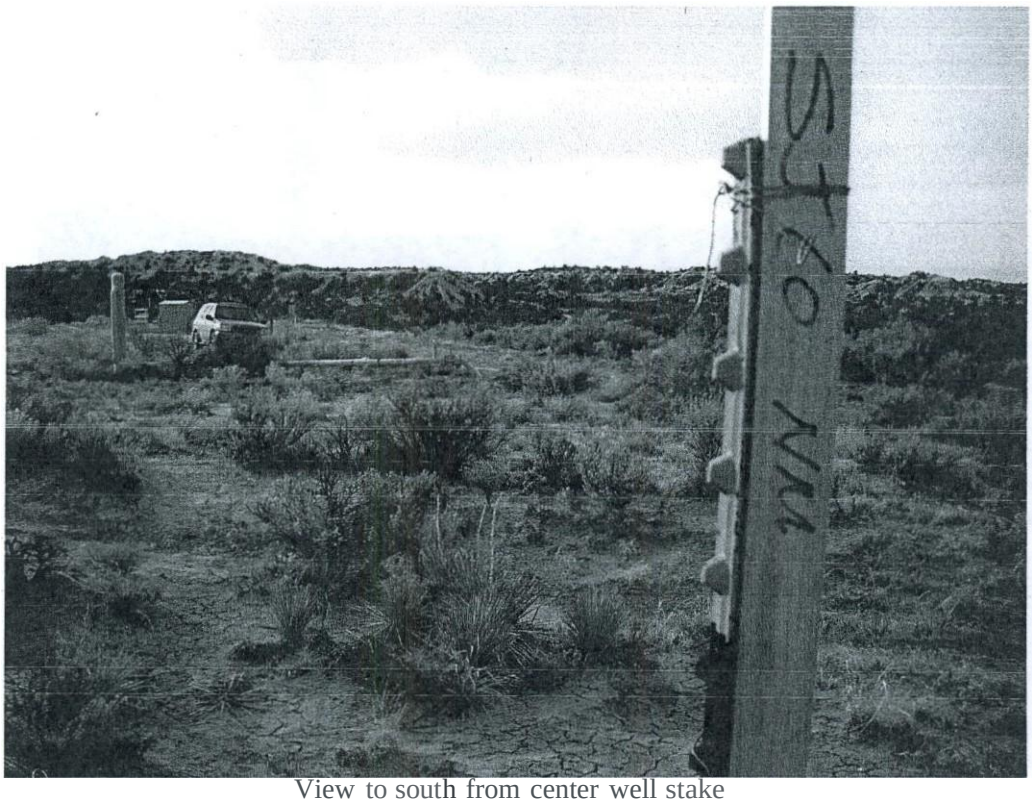
View to north from center well stake

View to center well stake from northern comer (No.5)

View to east from center well stake

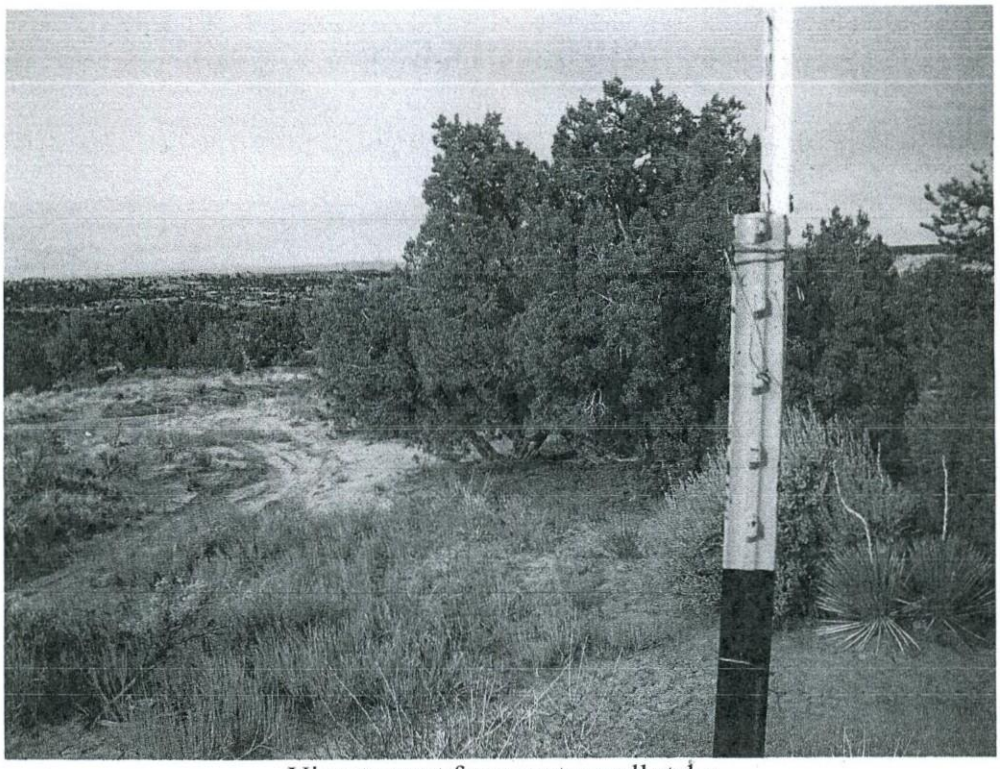


View to center well stake from eastern comer (No.6)



View to south from center well stake

View to center well stake from southern corner (No.2)



View to west from center well stake

View to center well stake from western comer (No.3)

APPENDIXE

Biological Survey Report

BIOLOGICAL SURVEY REPORT

For the Proposed:

Nye SRC No.13N
Well Pad and Pipeline Tie

Sponsored by:

Burlington Resources Oil and Gas Company, LP
&
Williams Four Corners, LLC
Farmington, New Mexico

Prepared By:

Nelson Consulting, Inc
Farmington, New Mexico

SAN JUAN COUNTY, NEW MEXICO

April2011

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BURLINGTON RESOURCES OIL AND GAS COMPANY, LP & WILLIAMS FOUR CORNERS, LLC's PROPOSED NYE SRC No. 13N WELL PAD AND PIPELINE TIE

This report describes the potential for Federal 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 proposed 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's biological survey guidelines (Kendall 20 l0) and is intended to provide the agency with information to make determinations of effect on species with special conservation status.

PROJECT DESCRIPTION

The proposed action is the construction, drilling, production, operation, abandonment, and reclamation of a gas well and an associated well pad and pipeline tie. The well, the Nye SRC No. l3N, and associated well pad and access road are proposed by Burlington Resources Oil and Gas Company, LP (Burlington). The pipeline tie is proposed by Williams Four Corners, LLC (WFC). The purpose of the action is to provide energy resources, enhance natural gas production in the surrounding area, and generate revenue for Burlington and the federal government.

Location

The proposed Nye SRC No. 13N has minerals administered by the BLM, Farmington Field Office (BLM-FFO). The proposed action area is on BLM-FFO surface. The proposed action area is located in the San Juan Basin of northwestern New Mexico, approximately 2.2 miles east of the town of -Aztec and 500 feet north of New Mexico State Highway 173 (see Appendix B, Figure 1). More specifically, the proposed action area would be located within the:

Wlh of the SElf.of Section 12,
Township 30 North, Range 11 West,
New Mexico Principal Meridian,
San Juan County New Mexico

An action area map showing the location of the proposed action area on the Aztec, New Mexico, 7.5-minute U.S. Geological Survey Quadrangle is provided as Figure 2 in Appendix B. The proposed well pad would partially overlap the plugged and abandoned (P&A) Nye No.7 well pad and an existing access road. It would be immediately northwest of the existing Nye No. lA well pad, and approximately 50 feet northeast of the northeastern side of the existing Nye SRC No. l0 well pad. Kart Kanyon Speedway, an outdoor dirt-racing track, is located approximately 600 feet west of the proposed well pad. Informal dirt bike tracks, shotgun shells, and trash are found within and surrounding the proposed action area. An aerial photo of the proposed action area is provided as Figure 3 in Appendix B.

Vehicle access to the proposed action area is via New Mexico State Highway 173, then north on an existing access road. The proposed wellhead is located at the following coordinates:

NAD83 36.822081oN
107.939532° W

BLM Areas of Critical Environmental Concern (ACECs) and Specially Designated Areas (SDAs)

The proposed action area is not located within any ACECs or SDAs.

Disturbance

The maximum pennitted disturbance associated with the proposed action would be approximately 3.24 acres. Actual new disturbance would be approximately 2.75 acres. See Appendix D for plats associated with the proposed action.

PROPOSED DISTURBANCE ACREAGE

Project Component	Previous/ Existing Disturbance Acreage	New Disturbance Acreage	Total
Well Pad	0.29	2.74	3.03
Pi eline Tie	0.20	0.01	0.21
TOTALS	**0.49**	2.75	3.24

Well Pad

The proposed well pad would measure 230 feet by 300 feet. A 50-foot-wide construction zone would surround the proposed well pad. Thus, maximum disturbance associated with the well pad would be 3.03 acres.

The proposed well pad overlaps 0.21 acre of the Nye No.7 P&A well pad, which has not yet been successfully reclaimed. In addition, approximately 117 feet (0.08 acre) of an existing, active access road travels through the proposed well pad. Therefore, *new* disturbance associated with the well pad would be approximately 2.74 acres.

The maximum cut would be 12 feet on the eastern corner (No. 6) of the proposed pad. The maximum fill would be 12 feet on the western corner (No.3) and southwestern side (B').

Pipeline Tie

Once the proposed well is compl eted, a 224.6-foot-long, 40.0-foot-wide pipeline tie route would connect the proposed well to the existing Nye No. 1A pipeline. The maximum disturbance resulting from the pipeline tie would be approximately 0.16 acre. However, 215.0 feet of the proposed pipeline tie would overlap the proposed well pad and construction zone. The remaining 9.6 feet of the pipeline tie would result in new disturbance of 0.01 acre.

METHODOLOGY

Off-Site Methods

Prior to conducting fieldwork, Nelson Consulting, lnc. (NCD obtained physical and biological infonnation about the proposed action area.

DATA SOURCES

Resource	Data Source
Soil	U.S. Department of Agriculture, Natural Resources Conservation Service(NKCS) Web Soil Survey (httR:I/websoilsurve:y.nrcs.usda.gov/am/WebSoiiSurve:y.asRX & Soil Survey of San Juan Cou ntv, New Mexico, Eastern Part
Geology	U.S. Geological Survey New Mexico Geologic Map Data (htto://tin.er.us!!s.eov/!!eolo!!v/state/state.oho?state=NM)
SDAs & ACECs, Raptor Nests, & Plant SMS Potential Habitat "Zone" Locations	BLM-FFO Shapefiles

Resource	Data Source
Federally Listed Threatened & Endangered Species	U.S. Fish and Wildlife Service Southwest Region (http://www.fws.oov/southwest/es/NewMexico SBC intro.cfm)
BLM-FFO SMS	BLM-FFO Threatened and Endangered Species Biologist

Survey Methods

A biological survey of the proposed Nye SRC No. 13N well pad and construction zone was conducted by NCI biologist Jenny Bell on March 15, 2011. Habitat within and surrounding the proposed action area was evaluated for the potential for listed species to occur. In areas with appropriate habitat for listed flora species, thorough ground surveys were conducted. These surveys consisted often-foot-wide pedestrian surveys. Surrounding areas were visually inspected with binoculars for nests, raptors, or past signs of raptor use. Digital photos were taken of the proposed action area (Appendix B), and all plant and wildlife species observed in the proposed action area were recorded (Appendix C).

RESULTS

Physical Description of Area

Topography, Terrain, & Geology

The general area consists of rolling hills and ephemeral washes. Badlands are present on the northern and northeastern sides of the well pad. Terrain within the proposed well pad ranges from flat to hilly. Elevation at the proposed well pad is approximately 6051 feet. The proposed well pad would partially overlap the plugged and abandoned (P&A) Nye No. 7 well pad and an existing access road. Surface geology of the proposed action area is the Nacimiento Formation, which consists of a sequence of varicolored beds of sandstone and mudstone as thick as 1500 feet.

Soils

The San Juan Basin is bordered by the Defiance Uplift and Chuska Mountains to the west, San Juan Dome to the north, Chaco Slope and Zuni Uplift to the south, and Nacimiento Uplift to the east. In total, the San Juan Basin covers a surface of approximately 4600 square miles. The soils in the San Juan Basin were formed primarily from two kinds of parent material: alluvial sediment and sedimentary rock. The alluvial sediment is material that was deposited in river valleys and on mesas, plateaus, and ancient river terraces. The material has been mixed and sorted in transport and has a wide range of mineralogy and particle size. Sedimentary parent material consists mainly of sandstone and shale bedrock. These shale and resistant sandstone beds form prominent structural benches, buttes, and mesas bounded by cliffs.

The Soil Conservation Service (now the Natural Resource Conservation Service [NRCS]) has surveyed the soils in the proposed action area. Complete soil information is available in the Soil Survey of San Juan County, New Mexico, Eastern Part, developed by the United States Department of Agriculture, NRCS.

Soils of the proposed action area are mapped as the Gypsiorthids-Badlands-Stumble complex, moderately steep. This unit is found on hills, knolls, and breaks and in valleys; slope is 5 to 30 percent. The unit is comprised of 35 percent Gypsiorthids, 5 to 30 percent slopes; 35 percent Badlands, 5 to 30 percent slopes; and 15 percent Stumble loamy sand, 5 to 8 percent slopes. The remaining 15 percent of this unit is comprised of small areas of Farb and Persayo soils on hills and breaks.

The Gypsiorthids portions of this soil unit have variable attributes and may be very shallow to deep. Available water capacity is very low to high, runoff is slow to medium, and water erosion potential is slight to moderate. This soil is generally well drained, and formed in material derived dominantly from gypsum. Badland consists of nonstony, barren, shale uplands that are dissected by deep, intermittent drainageways and gullies. The Stumble soil is deep and somewhat excessively drained. It formed in alluvium derived dominantly from sandstone and shale. Typically, the surface layer is yellowish-brown and pale brown, loamy sand. Permeability is rapid, available water capacity is low, runoff is very slow, and the hazard of water erosion is slight. The potential plant communities in this soil unit include Indian ricegrass, giant dropseed, alkali sacaton, and bottlebrush squirreltail.

Biological Description of Area

Conditions

Weather conditions during the biological survey were cool (41° F), calm, and cloudy.

Habitat & Vegetation

The proposed action area is located on the periphery of open pinon-juniper woodland and sagebrush shrubland habitats. The southeastern portion of the proposed action area consists of sagebrush *(Artemisia tridentata)* and desert scrub species with scattered pifion pine *(Pinus edulis)* and juniper *(Juniperus* sp.) trees. A P&A well pad overlaps this portion of the well pad; this P&A pad has become partially revegetated with desert scrub species and sagebrush. Russian thistle is common on and around the P&A pad and active access road. The northwestern portion of the proposed action area consists of open pinon-juniper woodland. Dominant understory species include broom snakeweed *((Gutierrezia sarothrae)*, Indian ricegrass *((Achnatherum hymenoides)*, and narrowleaf yucca *(Yucca angustissima)*. There are approximately 100 trees within the proposed action area. Ground cover within the proposed action area ranges from 20 to 60 percent. A list of recorded flora species is provided in Appendix C.

Terrestrial Wildlife

Mule deer scat and tracks, large mammal bones, canine tracks, rabbit scat, and small to large mammal burrows were observed during the biological survey. No prairie dog colonies are recorded within the vicinity of the proposed action area.

Migratory Birds

A bluebird *(Sialia* sp.) was observed within the proposed action area during the biological survey. No nests were observed.

Raptor Nesting

According to the BLM-FFO's latest geographic information system (GIS) raptor nest data, no raptor nests are located within one-third-mile of the proposed action area. No cliff ledges are located within the vicinity. The following table indicates the distance from the-proposed actionar-eat0-the-nearest..recorded raptor-nests__ _____

RAPTOR NESTING NEAR PROPOSED ACTION AREA

Species	Distance & Direction from Proposed Action Area
American peregrine falcon *(Falco peregrinus anatum)*	11 mi to ESE
Ferruginous hawk *(Buteo regalis)*	18 mi to S
Golden eagle *(Aquila chrysaetos)*	3 mi to SE
Prairie falcon *(Falco mexicanus)*	6 mi to ESE

Livestock
No sign of livestock or livestock improvements were observed within the proposed action area.

Noxious Weeds
No Federally listed noxious or invasive weed species were observed within the proposed action area. Cheatgrass *(Bromus tectorum)*, a New Mexico-listed Class C noxious weed, was found. Class C species are widespread in the state. Management decisions for these species are determined at the local level, based upon feasibility of control and level of infestation. Russian thistle is also found within the proposed action area, particularly in areas of previous disturbance; though not federally or state-listed, this species is known to outcompete native species throughout the Four Comers.

Federally Listed Threatened and Endangered Species
The United States Fish and Wildlife Service (USFWS) lists II Threatened, Endangered, Candidate, or Proposed species with potential to occur in San Juan County New Mexico. The table below lists these species with their conservation status, habitat requirements, and potential to occur in the proposed action area.

FEDERALLY LISTED (USFWS) THREATENED, ENDANGERED, CANDIDATE, & PROPOSED SPECIES WITH POTENTIAL TO OCCUR IN SAN JUAN COUNTY, NEW MEXICO

Species	Federal Status	Habitat	Potential to Occur in Proposed Action Area (PAA)
PLANTS			
Knowlton cactus *(Pediocactus knowtonii)*	Endangered	Rolling, gravelly hills in piflon-juniper-sagebrush communities. Elevation – 5900-6560 ft.	UNLIKELY: No rolling, gravelly hills within PAA.
Mancos mil kvetch *(Astragalus humillimus)*	Endangered	Large, nearly flat sheets of Point Lookout sandstone. Clusters around margins of bowl-like depressions in bedrock, or cracks / fissures in the sandstone or at the base of gentle, slickrock inclines. Elevation – 5000-6000 ft.	UNLIKELY: Point Lookout sandstone not identified within the PAA.
Mesa Verde cactus *(Sc/erocactus mesae-verdae)*	Threatened	Dry, low, exposed hills and mesas in full sun. Mancos or Fruitland clays. Soils typically high in selenite. Elevation – 3900-6600 ft.	UNLIKELY: Mancos and Fruitland soils not identified within PAA.
FISH			
Colorado pikerninnow- *(Ptychocheilus lucius)*	Endangered with Critical Habitat	Medium to large rivers. Shoreline habitat with sand substrate. Young prefer small, quiet backwaters; adults use various habitats (deep, turbid, strongly flowing water; eddies; runs; flooded bottoms; backwaters; lowlands inundated during spring flow).	WOULD NOT OCCUR: No perennial water resources within immediate vicinity of PAA.
Razorback sucker *(Xyrauchen texanus)*	Endangered with Critical Habitat	Slow areas, backwaters, and eddies of medium to large rivers and their impoundments (preferably reservoirs).	WOULD NOT OCCUR: No perennial water resources within immediate vicinity of

Species	Federal Status	Habitat	Potential to Occur in Proposed Action Area (PAA)
			PAA.
Roundtail chub *(Gila robusta)*	Candidate	Historically occurred in the San Juan, Zuni, San Francisco, and Gila River drainages.	WOULD NOT OCCUR: No perennial water resources within immediate vicinity of PAA.
BIRDS			
Mexican spotted owl *(Strix occidentalis lucida)*	Threatened with Critical Habitat	Old growth or mature forests with complex structural components (uneven aged stands, high canopy closure, multi-storied levels, high tree density). Prefer canyons with riparian or conifer habitats. Nesting: trees, cliff ledges, or caves.	UNLIKELY: No complex forests or canyons within immediate vicinity of PAA.
Mountain plover *(Charadrius montanus)*	Proposed Threatened	Short-grass plains, sandy desert, and agricultural lands. Nesting: areas with short vegetation, significant areas of bare ground, and flat or gentle slopes. Often associated with prairie dog colonies. Winter: Out of region.	UNLIKELY: No short-grass prairie, agricultural fields, sandy desert, or prairie dog colonies within PAA.
Southwestern willow flycatcher *(Empidonax traillii extimus)*	Endangered with Critical Habitat	Breeding: Dense, riparian habitats. Winter: Out of region.	UNLIKELY: No riparian areas within immediate vicinity of PAA.
Yellow-billed cuckoo *(Coccyzus americanus)*	Candidate	Breeding: Tall cottonwood, mature willow riparian, or deciduous woodlands; moist thickets; orchards; or overgrown pastures. Winter: Out of region.	UNLIKELY: No cottonwood, riparian, or deciduous woodlands; moist thickets; orchards; or overgrown pastures within immediate vicinity of PAA.
MAMMALS			
Black-footed ferret *(Mustela nigripes)*	Endangered	Grasslands, steppe, and shrub steppe. Closely associated with prairie dog colonies (preferably colonies larger than 80 hectares).	UNLIKELY: No prairie dog colonies recorded or observed within immediate vicinity of PAA.

No Federally listed species or appropriate habitat for such species were observed during the biological survey of the proposed action area.

BLM-FFO Special Management Species CSMS)

There are 10 BLM-FFO SMS. The table below lists these species with their habitat requirements and potential to occur in the proposed action area.

BLM-FFO SPECIAL MANAGEMENT SPECIES (SMS)

Species	Habitat	Potential to Occur in Proposed Action Area(PAA)
Aztec gilia *(Aliciella formosa)*	Sandy-clay hills of the Nacimiento formation, desert scrub habitat, elevation 5000-6400 ft.	POSSIBLE: PAA is within BLM-designated habitat "zone" for this species. Geology is Nacimiento, elevation is between 5000 & 6400 ft.
Brack's fishhook cactus *(Sc/erocactus cloveriae* var. *brackii)*	Sandy-clay hills ofthe Nacimiento formation, desert scrub habitat, elevation 5000-6400 ft.	POSSIBLE: PAA is within ELM-designated habitat "zone'' for this species. Geology is Nacimiento, elevation is between 5000 & 6400 ft.
American peregrine falcon *(Falco peregrinus anatum)*	Rugged, semi-open to wooded areas, including open forests, farmlands, and cities. Nesting: Locally, typically ledges on vertical cliffs.	POSSIBLE: PAA is within open shrubland to open woodland habitat.
Bald eagle *(Haliaeetus leucocephalus)*	Typically within 2.5 mi of river or lake that supports fish or waterfowl, but may be in areas where other resources (such as carrion) available.	POSSffiLE: PAA is greater than 2.5 mi from river or lake that supports fish or waterfowl. However, bald eagles could potentially use the PAA for foraging.
Burrowing owl *(Athene cunicularia)*	Open grasslands. Nesting: abandoned animal burrows.	UNLIKELY: No open grasslands within PAA. No prairie dog colonies or other appropriate burrows within PAA.
Ferruginous hawk *(Buteo regalis)*	Open country, including prairies, badlands, sagebrush shrubland, desert scrub, and the periphery of pifion-juniper woodlands. Nesting: lone trees, cliff ledges, rock spires, or powerline towers.	POSSIBLE: Sagebrush shru bland and pifion-juniper periphery habitat found within proposed action area.
Golden eagle *(Aquila chrysaetos)*	Open country, including open forests. Nesting: Cliff ledges or scattered large trees.	POSSIBLE: PAA is within open shrubland to open woodland habitat.
Mountain plover *(Charadrius montanus)*	Areas with very short vegetation, >30% bare ground, and flat to gentle slopes.	UNLIKELY: Habitat within PAA does not include very short vegetation or >30% bare ound.
Prairie falcon *(Falco mexicanus)*	Arid, very open areas, particularly areas with short vegetation, scrub habitat, or large areas of bare ground.	UNLIKELY: No short-grass habitat, scrub habitat, or large areas of bare ground within PAA.
Yellow-billed cuckoo *(Coccyzus americanus)*	Cottonwood woodlands, willow riparian woodlands, deciduous woodlands, moist thickets, orchards, or overgrown pastures.	WOULD NOT OCCUR: No cottonwood, riparian, or deciduous woodlands; moist - thickets; orchards; or overgrown pastures within PAA.

The proposea action area is within the BLM=FFO:determinecr potential nal5ffiif "'Zone,' forAztec gilia and Brack's fishhook cactus species. The geology is Nacimiento and the elevation is approximately 6051 feet. Though the habitat is not generally desert scrub, there are many desert scrub species in the area. Ten-foot-wide pedestrian transect surveys were conducted within the proposed action area for these species. No evidence of either ofthese species was observed.

American peregrine falcons, bald eagles, ferruginous hawks, and golden eagles could potentially utilize the proposed action area for foraging; however, no appropriate nesting habitat for these

raptors is found in the immediate vicinity. No raptors or raptor nests were observed within the proposed action area during the biological survey. There are no recorded nests for any of these species within one-third mile of the proposed action area.

DISCUSSION

USFWS Consultation

The proposed action would be in compliance with USFWS Threatened and Endangered Species management guidelines outlined in the September 2002 Biological Assessment (Consultation No. 2-22-01-I-389) conducted for the Farmington Resource Management Plan/Environmental Impact Statement (RMP/EIS) (USDI 2003). No further consultation with the USFWS is required.

Migratory Bird Treaty Act (MBTA)

The Migratory Bird Treaty Act (MBTA) 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 MBTA. 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 two 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 the elements in that agency's formal planning process (such as revision of agency land management plans), including public participation and NEPA analysis as appropriate.

A National MOU between the BLM and the Service was signed on April 12, 2010. Included in the MOU is the stipulation that the BLM evaluate effects of projects on migratory birds. The BLM should identifY where take may have a measurable negative effect on populations, focusing first on species of concern, priority habitats, and key risk factors. The BLM will then implement approaches to lessen such take.

New disturbance would be approximately 2.75 acres within open pinon-juniper woodland and sagebrush shrubland edge habitat. Approximately 100 trees would be removed as a result of the proposed action. No nesting avifauna were observed in the proposed action area.

RECOMMENDED MITIGATION MEASURES

The BLM-FFO Interim Management Policy regarding the Migratory Bird Treaty Act (per Instruction Memorandum No. NM-F00-2010-001, dated February 2010) establishes mitigation measures to minimize the possibility of unintentional take of migratory birds. For projects with less than 4.0 acres of vegetative disturbance, should active nests be observed within the proposed action area, construction would cease and a BLM-FFO biologist should be contacted immediately.

CERTIFICATION

To the best knowledge of NCJ, the proposed action, 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.

Signature of Field Biologist: --:- --:-....10 -":--J$£...:..1 .a.... n-+---- **Date:**]1- ICAI

Ms. Jey Bell
Nelson onsulting, Inc.
835 East Second Avenue, Suite 250
Durango, Colorado
970-375-9703

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APPENDIX A

PROJECT MAPS

Figure 1: Vicinity Map
Burlington Resources Oil & Gas Company LP
Proposed Nye SRC No. 13N
T30N, R11W, Section 12, NMPM
San Juan County, New Mexico

Figure 2: Project Area Map
Burlington Resources Oil & Gas Company, LP
Proposed Nye SRC No. 13N
T30N, R11W, Section 12, NMPM
San Juan County, New Mexico

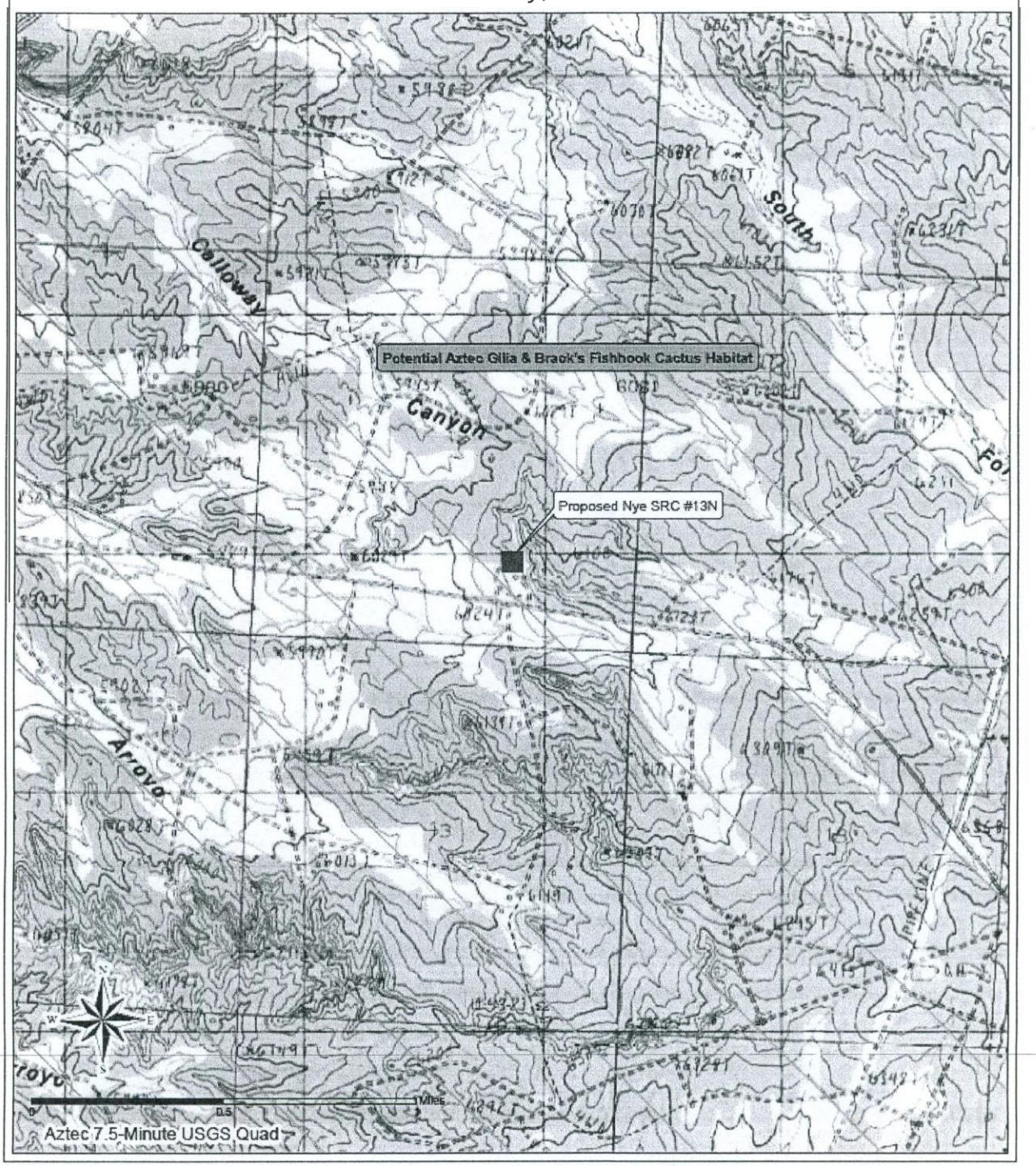
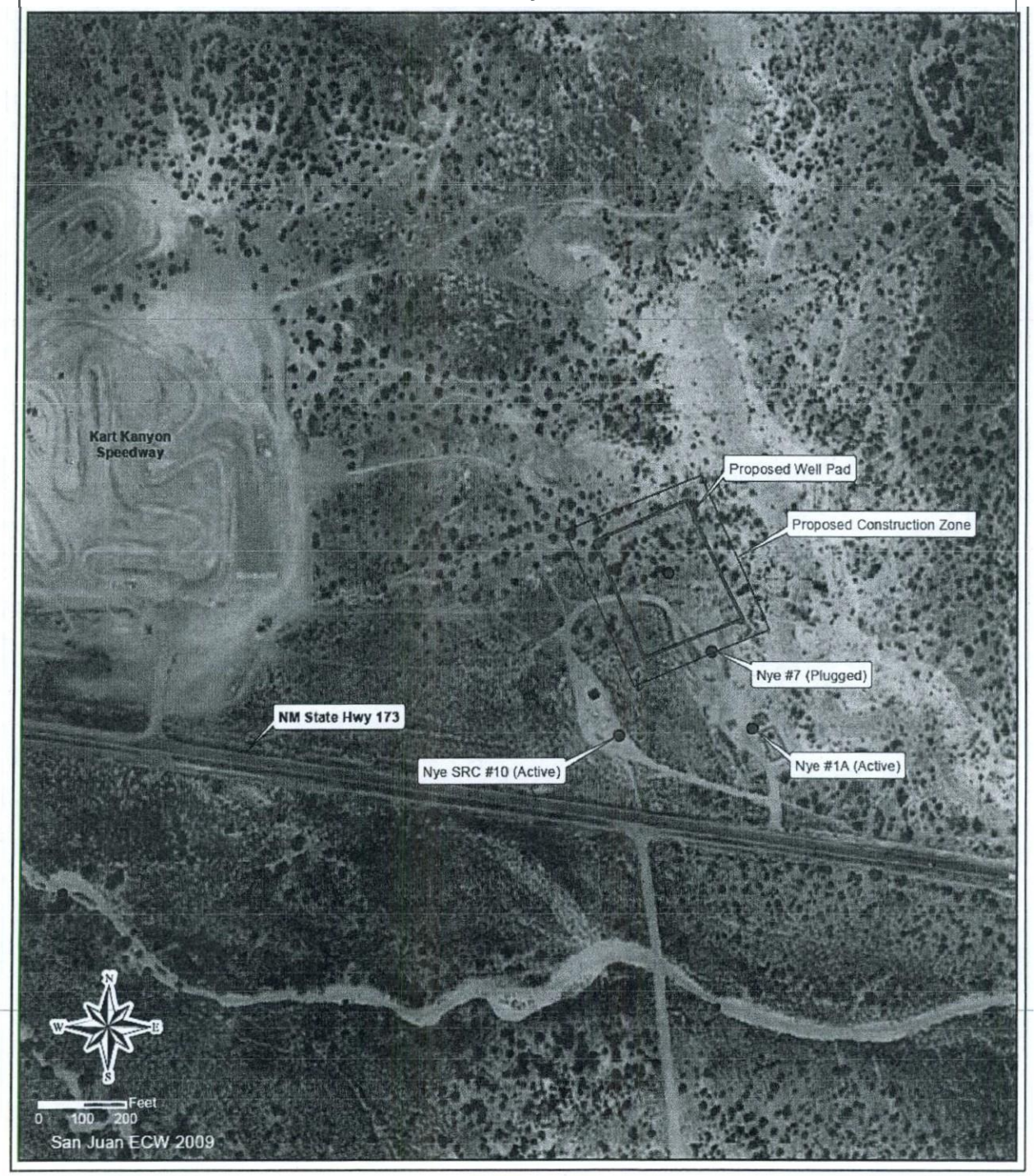
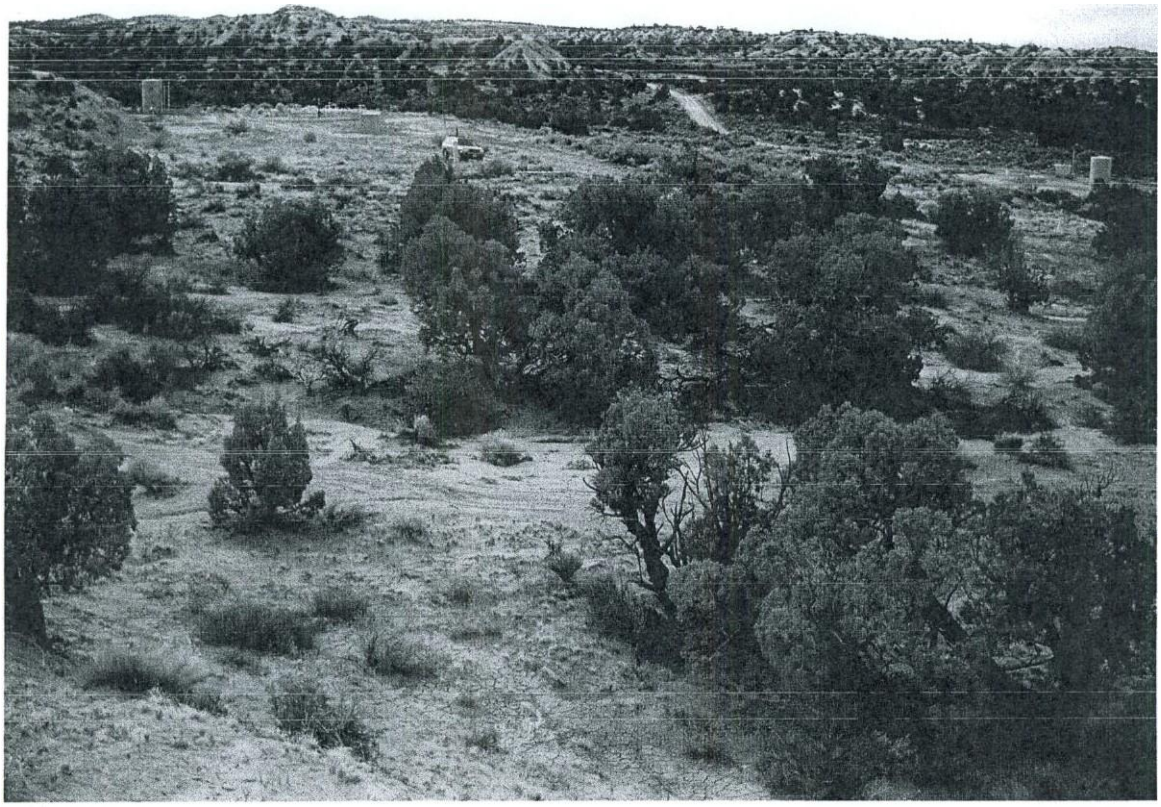


Figure 3: Aerial Photo
Burlington Resources Oil & Gas Company, LP
Proposed Nye SRC No. 13N
T30N, R11W, Section 12, NMPM
San Juan County, New Mexico



APPENDIXB

PHOTOGRAPHS OF PROPOSED ACTION AREA



Overview of entire proposed well pad area, looking southward from badland hills north of proposed well pad

View to north from center well stake

View to center well stake from northern corner (No.5)