ENVIRONMENTAL ASSESSMENT

for the

Hancock Com No. 1B
Well Pad, Access Road, and Pipeline Tie

Burlington Resources Oil and Gas Company, LP
Enterprise Field Services, LLC

BLM EA No. NM-F010-2011-88

Well Pad Location:
1960' FNL & 1050'FEL
Section 1, Township 31 North, Range 13 West,
New Mexico Principal Meridian,
San Juan County, New Mexico

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

October 2010

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BUREAU OF LAND MANAGEMENT
FARMINGTON FIELD OFFICE

ENVIRONMENTAL ASSESSMENT for BURLINGTON RESOURCES OIL AND GAS COMPANY, LP's HANCOCK COM No. 1B WELL PAD AND ACCESS ROAD AND ENTERPRISE FIELD SERVICES, LLC's 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 a Blanco Mesaverde/Basin Dakota gas well. The proposed action would include the construction of the proposed well pad and access road, the drilling and production of the proposed well, the usage of the proposed well pad and access road throughout the life of the well, and the final abandonment of the proposed well, well pad, and access road. In addition, Enterprise Field Services, LLC (Enterprise) would construct, operate, and finally abandon an associated pipeline tie, which would be necessary to transport gas from the proposed well.

The minerals and surface associated with the proposed action are 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, NMNM 010183, issued in 1948. Burlington is a lessee of record and shares operating rights for this 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 the lessee (via an APD) to construct, drill, operate, and finally abandon the proposed well and any associated facilities.

These activities would allow production of Blanco Mesaverde/Basin Dakota 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 Enterprise 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 Fruitland Coal formation is 320 acres per two wells. Spacing for the Blanco Mesaverde and Basin Dakota formations is 320 acres per four wells.

Additionally, Burlington would:

- 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 decision makers 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 3162.3-1 (h)(1). The No Action Alternative would deny the approval of the proposed APD; 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. Associated with this is the construction, usage, and final abandonment of an associated well pad and access road. Enterprise has proposed the construction, operation, and final abandonment of one associated pipeline tie. The action is proposed for 2011.

General Location and Description

Maps of the proposed action area are located on pages five through seven. The proposed action area is plotted on the La Plata, New Mexico, 7.5-minute United States Geological Service (USGS) quadrangle map.

The proposed action area is located in the San Juan Basin of northwestern New Mexico, approximately 13.8 miles north of Farmington, 2.1 miles east of the La Plata River, 2.3 miles east of New Mexico Highway 170 (the La Plata Highway), and 4.7 miles south of the New Mexico/Colorado state line. Elevation is approximately 5809 feet. The proposed well pad would be on a gentle, western slope draining toward McDermott Arroyo, which is located approximately 0.5 mile to the west. Terrain is even. One shallow, ephemeral wash is located within the proposed well pad. Habitat is sagebrush shrubland with scattered juniper trees.

The proposed well would be vertically drilled. The wellhead (surface) and bottom hole location would be 1960 feet from the north line (FNL) and 1050 feet from the east line (FEL) of Section 1, Township 31 North, Range 13 West, New Mexico Principal Meridian (NMPM), San Juan County, New Mexico. All of the proposed action area would be located on BLM land within the southeast quarter of the northeast quarter of Section 1.

Figure 1: Vicinity Map
Burlington Resources Oil & Gas Company LP
Proposed Hancock Com No. 1B
T31N, R13W, Section 01, NMPM
San Juan County, New Mexico

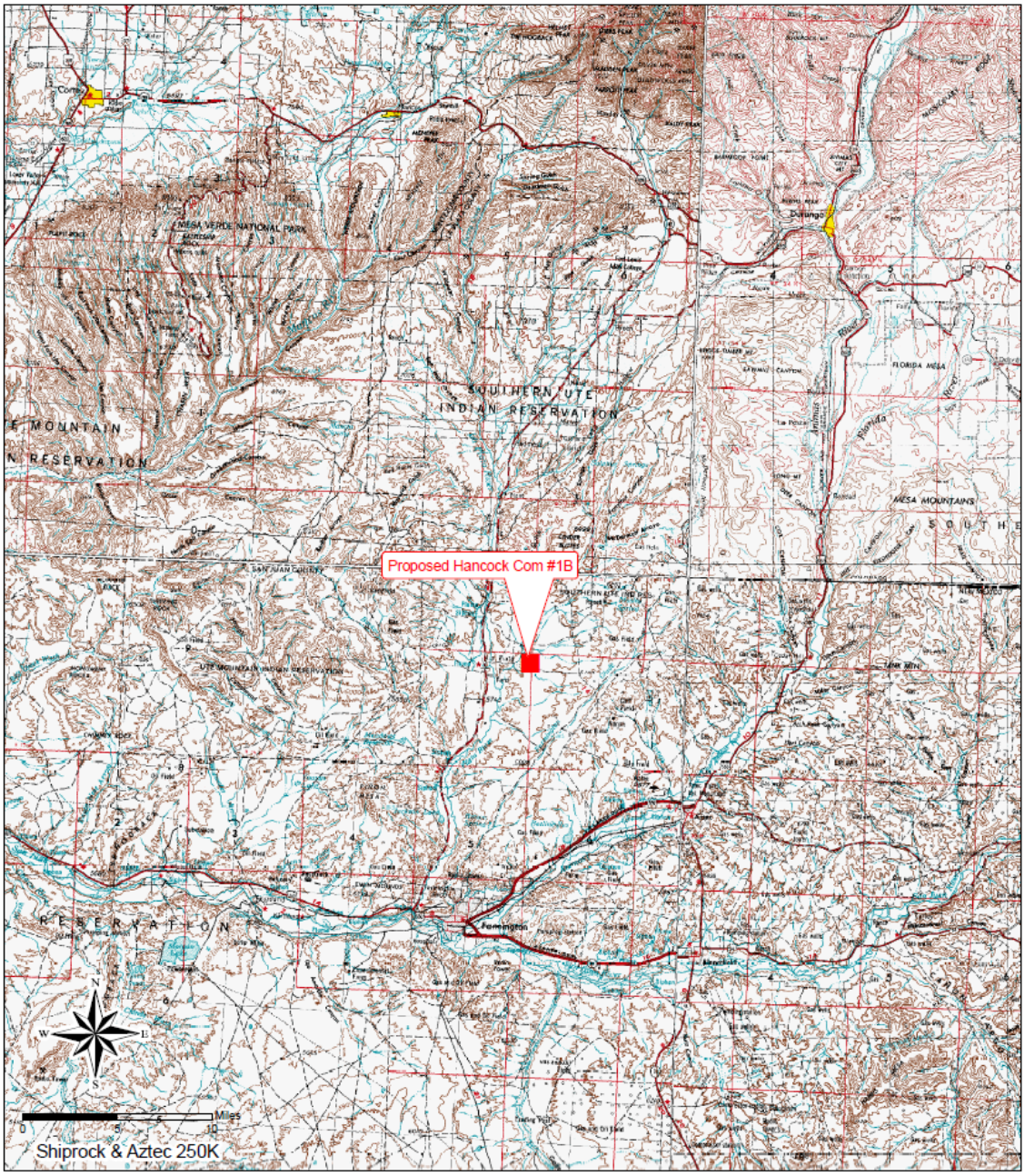


Figure 2: Project Area Map
Burlington Resources Oil & Gas Company LP
Proposed Hancock Com No. 1B
T31N, R13W, Section 01, NMPM
San Juan County, New Mexico

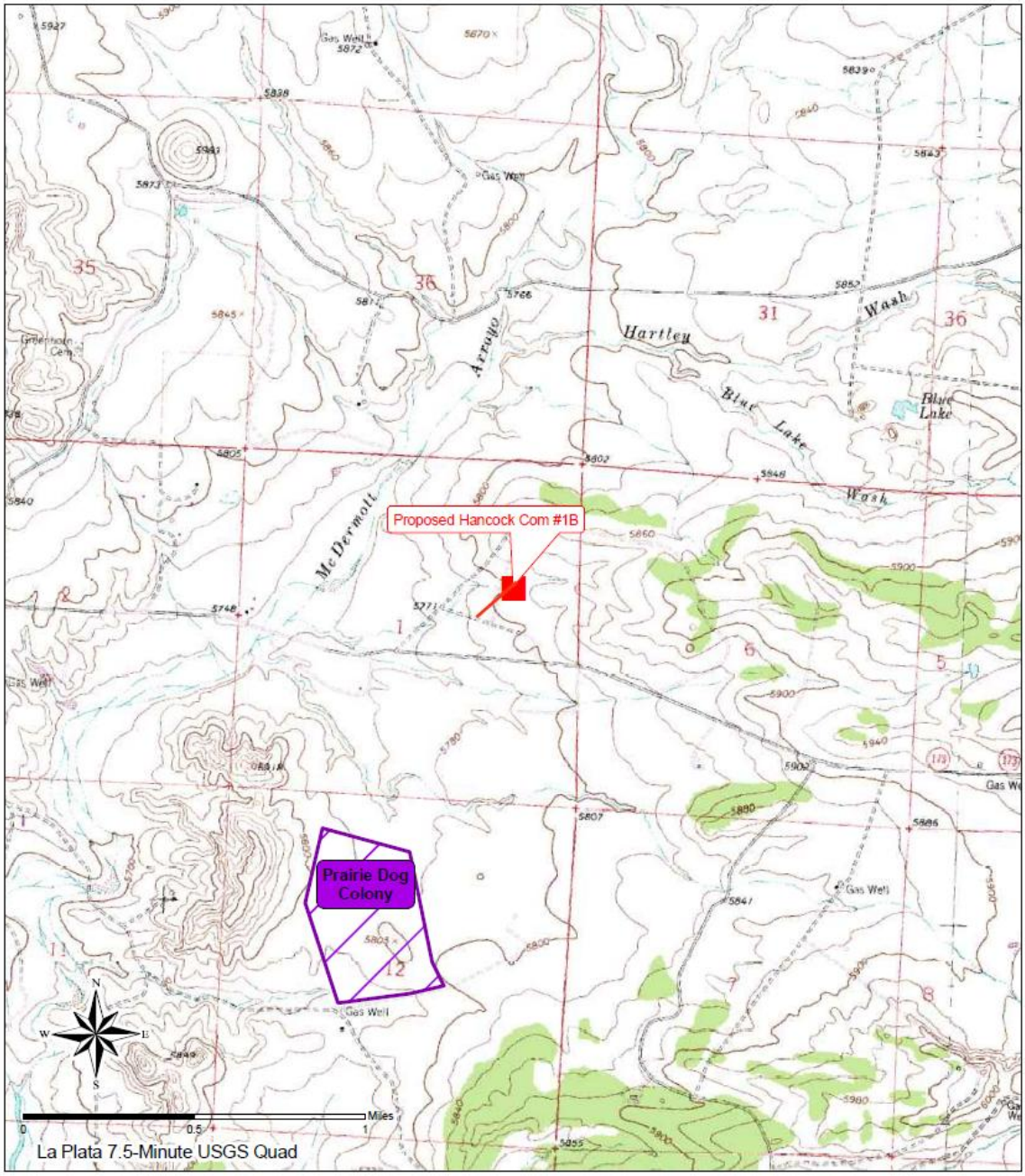
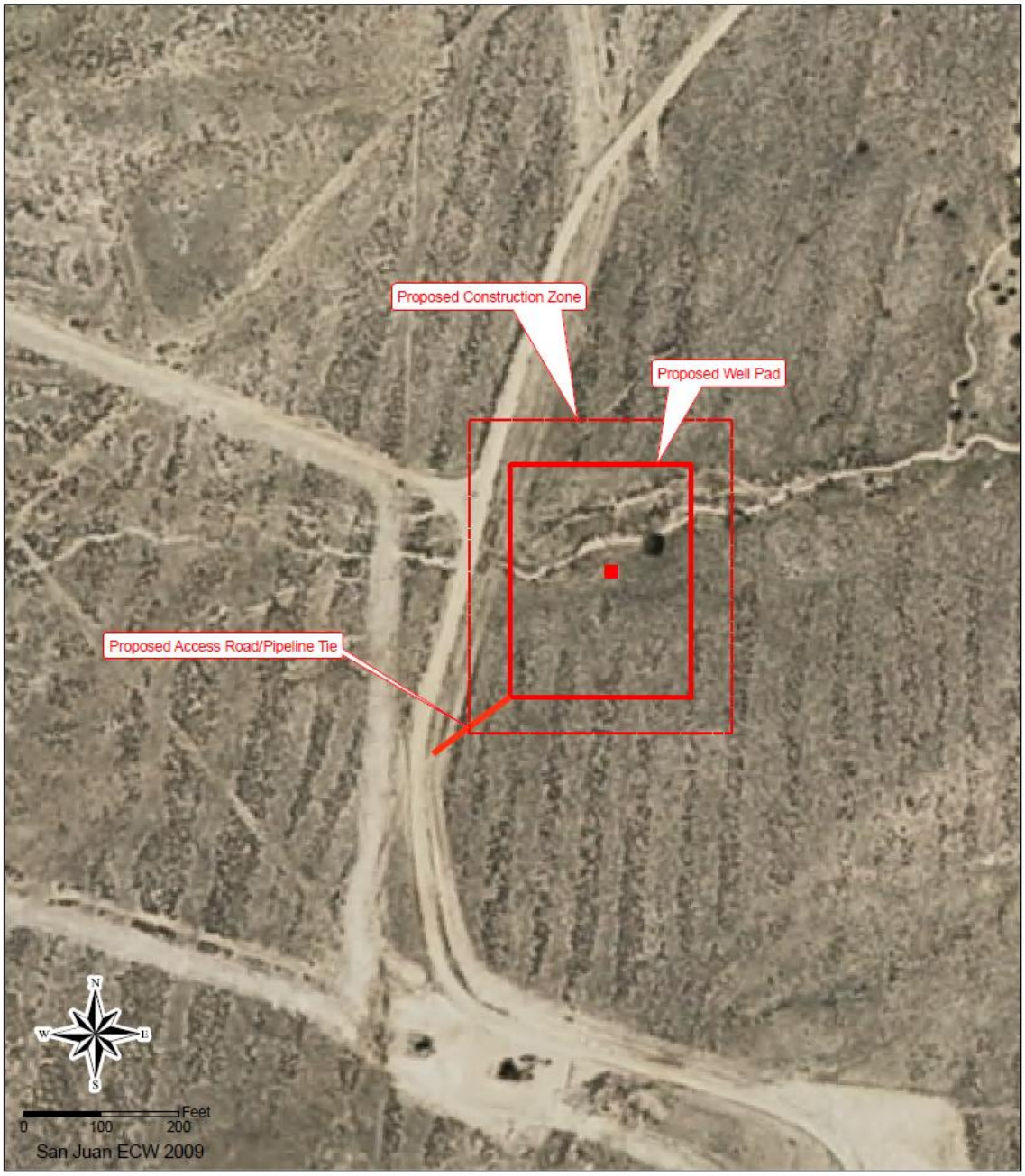


Figure 3: Aerial Photo
Burlington Resources Oil & Gas Company LP
Proposed Hancock Com No. 1B
T31N, R13W, Section 01, NMPM
San Juan County, New Mexico



Construction Phase

The maximum permitted disturbance associated with the proposed action would be approximately 3.14 acres. Actual new disturbance would be approximately 3.04 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. Recommended mitigation measures would be implemented as Conditions of Approval (COAs) to the APD.

TABLE 1: DISTURBANCE ASSOCIATED WITH PROPOSED ACTION

Project Component	Previous/ Existing Disturbance Acreage	New Disturbance Acreage	Total
Access Road	0	0.03	0.03
Well Pad	0.03	3.01	3.04
Pipeline Tie	0.07	0	0.07
TOTALS	**0.10**	**3.04**	**3.14**

Access Road

One 45.0-foot-long, 30-foot-wide access road would be constructed to reach the proposed well pad. This access road would measure 0.03 acre.

Well Pad

One new well pad would be constructed 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. An additional, 25-foot-by-25-foot construction area would be used to construct a drainage overflow feature; this area would be located adjacent to the northeastern corner of the proposed construction zone. Thus, maximum disturbance associated with the well pad would be 3.04 acres. However, 0.03 acre of the proposed construction zone would overlap the disturbance already calculated for the proposed access road. Thus, new disturbance associated with the well pad would be approximately 3.01 acres.

The maximum fill would be five feet on the southwestern corner of the pad (No. 2). The maximum cut would be four feet on the northeastern corner (No. 5).

Pipeline Tie

Once the proposed well is completed, a 77.65-foot-long, 40-foot-wide pipeline tie route would be constructed to connect the proposed Hancock Com No. 1B well to the existing Hancock Com No.1 pipeline. The maximum disturbance resulting from the pipeline tie would be approximately 0.07 acre. However, the pipeline tie falls completely within existing road disturbance or disturbance already calculated for the proposed well pad, proposed well pad construction zone, and proposed access road. Thus, there would be no new disturbance associated with the proposed pipeline tie.

Mitigation

Below are site-specific construction mitigation measures determined for the proposed action, per the August 18, 2010 onsite meeting:

- GENERAL CONSTRUCTION:
  - Drainage would occur above the cut along the eastern side of the well pad. Drainage would run from Side B to Corner No. 5, where a silt trap would be constructed. From the silt trap, overflow would run to the northeast (into the shrubland) and to the west (toward Corner No. 3).
  - Excavated materials from cuts would be used on fill portions of the location.
  - The top six inches of topsoil would be stockpiled to be utilized during reclamation.
  - Above-ground structures would be painted Juniper Green to blend with the natural color of the landscape.

- 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 equipment and light 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 well pad not required for production equipment and vehicular access would be reclaimed. This reclaimed area would total approximately 1.81 acres.

- Slopes would be recontoured to pre-construction topographical contours.
- Disturbed areas would be seeded with a BLM-specified seed mixture.

Equipment Onsite

Production equipment may be required to conform to BLM-FFO Noise Notice to Lessees (NTL) standards (Appendix C). The well production equipment that would remain onsite would include 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 production 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 well pad, 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-specified seed mixture.
- The underground pipeline tie would typically be plugged and left in place.

2.3 Alternatives Considered but not Analyzed in Detail

Aside from the No Action alternative, no alternatives to the proposed action were found that would result in less surface disturbance than the proposed action. Therefore, no other alternatives were analyzed.

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 primary 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 reach of the proposed bottom hole, there are two existing well pads, one of which is active (see Figure 3, page 12).

Moseley 1 No. 1

This active well pad (Moseley 1 No. 1) is located approximately 1100 feet west-northwest of the proposed bottom hole location. The Moseley 1 No. 1 well pad is located on private (fee) surface). The Moseley 1 No. 1 drills to the Fruitland Coal formation. Due to the shallowness of this formation, Fruitland Coal wells require a 500-foot offset from all other wells. Thus, a twin on this location would require a very large well pad. Topography and drainage issues prevent twinning the proposed well with this well.

Hancock Com No. 1

The Hancock Com No. 1, located approximately 1000 feet north of the proposed well pad, has been plugged and reclaimed. Constructing the well pad on this location would require directional drilling to the proposed bottom hole and would result in new disturbance acreages similar to or greater than the disturbance associated with the proposed location. Thus, no benefit was seen in analyzing this location as an alternative.

Figure 4: Alternative Locations Map
Burlington Resources Oil & Gas Company LP
Proposed Hancock Com No. 1B
T31N, R13W, Section 01, NMPM
San Juan County, New Mexico

3.0 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 Table 2, below. Following the table, only those resources that have the potential to be affected by the proposed action are discussed.

TABLE 2: POTENTIAL RESOURCES WITHIN THE PROPOSED ACTION AREA

RESOURCE	POTENTIAL TO OCCUR IN THE PROPOSED ACTION AREA OR TO BE AFFECTED BY THE PROPOSED ACTION	FURTHER ANALYSIS?	SECTION
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
Invasive, 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 located in or near a designated Wilderness Area; the proposed action would not affect any Wilderness Areas.	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 present in the proposed action area; such areas would not be affected by the proposed action.	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; such areas would not be affected by the proposed action.	NO	
Wetlands/ Riparian Zones	No surface water resources, seeps, or springs are present within the proposed action area; no such resources would be affected by the proposed action.	NO	

RESOURCE	POTENTIAL TO OCCUR IN THE PROPOSED ACTION AREA OR TO BE AFFECTED BY THE PROPOSED ACTION	FURTHER ANALYSIS?	SECTION
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 would result in net habitat loss, and may result in habitat fragmentation for wildlife species.	YES	3.13, 4.13
Migratory Birds	The proposed action would result in net habitat loss, and may result in habitat fragmentation for migratory bird species.	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	No wild horses or burros are present in the proposed action area; these animals would not be affected by the proposed action.	NO	
Recreation	The proposed action area is not within any designated recreation areas.	NO	
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	3.17, 4.17
Noise	Construction, drilling, and production activities and facilities may result in a change in area noise.	YES	3.18, 4,18
Paleontology	BLM-FFO lands are designated as Very High Potential paleontological resource areas, thus requiring an assessment at the project level.	YES	3.19, 4.19

3.1 Air Resources

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

The 2003 RMP discussed ozone in the Baseline Air Quality and Impact Assessment sections. The National Ambient Air Quality Standard (NAAQS) at the time was 0.084 ppm. In March of 2008, the Environmental Protection Agency (EPA) announced a new primary 8-hour standard of 0.075 ppm.

Increased development in the Four Corners area, including a proposed new coal-fired power plant, increased oil and gas development, and population growth are all contributing to air quality concerns. Many residents are concerned with potential health impacts from other pollutants. An overall haze and plume of nitrogen oxides can often been seen in the skies, which impact visibility, and there are concerns for the ecosystem due to deposition of mercury and nitrogen.

In addition, the Environmental Protection Agency (EPA), on October 17, 2006, issued a final ruling on the lowering of the National Ambient Air Quality Standard (NAAQS) for particulate matter ranging from 2.5 micron or smaller particle size. This ruling became effective on December 18, 2006, stating that the 24-hour standard for PM2.5, was lowered to 35 ug/m³ from the previous standard of 65 ug/m³. This revised PM2.5 daily NAAQS was promulgated to better protect the public from short-term particle exposure.

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

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

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

Air Quality

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

Air quality in the area near the proposed well is generally good and is not located in any of the areas designated by the Environmental Protection Agency as “non-attainment areas” for any listed pollutants regulated by the Clean Air Act. During the summers of 2000 through 2002, ozone levels in San Juan County were approaching

non-attainment. Additional modeling and monitoring was conducted by Alpine Geophysics, LLC and Environ International Corporations, Inc., in 2003 and 2004. Results of the modeling suggest the episodes recorded in 2000 through 2002 were attributable to regional transport and high natural biogenic source emissions. The model also predicted that the region will not violate the ozone NAAQS through 2007 and that the trends in the 8-hr ozone values in the region will be declining in the future. At the present time, the San Juan County is classified as in attainment with the revised federal ozone standard of 0.075 ppm. Rio Arriba County is unclassified because of there are no ozone monitors sited in Rio Arriba County.

Greenhouse gases, including carbon dioxide (CO_2) and methane (CH_4), and the potential effects of GHG emissions on climate, are not regulated by the EPA under the Clean Air Act. However, climate has the potential to influence renewable and non-renewable resource management. The EPA's Inventory of US Greenhouse Gas Emissions and Sinks found that in 2007, total U.S. GHG emissions were over 7 billion metric tons and that total U.S. GHG emissions have increased by 17 percent from 1990 to 2007. Emissions increased from 2006 to 2007 by 1.4 percent (99.0 Tg CO2 Eq.). The following factors were primary contributors to this increase: (1) cooler winter and warmer summer conditions in 2007 than in 2006 increased the demand for heating fuels and contributed to the increase in the demand for electricity, (2) increased consumption of fossil fuels to generate electricity and (3) a significant decrease (14.2 percent) in hydropower generation used to meet this demand (EPA 2009).

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

Climate

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

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

A 2007 US Government Accountability Office (GAO) Report on Climate Change

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

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

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 proposed action area. Blue Lake is approximately 1.2 miles to the east-northeast, and the La Plata River is approximately 2.1 miles to the west. One shallow, ephemeral drainage crosses the proposed well pad. 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 salinity 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 Formation; 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 aquifer are the Mesa Verde aquifer, the Dakota-Glen Canyon aquifer, and the Coconino-DeChelly 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 (1) 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 (1) the waste came from down-hole or (2) the waste was generated by contact with the oil and gas production stream during removal of produced water or other contaminants, the waste is most likely to be considered exempt by the 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.

There are currently no known hazardous or solid waste materials within the proposed action area or within the vicinity.

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 disproportionately 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 San Juan County, the State of New Mexico, and the federal government. Many County and local contractors and their employees are employed in some aspect of the oil and gas industry.

3.5 Cultural Resources

The proposed action 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:

- PaleoIndian (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),
- Historic - Native American as well as later Hispanic and Euro-American settlers (A.D. 1540 to present)

Detailed descriptions of these various periods, and the select phases within each period, are provided in the BLM-FFO's PRMP/FEIS (BLM 2003b). This information will not be reiterated here. Additional information is also included in an associated document: Cultural Resources Technical Report (BLM 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 La Plata Watershed. Based on the CRTR, a total of 1071 sites, representing 1621 temporal/cultural components, have been documented within the watershed (BLM 2003b). Of the 19 categories of sites defined based on temporal/cultural affiliation, 17 are represented in the watershed. Lacking in the watershed are sites attributed to Paleo and Apache occupations. The most frequently occurring cultural affiliations are Basketmaker II through Pueblo III period components (71 percent) and "General Unknown" period components (15 percent). (BLM 2003b:3-9). Features common to these sites include roomblocks, hearths, and mounds.

A BLM Class I literature review was conducted by Aztec Archaeological Consultants, LLC (AAC) prior to the cultural resources inventory for the proposed action. Three previously recorded sites are located within one-quarter mile of the proposed action area. None of these sites are within the proposed action area's cultural buffer zone.

The proposed action area and a 100-foot cultural buffer zone were surveyed at a BLM Class III level (100 percent) by AAC. An inventory report was prepared and submitted to the BLM-FFO (AAC-2010-015, BLM Report No. 2010(IV)021F) in accordance with the *Procedures for Performing Cultural Resources Fieldwork on Public Lands in the Area of New Mexico BLM Responsibilities (*BLM 2005). No new cultural sites were encountered. One isolate was recorded. No National Register of Historic Places-eligible (NRHP-eligible) cultural resources were encountered.

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 has defined TCPs as follows:

> A Traditional cultural property...can be defined generally as one [a property] that is eligible for the National Register because of its association with cultural practices or beliefs of a living community that (a) are rooted in that community's history, and (b) are important in maintaining the continuing cultural identity of the community (National Register Bulletin 38).

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

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

- The American Indian Religious Freedom Act of 1978 (AIRFA; 42 USC 1996, P.L. 95-431 Stat. 469):
  - ✓ Possession of sacred items
  - ✓ Performance of ceremonies
  - ✓ Access to sites
- Executive Order 13007 (24 May 1996):
  - ✓ Access and use of sacred sites
  - ✓ Integrity of sacred sites
- The Native American Graves Protection and Repatriation Act of 1990 (NAGPRA; 25 USC 3001, P.L. 101-601):

- ✓ Protection, ownership, and disposition of human remains,
- ✓ Protection, ownership, and disposition of associated funerary objects
- ✓ Protection, ownership, and disposition of unassociated funerary objects
- ✓ Protection, ownership, and disposition of sacred objects
- ✓ Protection, ownership, and disposition of 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, reviews of existing published and unpublished literature and the site-specific cultural resources inventory served to identify any TCPs in the area. In addition, the BLM-FFO cultural resources program was contacted for information regarding the presence of TCPs identified through ongoing BLM tribal consultation efforts. There are no known TCPs in the vicinity of the proposed action area.

3.7 Federally Listed Threatened or Endangered Species

There are nine federally (USFWS) listed Threatened, Endangered, or Candidate species with potential to occur in San Juan County, New Mexico. Table 3, below, lists these species with their status, habitat, and potential to occur within the proposed action area.

TABLE 3: FEDERALLY LISTED (USFWS) THREATENED, ENDANGERED, AND CANDIDATE 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 piñon-juniper-sagebrush communities. Elevation ~5900-6560 ft.	UNLIKELY: No rolling, gravelly hills within 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: No dry, low exposed hills or mesas in full sun within PAA.
FISH			

Species	Federal Status	Habitat	Potential to Occur in Proposed Action Area (PAA)
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 sources within 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 sources within 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. Nest in trees, cliff ledges, or caves.	UNLIKELY: No complex forests or canyons within PAA.
Southwestern willow flycatcher (*Empidonax traillii extimus*)	Endangered with Critical Habitat	Breeding habitat: dense, riparian habitats. Winter: out of region.	UNLIKELY: No riparian areas within PAA.
Yellow-billed cuckoo *(Coccyzus americanus)*	Candidate	Breeding habitat: 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 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 burrows within immediate vicinity of PAA; no grassland, steppe, or shrub steppe habitat within PAA.

Based on habitat and range, no federally listed species have the potential 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). Invasive 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 of 212 invasive and poisonous weeds have been identified on public land administered by the BLM-FFO (Heil and White 2000).

No federally listed or New Mexico-listed noxious weeds are present in the proposed action area. Russian thistle (*Salsola iberica*) and cheatgrass (*Bromus tectorum)* are very thick on the site; these species are known to outcompete native species throughout the Four Corners region.

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 conventional. New Mexico alone provides approximately 95 percent of the San Juan 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 of 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 the Nacimiento Uplift to the east. In total, the San Juan Basin covers a surface of approximately 4,600 square miles. The soils in the San Juan Basin were formed primarily from two kinds of parent material: alluvial sediment and sedimentary rock. The alluvial sediment is material

that was deposited in river valleys and on mesas, plateaus, and ancient river terraces. The material has been mixed and sorted in transport and has a wide range of mineralogy and particle size. Sedimentary parent material consists mainly of sandstone and shale bedrock. These shale and resistant sandstone beds form prominent structural benches, buttes, and mesas bounded by cliffs.

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 Blancot-Notal association, gently sloping. This soil unit is found on fans and in valleys with slopes of 0 to 5 percent. The unit is 55 percent Blancot loam, 0 to 5percent slopes and 25 percent Notal silty clay loam, 0 to 2 percent slopes. The remaining 20 percent of the unit is made up of Stumble, Turley, Fruitland, and Uffens soils on fans, valley sides, and valley bottoms. Blancot loam is found on fans and in upland valleys, whereas Notal silty clay loam is found on fans and valley bottoms.

This soil unit is deep and well drained, and formed in alluvium derived dominantly from sandstone and shale. The surface is pale brown loam about two to three inches thick. The subsoil is pale brown and light brownish-gray, clay loam about 13 to 20 inches thick. The substratum, to a depth of 60 inches or more, is light grayish-brown, sandy clay loam. The permeability of the Blancot portion is moderate and the water capacity is high. The permeability of the Notal portion is very slow and the water capacity if very high. The runoff potential for this soil unit is medium, and the hazard of water erosion is moderate. The potential plant community of this soil unit is western wheatgrass, galleta, Indian ricegrass, and fourwing saltbush.

3.11 Watershed/Hydrology

The proposed action area is located in the La Plata watershed. One shallow, ephemeral wash is located within the proposed action area. The proposed action area drains into McDermott Arroyo, approximately 0.5 mile to the west. McDermott Arroyo subsequently flows approximately 2.2 miles south-southwest into the La Plata River.

The La Plata River is a major tributary to the San Juan River. Its headwaters are above 12,000 feet in the La Plata Mountains west of Durango, Colorado. From its headwaters, the river flows due south for approximately 50 miles before entering New Mexico and emptying into the San Juan River west of Farmington. Near the farming communities of Red Mesa and Breen, Colorado, the river is joined by tributaries in Long Hollow, Hay Gulch, and Cherry Creek. Much of the area the La Plata River and its tributaries flow through is remote and uninhabited parts of the Southern Ute Reservation, where some oil and gas development occurs. In New Mexico, Baker Creek and McDermott Arroyo enter the main river from the west and east sides, draining remote, sparsely populated areas with some oil and gas development. Other landowners along the river's course include private individuals and the BLM.

3.12 Vegetation/Forestry

Habitat within the proposed action area is sagebrush shrubland. The dominant shrub species is big sagebrush (*Artemisia tridentate*). Russian thistle is very thick. Cheatgrass and galleta (*Hilaria jamesii*) are the dominant grass species. Juniper (*Juniperus* sp.) trees are lightly scattered throughout the region; one juniper tree is located within the proposed action area. Cover within the proposed action area ranges from approximately 25 to 50 percent.

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 and elk 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 of NMDGF 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 numbers counted appear to 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).

Based on the habitat within the proposed action area, common mammal species likely to occur would be desert cottontail (*Sylvilagus audubonii*), mule deer (*Odocoileus hemionus*), black-tailed jackrabbit (*Lepus californicus*), and coyote (*Canis latrans*). No recorded prairie dog colonies are present within the vicinity of the proposed action area.

3.14 Migratory Birds

Executive Order 13186 dated January 17, 2001 calls for increased efforts to more fully implement the Migratory Bird treaty Act of 1918 (MBTA). In keeping with this mandate, the BLM-FFO has consulted the Partners in Flight Bird Conservation Plan for the State of New Mexico and the U.S. Fish & Wildlife Service'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 piñon-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 are as follows:

TABLE 4: PRIORITY MIGRATORY BIRDS WITH KNOWN DISTRIBUTION IN THE BLM-FFO AREA

Species	Habitat	Potential to Occur in Proposed Action Area (PAA)
Ash-throated flycatcher (*Myiarchus cinerascens)*	-juniper and riparian woodlands.	UNLIKELY: No scrub or woodland habitat within PAA.

Species	Habitat	Potential to Occur in Proposed Action Area (PAA)
Bendire's thrasher (*Toxostoma bendirei)*	Brushy desert, especially areas of tall 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.	UNLIKELY: No woodland habitat within PAA.
Black-throated sparrow *(Amphispiza bilineata)*	Xeric desert habitats dominated by shrubs with bare, open ground.	UNLIKELY: No xeric desert habitats within 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, desert scrub, or prairie dog colonies or other suitable nesting burrows present within PAA.
Cassin's kingbird (*Tyrannus vociferans)*	Found in open country with scattered trees or open woodlands, including piñon-juniper.	POSSIBLE: PAA is located in sagebrush shrubland with very scattered trees.
Gray flycatcher (*Empidonax wrightii)*	Prefers open piñon-juniper forest, often with interspersed ponderosa, with an understory of shrubs.	UNLIKELY: No woodland habitat within PAA.
Gray vireo *(Vireo vicinior)*	Found in desert scrub, mixed juniper or piñon pine and oak scrub associations, and chaparral, in hot, arid mountains and high plains scrubland.	UNLIKELY: No desert scrub, woodland, or chaparral habitat within PAA.
Juniper titmouse *(Baeolophus ridgwayi)*	Warm, dry open woodland, especially juniper woodlands.	UNLIKELY: No woodland habitat within PAA.
Loggerhead shrike (*Lanius ludovicianus)*	Relatively xeric habitats dominated by shrubs and grasses.	POSSIBLE: PAA is located in xeric sagebrush shrubland
Piñon jay (*Gymnorhinus cyanocephalus)*	Found in piñon-juniper woodland, sagebrush, scrub oak, and chaparral communities, and sometimes in pine forests.	POSSIBLE: PAA is located in sagebrush shrubland.
Sage sparrow *(Amphispiza belli)*	Sagebrush-grassland.	POSSIBLE: PAA is located in sagebrush shrubland.
Sage thrasher *(Oreoscoptes montanus)*	Sagebrush plains.	POSSIBLE: PAA is located in sagebrush shrubland.

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. 5016, Farmington Glade, a 23,674-acre allotment that is leased to Montoya Sheep and Cattle

Company, Inc. This allotment, 97 percent of which is public, allows for 140 head of cattle November 1 through May 31, annually. A total of 947 Animal Unit Months (AUMs) are provided by the allotment. No livestock improvements are located within the proposed action area.

3.16 Special Management Species

The BLM-FFO has prepared a list of special management species (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 II of the Sikes Act, as amended; the Federal Land Policy and Management Act (FLPMA) of 1976; and Department of Interior Manual 235.1.1A. BLM-FFO SMS are listed below. Those species warranting further evaluation can be found following the table.

TABLE 5: 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.	UNLIKELY: PAA is not within BLM-designated potential habitat area for this species. Habitat is not desert scrub.
Brack's fishhook cactus (*Sclerocactus cloveriae* var. *brackii*)	Sandy-clay hills of the Nacimiento formation. Desert scrub habitat. Elevation 5000-6400 ft.	UNLIKELY: PAA is not within BLM-designated potential habitat area for this species. Habitat is not desert scrub.
American peregrine falcon *(Falco peregrinus anatum)*	Open habitats (steppes, mountains, open forest, farmland, broad river valleys), preferably areas with nesting cliffs. Nest on ledges or in holes in rock faces. Winter: Out of region.	POSSIBLE: PAA is within sagebrush shrubland, which could provide foraging habitat.
Bald eagle (*Haliaeetus leucocephalus)*	Breeding: typically within 2.5 mi of river or lake that supports fish or waterfowl. Nest in tall trees or cliffs near perennial water. Winter: Open water or areas where other resources (such as carrion) available.	POSSIBLE: PAA is approximately 2.3 miles east of La Plata River. Carrion could potentially be found within PAA, providing foraging for bald eagles.
Burrowing owl *(Athene cunicularia)*	Open grasslands. Nest in abandoned or active mammal burrows, most usually within active prairie dog colonies.	UNLIKELY: No open grasslands or prairie dog colonies within PAA.
Ferruginous hawk (*Buteo regalis*)	Open, arid habitats including grasslands and badlands. Nest on elevated landforms in large open areas (tall trees along rivers or on steep slopes; cliff ledges; river-cut banks; hillsides; powerline towers; on ground in plains or open desert).	UNLIKELY: No suitable open, arid habitat within or near PAA.

Species	Habitat	Potential to Occur in Proposed Action Area (PAA)
Golden eagle *(Aquila chrysaetos)*	Open or semi-open habitats, including deserts, mountains, plateaus, and steppes. Nest on cliff ledges and in trees.	POSSIBLE: PAA is within sagebrush shrubland habitat, which could provide for foraging.
Mountain plover (*Charadrius montanus*)	Short-grass plains, sandy desert, and agricultural lands. Nest in 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 plains, sandy desert, agricultural lands, or prairie dog colonies within PAA.
Prairie falcon (*Falco mexicanus*)	Arid, very open short-grass or scrub habitat with cliff formations. Sometimes open or semi-open agricultural or rural areas. Nest on sheltered ledges on cliffs or embankments.	UNLIKELY: Habitat within PAA is thick sagebrush shrubland.
Yellow-billed cuckoo (*Coccyzus americanus)*	Breeding habitat: tall cottonwood, mature willow riparian, or deciduous woodlands; moist thickets; orchards; or overgrown pastures. Winters: out of region.	UNLIKELY: No cottonwood, riparian, or deciduous woodlands; moist thickets; orchards; or overgrown pastures within PAA or within immediate vicinity of 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.

American peregrine falcon (*Falco peregrinus anatum)*
Peregrine falcons occur most frequently in montane regions, river valleys, and coastlines with rocky cliffs, outcrops, and canyons that are at least 30 feet high, but may be over 1,000 feet high. Peregrine falcons will use almost any open habitat that provides hunting opportunities. Virtually all nest sites are near water. The nest is a scrape or depression dug in gravel on a cliff ledge. Rarely, peregrines will nest in a tree cavity or use an old stick nest. Some peregrines have readily accepted man-made structures as breeding sites. For example, skyscraper ledges, tall towers, and bridges serve as the ecological equivalent of a cliff ledge.

The proposed action area provides potential foraging habitat. No nesting habitat is provided; no ledges or rock faces are present in the surrounding area. The nearest recorded peregrine falcon nest is approximately 16 miles east-northeast of the proposed action area.

Bald eagle (*Haliaeetus leucocephalus)*
Bald eagles typically breed in areas close to (within 2.5 miles of) coastal areas, bays, rivers, lakes, or other bodies of water that provide fish or waterfowl. Nesting most often occurs in tall trees or on cliffs near water. During the winter, bald eagles can frequently be found within the proximity of food resources—typically, these locations will be associated with open water, though in some areas bald eagles use habitat with little or no open water if other food resources (such as carrion) are available. 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.

The proposed action area provides possible foraging habitat, as carrion could occur there. In addition, the proposed action area is approximately 2.3 miles from the La Plata River. Bald eagles would be unlikely to nest within the vicinity of the proposed action area because no suitable trees or sheltered sites are. Bald eagle nest location data is not available for the BLM-FFO.

Golden eagle (*Aquila chrysaetos*)
Golden eagles are mainly found in remote, open, and semi-open hilly regions. They also inhabit montane areas and can be found above timberline. They may inhabit locales with light agricultural use, but are rarely found in rural areas. Nests are built on low embankments, high cliffs, or trees 10 to100 feet above ground and are typically reused for many seasons. Nesting territories may include several alternate nests. Nonbreeding birds may be found in open or semi-open areas that have elevated perches. Golden eagles prey upon hares, ground squirrels, marmots, prairie dogs, and rabbits, which form the bulk of their mammalian diet in summer. Non-hibernating species such as black-tailed and white-tailed jackrabbits, black-tailed prairie dogs, and cottontail rabbits are a mainstay in winter. Young bighorn, elk, mule deer, and pronghorn are regularly preyed upon. Foxes and coyotes are also preyed upon. Upland gamebirds and waterfowl are regionally and seasonally important (Wheeler, 2003).

The proposed action area provides possible foraging habitat. Nesting habitat is not provided within the proposed action area; large trees, embankments, or cliffs are not present in the vicinity. The nearest recorded golden eagle nest is 6 miles east-northeast of the proposed action area.

3.17 Visual Resources

The proposed action area is in a rural area in which existing well pads, access roads, pipeline ROWs, and powerlines are currently present. Residential homes are also present in the area.

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 III. Class III is managed to "…[p]artially retain the existing character of the landscape. The level of change to the landscape should be moderate. Management activities may attract attention, but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape" (2003 RMP/FEIS).

3.18 Noise

From the proposed action area, loud compressor noise can be heard from a nearby well pad. 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 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 any SDAs or ACECs.

3.19 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 a Class 5 designation. Class 5 designations are described as being Very High Potential paleontological resource areas, thus requiring an assessment at the project level (IM 2008-011). The proposed action area is located within the paleontologically rich area of the 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 project 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 fossils. Fossils could occur within or proximate to the proposed action area.

4.0 Environmental Consequences

Alternative A - No Action Alternative

Under the No Action Alternative, neither Alternative B nor an alternate location for the project would be realized. The No Action Alternative would result in the continuation of the current land and resource uses in the action area. There would be no new impacts from oil and gas production to surface resources. Therefore, the No Action Alternative would result in no effect to each resource discussed within this section.

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.

Effects or impacts can either 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 (1) to three (3) years). Long-term effects are substantial and permanent alterations to the pre-existing environmental condition; the effects last longer than three (3) years. 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 – Long term	Total New Disturbance Acreage
Access Road	0	0.03	**0.03**
Well Pad	1.81	1.20	**3.01**
Pipeline Tie	0	0	**0**
TOTALS	**1.81**	**1.23**	**3.04**

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

High — 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.

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

Over the last 10 years, the leasing of Federal oil and gas mineral estate in Farmington Field Office has resulted in an average total of approximately 450 to 500 wells drilled on federal leases annually. These wells would contribute an incremental increase to the total emissions (including GHG's) from oil and gas activities in New Mexico.

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

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

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

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

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

Additional air quality modeling conducted since completion of the 2003 FEIS/RMP and provisions in the ROD for the FEIS/RMP provide for applications of additional emission controls if requested by the NMAQB. Based on this

modeling, the NMAQB issued an interim directive that all newly issued APDs limit compressor emissions to no more than 2 grams per horsepower hour of N_2O for engines of 300 horsepower or less. The FFO has complied with this directive through a condition of approval (COA) which has been in effect since August 1, 2005. To date, NMAQB has made no other such requests.

Currently, development on Federal minerals in New Mexico's San Juan Basin is at a lower level than forecast in the Reasonable Foreseeable Development (RFD) Scenario prepared in 2001 for the FFO EIS/RMP. The impacts forecast by the RFD are still valid. At the time the 2003 EIS/RMP was written, ozone readings did not represent a violation of the NAAQS for this pollutant. The New Mexico Environment Department Air Quality Bureau has determined that the 2007 – 2009 ozone design value for San Juan County is 0.070 ppm. The design value for the county must be greater than the revised 8-hour ozone standard of 0.075 ppm for a nonattainment designation.

The EPA's inventory data describes "Natural Gas Systems" and "Petroleum Systems" as the two major categories of total US sources of GHG gas emissions. The inventory identifies the contributions of natural gas and petroleum systems to total CO2 and CH4 emissions (natural gas and petroleum systems do not produce noteworthy amounts of any of the other greenhouse gases). Within the larger category of "Natural Gas Systems", the EPA identifies emissions occurring during distinct stages of operation, including field production, processing, transmission and storage, and distribution. "Petroleum Systems" subactivities include production field operations, crude oil transportation and crude oil refining. Within the two categories, the BLM has authority to regulate only those field production operations that are related to oil and gas measurement, and prevention of waste (via leaks, spills and unauthorized flaring and venting).

The BLM's regulatory jurisdiction over field production operations has resulted in the development of "Best Management Practices" (BMPs) designed to reduce impacts to air quality by reducing all emissions from field production and operations. Typical measures may include: flare hydrocarbon and gases at high temperatures in order to reduce emissions of incomplete combustion; require that vapor recovery systems be maintained and functional in areas where petroleum liquids are stored; placement of compressors engines 300 horsepower or less must have NOx emissions limited to 2 grams per horsepower hour; revegetate areas of the pad not required for production facilities to reduce the amount of dust from the pads; and water dirt roads during periods of high use in order to reduce fugitive dust emission. The significant threshold for particulate matter of 35 ug/m³ daily PM2.5 NAAQS is not expected to be exceeded under the proposed action alternative.

The EPA data show that improved practices and technology and changing economics have reduced emissions from oil and gas exploration and development (Inventory of US Greenhouse Gas Emissions and Sinks: 1990-2006). One of the factors in this improvement is the adoption by industry of the BMPs proposed by the EPA's Natural Gas Energy Star program. The Farmington Field Office will work with industry and NMAQB to help facilitate the use of the relevant BMPs for

operations proposed on federal mineral leases where such mitigation is consistent with agency policy.

4.2 Surface and Groundwater Quality and Quantity

4.2.1 Direct and Indirect Effects

The disruption of area soils and the increase of barren surface 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. 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. Under the proposed action, short- and long-term impacts to surface hydrology quality and quantity would be low.

Under the proposed action, 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 onsite is also a latent hazard, as displaced fluids could migrate to surface or groundwater resources. With mitigation, short- and long-term effects to groundwater would be moderate.

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. Surface casing 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. For the short and long term, a low increase in socio-economics is anticipated.

4.4.2 Mitigation

No mitigation measures are proposed at this time.

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 of 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 will have no effect on cultural resources (BLM Report No. 2010(IV)021F). This determination would be included with the BLM-FFO cultural resources stipulations, if any, attached to the APD.

4.5.2 Mitigation

All BLM-FFO cultural resources stipulations will 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 earth disturbing construction, project area reduction and/or specific construction avoidance zones, and employee education. All employees, contractors, and sub-contractors of the project will be informed by the project proponent that cultural sites are to be avoided by all personnel, personal vehicles, and company equipment, and that it is illegal to collect, damage, or disturb cultural

resources, and that such activities are punishable by criminal and or administrative penalties under the provisions of the Archaeological Resources Protection Act (16 U.S.C. 470aa-mm).

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

4.6 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 traditional ceremonies and rituals pursuant to AIRFA or EO 13007. There are currently no known threats to remains that fall within the purview of NAGPRA or ARPA. Although no effects have been identified, any heretofore unidentified effect of the proposed action to Native American Religious concerns is expected to be negligible in both the short and long term.

4.6.2 Mitigation

No site-specific mitigation measures have been recommended.

4.7 Federally Listed Threatened or Endangered Species

4.7.1 Direct and Indirect Effects

Based on habitat and range, no federally listed species have the potential to occur within 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 BLM-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 U.S. Fish and Wildlife Service (Service) 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 would be required under the proposed action.

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 the establishment of invasive/noxious weeds. Invasive/noxious plants generally out-compete native species where bare ground is created. Given successful mitigation measures, effects from invasive, non-native species are expected to be low for both 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 Enterprise's 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 Blanco Mesaverde/Basin Dakota reservoirs 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 3.04 acres; of this, 1.23 acres would be disturbed for the long term. 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 moderate for the short and long term.

4.10.2 Mitigation

During interim reclamation, 1.81 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. Interim reclamation would occur following drilling. 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 La Plata 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 3.04 acres of sagebrush shrubland. Disturbance would require the removal of all vegetation within the limits of the proposed action area, including one juniper tree. Following reclamation, there would be 1.23 acres of long-term 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

Following completion of the well, interim reclamation would occur. During interim reclamation, 1.81 acres of new disturbance would be reclaimed. The re-establishment of vegetation is expected to take three (3) to five (5) growing seasons, depending on precipitation.

4.13 Wildlife

4.13.1 Direct and Indirect Effects

The proposed action would result in the disturbance of approximately 3.04 acres. This would include 1.23 acres of long-term disturbance. Disturbance would include one 45-foot-long access road; fragmentation resulting from road construction would be minimal.

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 loss from energy development. Observed shifts in deer distribution as the study progressed were toward less-preferred and presumably less 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 diverse habitat types and broken topography, make assumptions of similar impacts difficult.

The BLM-FFO area contains approximately 633,000 acres of piñon-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 moderate for the short term and long term.

4.13.2 Mitigation

All construction activities would be confined to permitted areas only. All hazards associated with construction and operation would be fenced or contained in storage tanks. Following reclamation, cover reestablishment would minimize impacts to wildlife.

4.14 Migratory Birds

4.14.1 Direct and Indirect Effects

The proposed action would require the removal of approximately 3.04 acres of sagebrush shrubland habitat, including one juniper tree. Following interim reclamation, approximately 1.23 acres of long-term disturbance would remain. 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. 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 low for the short 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 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.

All construction activities would be confined to permitted areas only. Rapid and permanent vegetation and cover reestablishment would minimize impacts to migratory birds. All hazards associated with construction and operation of the proposed action would be fenced or contained in storage tanks.

4.15 Range

4.15.1 Direct and Indirect Effects

The proposed project surface disturbance would result in the short-term loss of 0.12 AUMs and the long-term loss of 0.05 AUMs (at 25.0 acres per AUM) within the Farmington Glade allotment. Dominant vegetation within the proposed action area now includes Russian thistle and cheatgrass; if the area is successfully and immediately revegetated following interim and final reclamation, the proposed project may benefit livestock grazing by providing additional forage above the existing indigenous rate of production. No livestock improvements would be impacted. Impacts to range and grazing livestock are anticipated to be low for the short and long term.

4.15.2 Mitigation

All hazards to livestock and wildlife would be fenced or contained. All project activities would be confined to permitted areas only.

4.16 Special Management Species

4.16.1 Direct and Indirect Effects

Though no SMS are known to occur within the proposed action area, raptor SMS may utilize the area for foraging. Impacts of the proposed action would include changes in vegetation composition and a temporary increase in human intrusion in the area. This human intrusion would result in increased noise, dust, and vehicles. Raptor prey from the construction and drilling areas would be displaced until the completion of drilling.

4.16.2 Mitigation

No mitigation is proposed.

4.17 Visual Resources

4.17.1 Direct and Indirect Effects

The proposed action would result in vegetation alteration and visual scars to the landscape. The proposed action area may be visible from rural residences. Under the proposed action, the management goals associated with VRM Class III would be achieved. With the implementation of BLM-FFO standard and site-specific mitigation measures, the effects of the proposed action on visual resources 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 equipment painted Juniper Green would lessen visual impacts; for safety purposes, some equipment or parts of equipment may be required to be painted other, more appropriate colors. During interim reclamation, 1.81 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 Noise

4.18.1 Direct and Indirect Effects

Under the proposed action, 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 85 dBA. Although modified by topography, the average noise levels decrease below 55 dBA about 1,700 feet from construction sites (SJPLC 2006). Generally, any areas within 1,500 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 7:00 a.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 1,000 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, access road, 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 61dBA 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-term 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 term.

4.18.2 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 action activities would be required to comply with the noise standards as established in NTL 04-2 FFO (Appendix C).

4.19 Paleontology

4.19.1 Direct and Indirect Effects

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

4.19.2 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, project area reduction and/or specific construction avoidance zones, and employee education. Upon review, a determination for final project clearance and stipulations shall be issued by the BLM-FFO.

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

4.20 Residual Effects

The effects of the proposed action that remain after mitigation are residual effects. Residual effects 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 1.23 acres of new, long-term disturbance. 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 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. However, the proposed action would comply with VRM Class III requirements. 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.

4.21 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 will alleviate the cumulative impacts.

Within a one-mile radius of the proposed action area, there are 38 new or active wells on 32 well pads. Assuming an average disturbance area of 1.20 acres per well pad, this represents 38.40 acres of existing well pad disturbance. Within this radius, there are 9.41 miles of existing roads. Assuming an average road width of 30 feet, this totals 34.22 acres of existing road disturbance. Within this radius, there are also approximately 45 acres of additional disturbance associated with rural development. Thus, there are approximately 118 acres of existing disturbance within a one-mile radius of the proposed action area. The proposed action would contribute 1.23 acres of long-term disturbance, a one-percent increase from present levels. The proposed action would contribute 45 feet of road, an increase of less than one percent from present levels.

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 activity resulting in environmental disturbance in the lower reaches of the La Plata Watershed is 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 La Plata 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 the area needed for well pad construction, drilling and the pipelines. 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 drilled from the same well pad location (twinned), 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 La Plata Watershed contains approximately 114,841 acres with an estimated 687 existing oil and gas wells and 3,612 acres of existing long-term oil and gas disturbance (2003 RMP/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 RMP/FEIS, the total, existing and projected, number of wells in the La Plata Watershed is estimated at 1,370. The difference between the number of existing wells and the predicted wells is estimated at 683. This can be taken as a reasonable anticipated future development. Given that the existing roads are adequate, this calculates to approximately 533 additional acres of future long-term well pad development that can be realized in the La Plata Watershed. The total long-term reasonable foreseeable development disturbance would be approximately 2,534 acres. The proposed action, with 1.23 acres of long-term disturbance, represents 0.05 percent of this development.

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
- Roger Herrera –BLM-FFO Environmental Protection Specialist

Burlington
- Steven Merrell

AAC
- John D. Cater
- Patrick Alfred
- Andrew Larsen

Nelson Consulting, Inc. has prepared this environmental assessment document to the standards 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.

6.0 References

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APPENDIX A

SELECTED LAWS AND REGULATIONS GOVERNING

FEDERAL OIL AND 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 Department (NMED)
Clean Water Act (CWA) 1977, as amended. Section 404 Permits.	Surface waters of the U.S., crossing/diversion of ephemeral washes	U.S. Army Corps of Engineers
Federal Water Pollution Control Act and Section 404 of the CWA.	Discharges into surface waters from point sources	New Mexico Water Quality Control Commission (NMWQCC)
Storm Water Pollution Prevention Plan (SWPPP), Section 402 of the CWA	Construction projects disturbing greater than 5 acres. Minimize erosion	USEPA
Safe Drinking Water Act 1974, as amended.	Surface and groundwater	U.S. Environmental Protection Agency (USEPA)
Colorado River Salinity Control Act 1974, amendment of 1984: Public Law 93-320	Mandated Control of Salinity Runoff into the Colorado River Basin	BLM
Federal Land Management and Policy Act (FLPMA) of 1976.	BLM unique areas, ACECs. Issuing of energy related ROWS. Wilderness Areas	BLM
Surface Mining Control and Reclamation Act (SMCRA) of 1977.	Prime and Unique Farm Lands.	Natural Resource Conservation Service (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. Native American Graves Protection and Repatriation Act (NAGPRA) 1990.	Native American Religious Concerns	All Agencies
Endangered Species Act (ESA) 1973 as amended. (Section 7)	Threatened and Endangered plant and animal species	U. S. Fish and Wildlife Service (U.S. FWS)
Bald and Golden Eagle Protection Act	Protection of Eagles	
Migratory Bird Treaty Act	Protection to Migratory Birds, Nests and Eggs.	U.S. FWS
National and New Mexico BLM Instruction Memoranda	BLM and New Mexico State Sensitive Species and Habitat.	BLM
Resource Conservation and Recovery Act (RCRA) of 1976	Use of Hazardous Materials	USEPA
Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) 660 as amended.	Use and Disposal of listed Hazardous Materials.	USEPA
Executive Order No.22898, February 1994.	Environmental Justice for environmental and health conditions in minority and low-income communities.	All Agencies
Federal Noxious Weed Act 1974, as amended and Executive 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 Agriculture.
Mineral Leasing Act (MLA) 1929, as amended. Associated Onshore Orders; National, State and Local.	Issue and managed federal oil and gas leases and related transportation pipelines.	BLM

APPENDIX B

SURVEY PLATS

District I
1625 N. French Dr., Hobbs, NM 88240
District II
1301 W. Grand Avenue, Artesia, NM 88210
District III
1000 Rio Brazos Rd., Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy, Minerals & Natural Resources Department
OIL CONSERVATION DIVISION
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-102
Revised October 12, 2005
Submit to Appropriate District Office
State Lease - 7 Copies
Fee Lease - 3 Copies

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

1 API Number	2 Pool Code	3 Pool Name
		BASIN DAKOTA / BLANCO MESAVERDE

4 Property Code	5 Property Name	6 Well Number
	HANCOCK COM	1B

7 OGRID No.	8 Operator Name	9 Elevation
	BURLINGTON RESOURCES OIL & GAS COMPANY LP	5809

10 SURFACE LOCATION

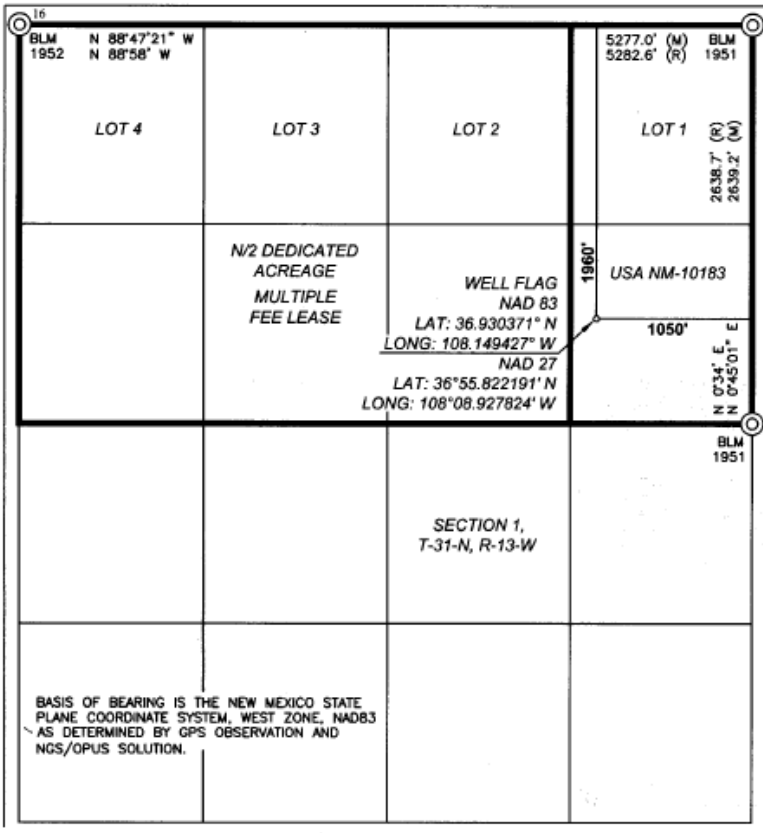
UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
H	1	31-N	13-W		1960	NORTH	1050	EAST	SAN JUAN

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	County

12 Dedicated Acres	13 Joint or Infill	14 Consolidation Code	15 Order No.
319.2			

NO ALLOWABLE WILL BE ASSIGNED TO THIS COMPLETION UNTIL ALL INTERESTS HAVE BEEN CONSOLIDATED OR A NON-STANDARD UNIT HAS BEEN APPROVED BY THE DIVISION



17 OPERATOR CERTIFICATION

I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such a mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.

Signature

Printed Name

Title and E-mail Address

Date

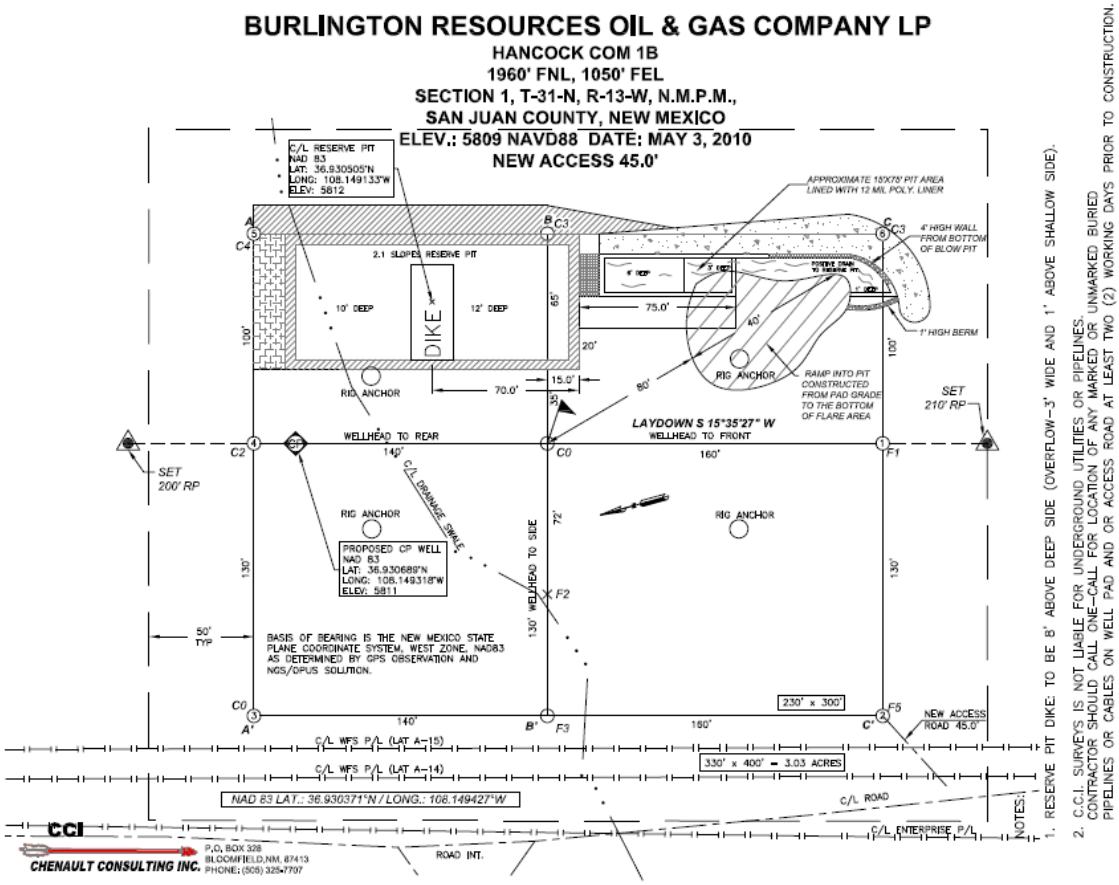
18 SURVEYOR CERTIFICATION

I hereby certify that the well location shown on this plat was plotted from feild 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: 5/3/10
Signature and Seal of Professional Surveyor:

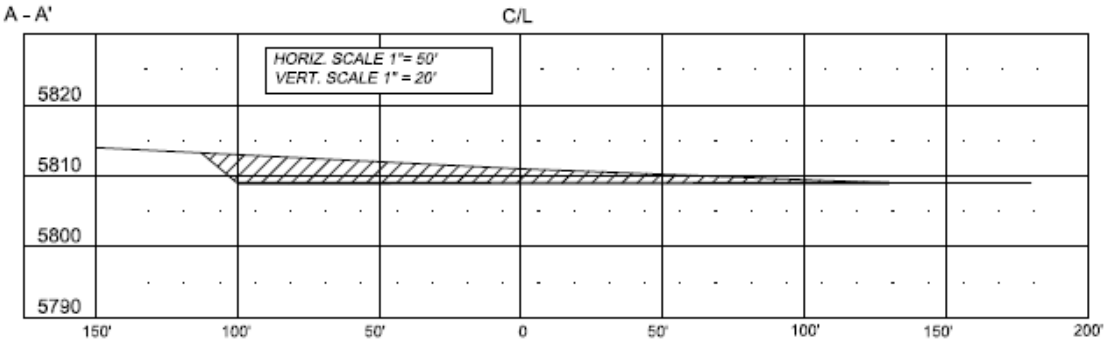
HENRY P. BROADHURST NEW MEXICO 11393 6/17/10 PROFESSIONAL SURVEYOR

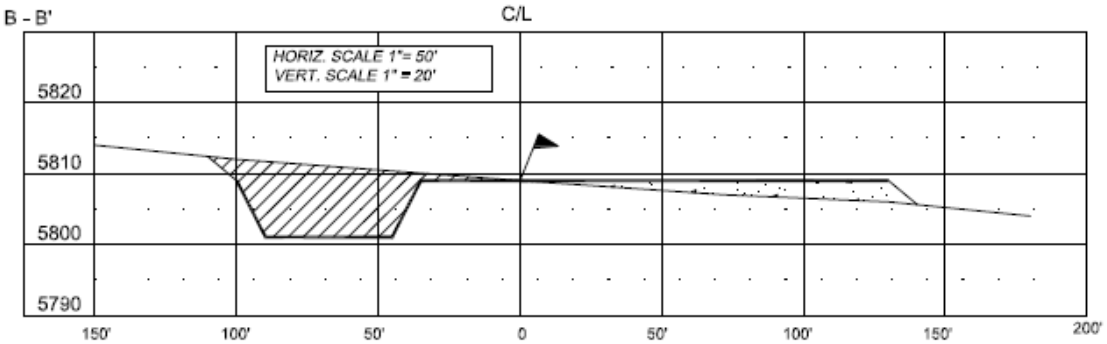
Certificate Number: NM 11393

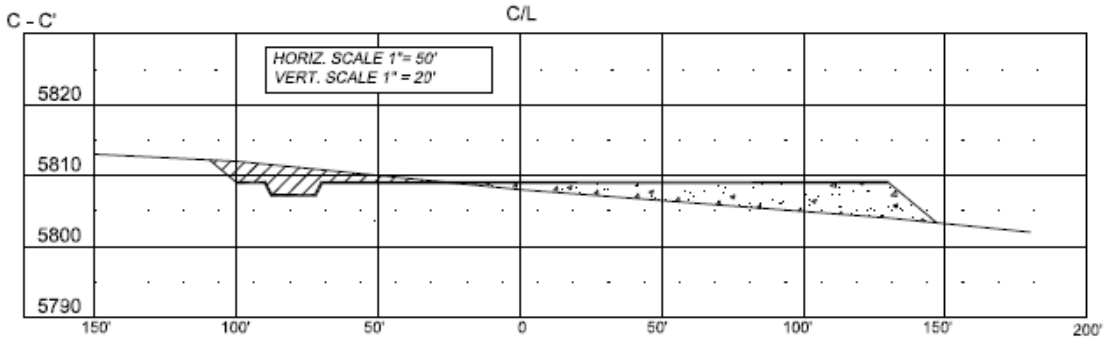

BURLINGTON RESOURCES OIL & GAS COMPANY LP
HANCOCK COM 1B
1960' FNL, 1050' FEL
SECTION 1, T-31-N, R-13-W, N.M.P.M.,
SAN JUAN COUNTY, NEW MEXICO
ELEV.: 5809 NAVD88 DATE: MAY 3, 2010
NEW ACCESS 45.0'
C/L RESERVE PIT
NAD 83
LAT: 36.930505°N
LONG: 108.149133°W
ELEV: 5812
APPROXIMATE 150'X75' PIT AREA LINED WITH 12 MIL POLY. LINER
4' HIGH WALL FROM BOTTOM OF BLOW PIT
2:1 SLOPED RESERVE PIT
10' DEEP
12' DEEP
DIKE
75.0'
1' HIGH BERM
RIG ANCHOR
70.0'
15.0'
RAMP INTO PIT CONSTRUCTED FROM PAD GRADE TO THE BOTTOM OF FLARE AREA
SET 210' RP
LAYDOWN S 15°35'27" W
WELLHEAD TO REAR
WELLHEAD TO FRONT
SET 200' RP
C/L DRAINAGE SWALE
PROPOSED CP WELL
NAD 83
LAT: 36.930689°N
LONG: 108.149318°W
ELEV: 5811
WELLHEAD TO SIDE
BASIS OF BEARING IS THE NEW MEXICO STATE PLANE COORDINATE SYSTEM, WEST ZONE, NAD83 AS DETERMINED BY GPS OBSERVATION AND NGS/OPUS SOLUTION.
50' TYP
230' x 300'
NEW ACCESS ROAD 45.0'
C/L WFS P/L (LAT A-15)
C/L WFS P/L (LAT A-14)
330' x 400' = 3.03 ACRES
NAD 83 LAT.: 36.930371°N / LONG.: 108.149427°W
C/L ROAD
C/L ENTERPRISE P/L
ROAD INT.
CCI
CHENAULT CONSULTING INC.
P.O. BOX 328
BLOOMFIELD, NM. 87413
PHONE: (505) 325-7707
NOTES:
1. RESERVE PIT DIKE: TO BE 8' ABOVE DEEP SIDE (OVERFLOW-3' WIDE AND 1' ABOVE SHALLOW SIDE).
2. C.C.I. SURVEYS 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 AT LEAST TWO (2) WORKING DAYS PRIOR TO CONSTRUCTION.

BURLINGTON RESOURCES OIL & GAS COMPANY

HANCOCK COM 1B
1960' FNL, 1050' FEL
SECTION 1, T-31-N, R-13-W, N.M.P.M.,
SAN JUAN COUNTY, NEW MEXICO
ELEV.: 5809 NAVD88







THIS DIAGRAM IS AN ESTIMATE OF DIRT BALANCE AND IS NOT INTENDED TO BE AN EXACT MEASURE OF VOLUME.

1. SIDE SLOPES ARE DEPICTED AT 3 : 1 UNLESS NOTED OTHERWISE.
2. CCI IS NOT LIABLE FOR UNDERGROUND UTILITIES OR PIPELINES. CONTRACTORS SHOULD NOTIFY ONE-CALL FOR LOCATION OF ANY MARKED OR UNMARKED BURIED PIPELINES OR CABLES ON WELL PAD AND OR ACCESS ROAD PRIOR TO CONSTRUCTION.

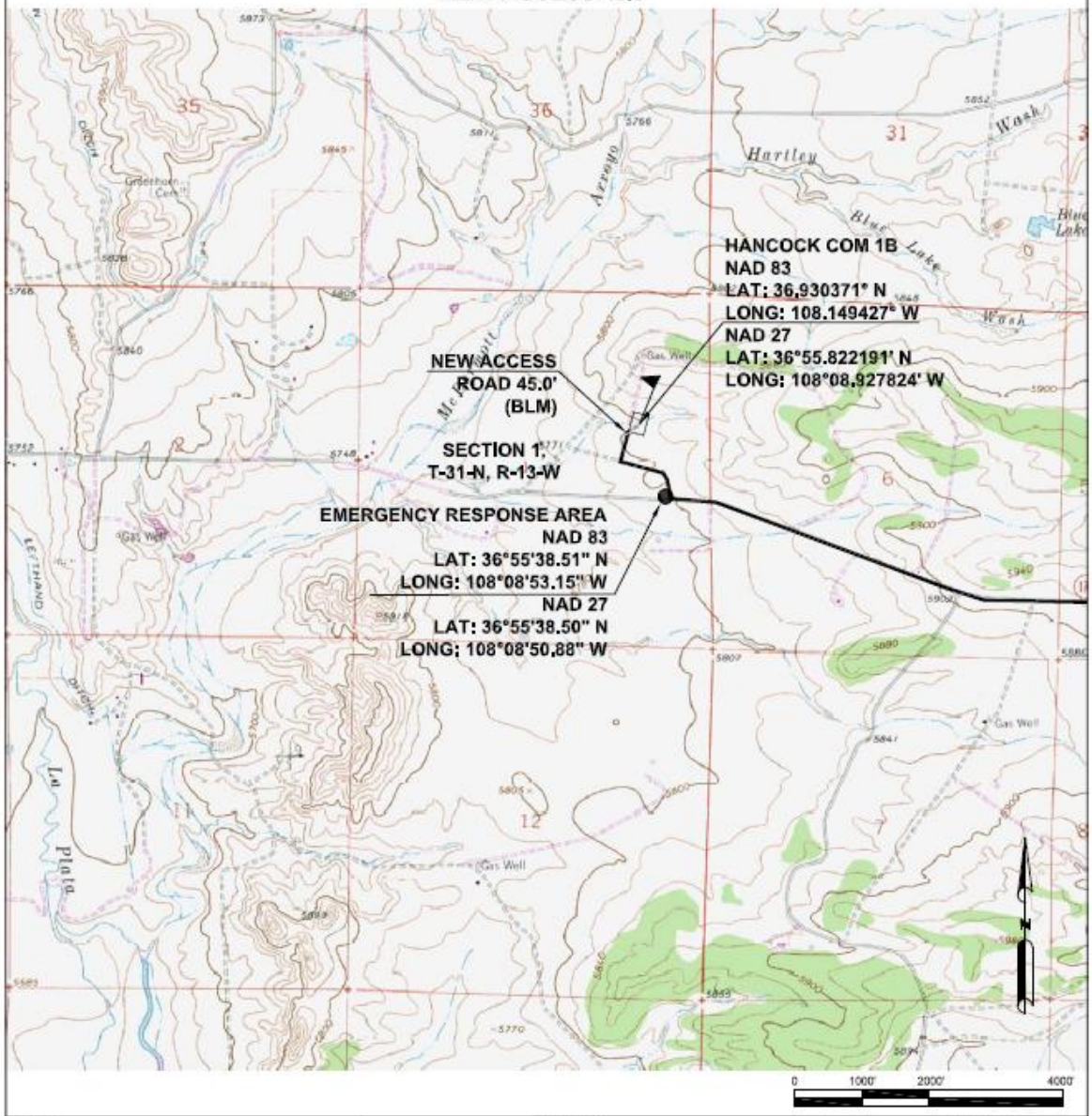
REVISIONS

NO.	DESCRIPTION	REVISED BY	DATE
1	ISSUED FOR REVIEW	LH	6/11/10

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

BURLINGTON RESOURCES OIL & GAS COMPANY LP

HANCOCK COM 1B
1960' FNL, 1050' FEL
SECTION 1, T-31-N, R-13-W, N.M.P.M.,
SAN JUAN COUNTY, NEW MEXICO
ELEV.: 5809 NAVD88
NEW ACCESS 45.0'



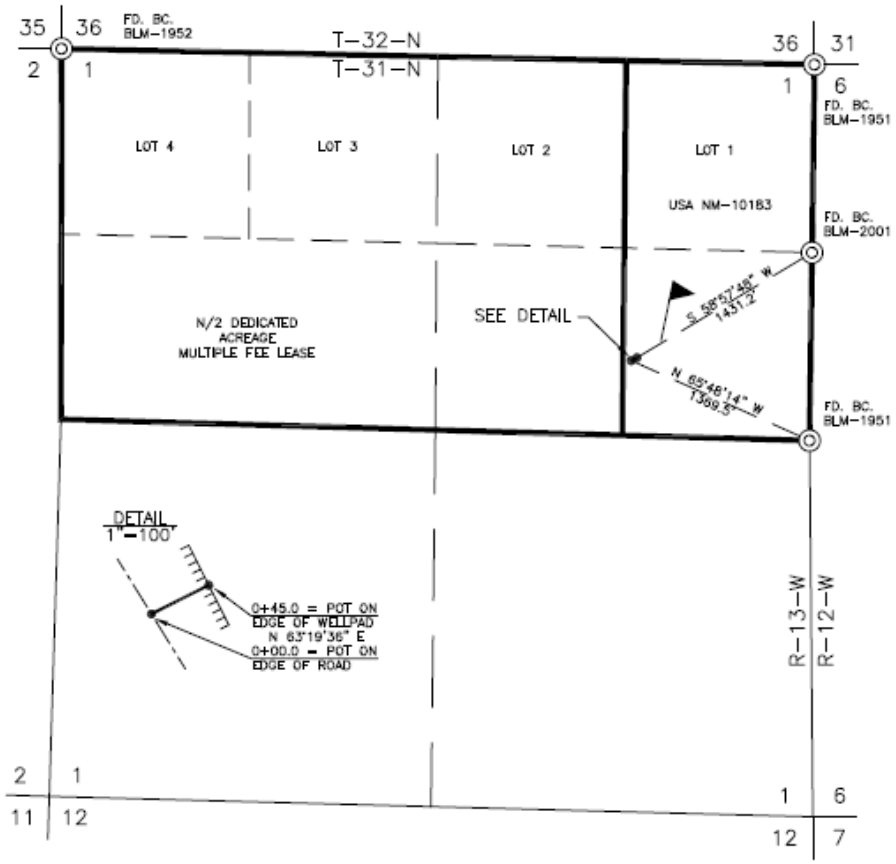
NOTE: .

REVISIONS			
NO.	DESCRIPTION	REVISED BY	DATE
1	ISSUED FOR REVIEW	LH	6/11/10

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

BURLINGTON RESOURCES OIL & GAS COMPANY LP

HANCOCK COM 1B
1960' FNL, 1050' FEL
SECTION 1, T-31-N, R-13-W, N.M.P.M.,
SAN JUAN COUNTY, NEW MEXICO
ELEV.: 5809 NAVD88
NEW ACCESS 45.0'



OWNERSHIP	SUBDIVISION	OWNER	FEET	MILES	ACRES	RODS
	0+00.0 TO 0+45.0	BLM	45.0	0.009	0.021	2.73

0 500' 1000'

NOTE: 1.) BASIS OF BEARING— SET OPUS ADJ. CONTROL POINT "BASE," LOCATED IN THE NE/4, SEC. 1, T-31-N, R-13-W, N.M.P.M. GRID FACTOR: 0.999926343
2.) ALL POSS. AS SHOWN ARE NEW MEXICO STATE PLANE WEST NAD 83

REVISIONS

NO.	DESCRIPTION	REVISED BY	DATE
1	ISSUED FOR REVIEW	LH	6/11/10

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

Enterprise Products

ENTERPRISE FIELD SERVICES, LLC

BLANCO GATHERING SYSTEM

DWG. NO. BLH037-034-01

WO NO.

RW NO.

DATE 07/01/10

SCALE 1" = 1000'

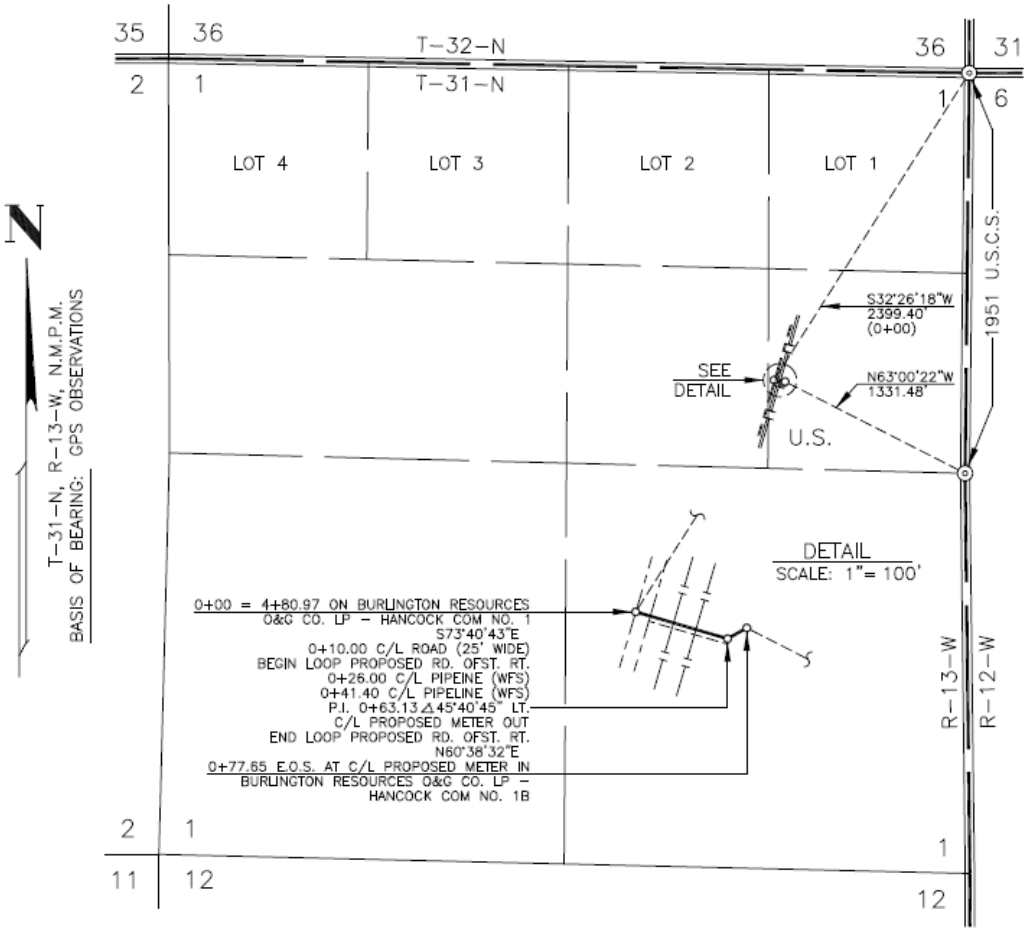
SURVEYED 06/22/10

LINE BURLINGTON RESOURCES O&G CO. LP – HANCOCK COM NO. 1B

FROM 0+00 = 4+80.97 ON BURLINGTON RES. O&G CO. LP – HANCOCK COM NO. 1

(BLH037-003-01, R/W NO. 5870226)(MC NO. 72096)

COUNTY SAN JUAN STATE NEW MEXICO SECTION 01 TOWNSHIP 31-N RANGE 13-W, N.M.P.M.



DWN. BY LB CONSTR. COMMENCED APPL. DWG. SLACK CHAIN

CKD. BY MD CONSTR. COMPLETED DATE PIPE SIZE 4.50" O.D.

PRINT RECORD			PIPE DATA	METER STA. NO.	MV/DK
1	PRELIM PROD	07/06/10			

NOTE: WELL FLAG
SURVEY LOOPS PROPOSED ROAD
LOCATION NOT BUILT

SURFACE LOCATION: 1960' FNL, 1050' FEL

Preliminary

OWNERSHIP

SUBDIVISION	OWNER	LESSEE	METER(S)	RODS	ACRE(S)
SE/4NE/4, SEC. 01	UNITED STATES	MONTOYA SHEEP AND CATTLE CO., INC.		4.706	0.071

REV.

APPENDIX C

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) (NTL 04-2 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 species, 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-oil 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 USBR 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. Haynes Trading Post	31. Tapacito and Split Rock
2. ***Bee Burrow	17. Holmes Group	32. ***Toh-la-kai
3. ***Bis sa'ani	18. ***Indian Creek	33. ***Twin Angels
4. Bi Yaazh	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 Canyon (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. ***Cedar 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. ***Bisti/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., landscape, 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.

New NSAs

- 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 sources 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 3160.5) 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, the BLM will work with applicants and use flexibility 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) 3163.1 by 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

APPENDIX D

PHOTOGRAPHS OF PROPOSED ACTION AREA

View to the north from proposed well pad center stake

View to the east from proposed well pad center stake

View to the south from proposed well pad center stake

View to the west from proposed well pad center stake

View along proposed access road/pipeline tie ROW, from beginning of road to pad