DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
Roswell Field Office
2909 W. Second Street
Roswell, New Mexico 88201

Project: Federal 27 #6 Oil Well
NEPA Log Number: P010-2009-4-EA
Location: 1600' FNL & 1710' FWL, Sec: 27, T7S-R37E
Lease Number: NM-54449
Applicant: H.L. Brown Operating, L.L.C.
Roswell Field Office: (575) 627-0272

Finding of No Significant Impact

Based on the analysis of potential environmental impacts contained in the attached environmental assessment, I have determined the proposed action is not expected to have significant impacts on the environment and that preparation of an Environmental Impact Statement is not warranted.

Prepared by:

____/s/ Brian A. Novosak_____Date_____12/16/2008_____
Brian Novosak,
Natural Resource Specialist

Reviewed by:

___/s/ J. Howard Parman_____Date_____10/28/2008_____
J. Howard Parman
Planning Coordinator

Approved by:

____/s/ Angel Mayes_____Date_____12/19/2008_____
Angel Mayes,
Assistant Field Manager,
Lands and Minerals

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Roswell Field Office
2909 W. Second Street
Roswell, New Mexico 88201

Decision Record

Based upon the analysis, the Federal 27 #6 Oil Well under the Preferred Alternative located 1600' FNL & 1710' FWL, Sec: 27, T7S-R37E, NMPM, Roosevelt County, New Mexico on federal mineral lease NM-54449 is approved. This includes a 300' x 300' well pad on private surface. There will be no new access road. The total surface disturbance will aggregate approximately 2.0 acres.

Rationale: The Bureau of Land Management staff has reviewed the environmental assessment and identified site-specific mitigation measures to avoid or minimize surface impacts resulting from the construction of this project. The well pad will remain as long term impacts. The cumulative impacts to the environment from existing and new development have been identified.

The proposed action is in conformance with the 1997 Roswell Resource Management Plan 1997, as amended, and conforms to the land-use planning terms and conditions required under 43 CFR 1610.5. This action does not conflict with existing Roosevelt County land-use planning or zoning.

Administrative Review and Appeal: Under BLM regulations, this Decision Record (DR) is subject to administrative review in accordance with 43 CFR 3165. Any request for administrative review of this DR must include information required under 43 CFR 3165.3(b) (State Director Review), including all supporting documentation. Such a request must be filed in writing with the State Director, Bureau of Land Management, 1474 Rodeo Road, Santa Fe, NM 87505, no later than 20 business days after this DR is received or considered to have been received.

Any party who is adversely affected by the State Director's decision may appeal that decision to the Interior Board of Land Appeals, as provided in 43 CFR 3165.4.

Approved by:

/s/ Angel Mayes Date 12/19/2008
Angel Mayes,
Assistant Field Manager,
Lands and Minerals

BUREAU OF LAND MANAGEMENT
ROSWELL FIELD OFFICE

December 24, 2008

NEPA DOCUMENT# P010-2009-4-EA
Federal 27 #6 Oil Well – H.L. Brown, LLC.

1.0 Introduction

This analysis tiers to and incorporates by reference the information and analysis contained in the Roswell Resource Area Resource Management Plan (RMP), as amended and addresses site-specific resources and/or impacts that are not specifically covered within the RMP, as required by the National Environmental Policy Act of 1969 (NEPA), as amended (Public Law 91-90, 42 U.S.C. 4321 et seq.). The RMP is available for review at the Roswell Field Office.

1.1 Purpose and Need

The purpose of this environmental assessment is to analyze the impacts of development on the federal oil and gas lease NM-54449.

1.2 Conformance with Applicable Land Use Plan and Other Environmental Assessments

The proposed action conforms to 1997 Roswell RMP, as amended. The proposed action is in conformance with the applicable LUP because it is specifically provided for in the following LUP decisions:

> Minerals Management, Fluid Minerals Goal: *Provide for the leasing, exploration and development of oil and gas resources within the Roswell Resource Area.*

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

EPA has finalized changes to its storm water regulations as they apply to field operations, including construction activities, at oil and gas exploration, production, processing or treatment operations or transmission facilities. This final action codifies changes resulting from Clean Water Act amendments in the Energy Policy Act of 2005 signed by the President on August 8, 2005. The Administrator of EPA signed the final rule on June 7, 2006 which was published in the Federal Register, and is effective on June 12, 2006. You can view the rule and a descriptive Fact Sheet at: http://www.epa.gov/npdes/stormwater/oilgas. The final rule specifies that storm water discharges from oil and gas-related construction activities are exempt from NPDES permit coverage, except in very limited instances. EPA interprets this exclusion to apply to construction of drilling sites, waste management pits, and access roads, as well as construction of the transportation and treatment infrastructure such as pipelines, natural gas treatment plants, natural gas pipeline compressor stations, and crude oil pumping stations. Construction activities that

result in a discharge of a reportable quantity release or that contribute pollutants (other than non-contaminated sediment from construction) to a violation of a water quality standard are still subject to permit coverage. This final action also adds complementary text encouraging operators of oil and gas field activities or operations to implement and maintain Best Management Practices (BMPs) to minimize erosion and control sediment during and after construction activities to help ensure protection of surface water quality during storm events. This rulemaking applies to all States, Federal lands and Indian Country regardless of whether EPA or a State is the NPDES permitting authority. However, this rule is not intended to interfere with the States' authority to regulate any discharges, pursuant to state law, through a non-NPDES permit program. Additionally, an U.S. Army Corps of Engineers Section 404 permit for the discharge of dredge and fill materials may also be required. Additionally, a New Mexico Surface Water Quality Bureau 401 certification may also be required under a U.S. Army Corps of Engineers Section 404 permit. Operators are required to obtain all necessary permits and approvals prior to any disturbance activities.

Roswell Field Office staff reviewed the proposed action and determined it would be in compliance with threatened and endangered species management guidelines outlined in Biological Assessments Cons. #2-22-96-F-102, Cons. #22420-2006-I-0144, and Cons. #22420-2007-TA-0033. No further consultation with the U.S. Fish and Wildlife Service is required. .

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

Additionally, the Operator is required to:

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

The proposed project would not be in conflict with any State, local, or county plans.

2.0 Alternatives Including the Proposed Action

2.1 Alternative A – No Action

The BLM NEPA Handbook (H-1790-1) and the National Environmental Policy Act and associated Code of Federal Regulations state that for EAs on externally initiated proposed actions, the No Action Alternative means that the proposed activity would not take place. The

No Action Alternative is presented for baseline analysis of resource impacts, and if selected, would deny the approval of the proposed application. Current land and resource uses would continue to occur in the proposed project area. No mitigation measures would be required.

2.2 Alternative B – Proposed Action

H.L. Brown, LLC submitted a Notice of Staking on July 21, 2008, to drill the Federal 27 #6 oil well on private surface accessing federal minerals. An on-site inspection was conducted on August 7, 2008. The Application for Permit to Drill was submitted and considered administratively complete on December 16, 2008.

Access Road:

The entire access road system is 10,000 feet (1.9 miles) in length from Roosevelt County Road 262 to the well pad. Continuing from Roosevelt County Road 262, the off-lease access is existing road wholly upon private surface and does not require a BLM issued right-of way. The existing road has a driving surface (travelway) of 14 feet in width with a maximum 30-foot wide surface disturbance area. All access roads would be maintained in a good or better condition than those existing at commencement of operations.

Well Pad:

300’ x 300’ well pad, located within a 600’ x 600’ archeological surveyed area, will be constructed. There will be no reserve pit as the proponent has proposed using the closed-loop drilling system. Standard oilfield construction equipment consisting of; track-type tractors, motor graders, dump trucks, and water trucks would be used to construct the access road and well pad. A rotary drilling rig would be used to drill the well to a total measured depth (MD) of 5150 feet. Associated production facilities (e.g., pipeline, separator, storage tanks, etc.) would be installed during the production phase of this well.

Proposed Well Location Information:

Federal 27 #6
1600’ FNL & 1710 FWL, Unit F, Sec. 27 T7S-R37E
Roosevelt County, New Mexico NMPM
Mineral Lease # NM-54449

Applicant:

H.L. Brown Operating, LLC.
PO Box 2237
Midland, Texas 79702

Surface Owners:

Mack Kizer,
Pep, New Mexico

2.3 Alternative C – Preferred Alternative

Alternatives to the proposed action (Alternative B) were identified as the result of the onsite inspection conducted on August 7, 2008. Changes were made as described below to mitigate environmental impacts in accordance to the management prescription of the 1997 Roswell RMP, as amended. In all other respects, this alternative is the same as Alternative B.

Changes as a result of the on-sites:

- 3" steel subsurface gas production line on south side of road will need to be avoided
- Original proposed pad is 225' x 275' with a 250' x 100' reserve pit, however operator chose to use a closed-loop drilling system at the time of the APD an pad is 300’ x 300’ with no reserve pit
- Original proposal indicated soil would have be stockpiled on East side of pad, however it was recommended to stockpile the soil on the west of the pad and APD indicates such
- interim reclamation and the need to condense the pad within 6 months of completion
- This is within 1.5 miles of 3 Lesser-Prairie Chicken (LPC) leks, documented by New Mexico Department of Game and Fish (NMDGF). It is also adjacent to 1 NMDGF LPC Area. Operator will be subject to timing stipulations SENM-S-22.
- We also discussed the new Standard Environmental Color Juniper Green and mailed the operator the new color chart

2.4 Alternatives Considered But Not Analyzed In Detail

Relocate the Proposed Action:

The well location is determined on the basis of subsurface geologic information. No other alternative location would have significantly fewer impacts than, or have a clear advantage over, the projected location. Therefore, the alternative of changing the location involved in this action is not analyzed further in this EA.

3.0 Description of Affected Environment

This section describes the environment that would be affected by implementation of the alternatives described in Section 2. Aspects of the affected environment described in this section focus on the relevant major resources or issues. Certain critical environmental components require analysis under BLM policy. These items are included below in Table 3.0, found as the first page of this document. Following the table, only the aspects of the affected environment that are potentially impacted are described. The following elements are not present: Areas of Critical Environmental Concern, Prime or Unique Farmlands, Floodplains, Wild and Scenic Rivers, Wilderness or Wilderness Study Areas, Paleontology, Native American Religious Concerns, Wastes, Hazardous or Solids, and Wild Horses and Burros.

The proposed well is located in Roosevelt County, New Mexico and described in the 1997 Roswell RMP Record of Decision. The proposed well and the associated infrastructure fall within the reasonable foreseeable development scenario. Additional general information on

air quality in these areas is contained in Chapter 3 of the Roswell Draft RMP/Environmental Impact Statement.

In addition to the air quality information in the RMPs cited above, new information about Greenhouse gases (GHGs) and their effects on national and global climate conditions has emerged since the RMPs were prepared. On-going scientific research has identified the potential impacts of GHG emissions such as carbon dioxide (CO_2) methane (CH_4); nitrous oxide (NO); water vapor; and several trace gasses on global climate. Through complex interactions on a global scale, GHG emissions 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.

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

3.1 Air Resources

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. 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. GHG's and the potential effects of GHG emissions on climate are not regulated by the EPA, however climate has the potential to influence renewable and non-renewable resource management.

3.1.1 Air Quality

The area of the proposed action is considered a Class II air quality area. A Class II area allows moderate amounts 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 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.

Greenhouse gases, including carbon dioxide (CO2) and methane (CH4), and the potential effects of GHG emissions on climate, are not regulated by the EPA under the Clean Air Act. However,

climate has the potential to influence renewable and non-renewable resource management. The EPA's Inventory of US Greenhouse Gas Emissions and Sinks found that in 2006, total US GHG emissions were over 6 billion metric tons and that total US GHG emissions have increased by 14.1% from 1990 to 2006. The report also noted that GHG emissions fell by 1.5% from 2005 to 2006. This decrease was, in part, attributed to the increased use of natural gas and other alternatives to burning coal in electric power generation.

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

3.1.2 Climate

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

In 2001, the Intergovernmental Panel on Climate Change (IPCC) predicted that by the year 2100, global average surface temperatures would increase 1.4 to 5.8°C (2.5 to 10.4°F) above 1990 levels. 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 is 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 lease parcels and subsequent actions.

In New Mexico, a recent study indicated that the mean annual temperatures have exceeded the global averages by nearly 50% since the 1970's (Enquist and Gori). 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% of the geographical area of New Mexico. Warming is greatest in the northwestern, central, and southwestern parts of the state.

3.2 Cultural Resources

The project falls within the Southeastern New Mexico Archaeological Region. This region contains the following cultural/temporal periods: Paleoindian (ca. 12,000-8,000 B.C.), Archaic (ca. 8000 B.C. –A.D. 950), Ceramic (ca. A.D. 600-1540) Protohistoric and Spanish Colonial (ca. A.D. 1400-1821), and Mexican and American Historical (ca. A.D. 1822 to early 20th century). Sites representing any or all of these periods are known to occur within the region. A more complete discussion can be found in *Living on the Land: 11,000 Years of Human Adaptation in Southeastern New Mexico An Overview of Cultural Resources in the Roswell District, Bureau of Land Management* published in 1989 by the U.S. Department of the Interior, Bureau of Land Management. A cultural resource inventory shall be conducted of the area of effect for the proposed project prior to any ground disturbing activities.

3.3 Environmental Justice

Executive Order 12898 requires Federal agencies to assess projects to ensure there is no disproportionately high or adverse environmental, health, or safety impacts on minority and low-income populations.

3.4 Invasive, Non-native Weed Species

There are no known populations of invasive or noxious weed species on the proposed access road and well pad.

Infestations of noxious weeds can have a disastrous impact on biodiversity and natural ecosystems. Noxious weeds affect native plant species by out-competing native vegetation for light, water and soil nutrients. Noxious weeds cause estimated losses to producers $2 to $3 billion annually. These losses are attributed to: (1) Decreased quality of agricultural products due to high levels of competition from noxious weeds; (2) decreased quantity of agricultural products due to noxious weed infestations; and (3) costs to control and/or prevent the noxious weeds.

Further, noxious weeds can negatively affect livestock and dairy producers by making forage either unpalatable or toxic to livestock, thus decreasing livestock productivity and potentially increasing producers' feed and animal health care costs. Increased costs to operators are eventually borne by consumers.

Noxious weeds also affect recreational uses, and reduce realty values of both the directly influenced and adjacent properties.

Recent federal legislation has been enacted requiring state and county agencies to implement noxious weed control programs. Monies would be made available for these activities from the federal government, generated from the federal tax base. Therefore, all citizens and taxpayers of the United States are directly affected when noxious weed control prevention is not exercised.

3.5 Wildlife

The vegetation found at this site provides habitat to a large range of wildlife species. Some of the common mammals are mule deer, pronghorn, badger, coyote, fox, jackrabbit, cottontail, kangaroo rat, and pocket gopher. It also provides habitat for a variety of grassland and desert birds. Important passerine birds include meadowlark, horned lark, lark bunting, Cassin's sparrow, lark sparrow, Chihuahuan raven, and loggerhead shrike. Other birds include scaled quail, mourning dove, roadrunner, common nighthawk, killdeer, and a variety of raptors including red-tailed and Swainson's hawk, northern harrier, great horned owl, and burrowing owl. It also provides habitat to a large variety of common lizards and snakes.

3.6 Special Status Species

In accordance with BLM Manual 6840, BLM manages certain sensitive species not federally listed as threatened or endangered in order to prevent or reduce the need to list them as threatened or endangered in the future. Included in this category are State listed endangered species and Federal candidate species which receive no special protections under the Endangered Species Act. Special status species with potential to occur in the proposed project area are listed in Table below.

Lesser Prairie Chicken (*Tympanuchus pallidicinctus*)	**Federal candidate**	**Shinnery oak - dune**	**S**
Sand Dune Lizard (*Sceloporus arenicolus*)	**Federal candidate**	**Blowouts in shinnery oak - dune**	**NP**

S Habitat suitable and species suspected to occur within the project area.
NP Habitat not present and species unlikely to occur within the project area.

The site falls within Lesser prairie chicken primary population area and occupied habitat within the RMPA planning area based on several booming grounds identified by the NM Department of Game and Fish during the RMPA planning process. There are several booming grounds in the immediate vicinity of the proposed well.

3.7 Water Quality

Surface:

Surface water within the area is affected by geology, precipitation, and water erosion. Factors that currently affect surface water resources include livestock grazing management, oil and gas development, recreational use and brush control treatments. No perennial surface water is found on public land in the area. Ephemeral surface water within the area may be located in tributaries, playas, alkali lakes and stock tanks.

Ground:

Groundwater within the area is affected by geology and precipitation. Factors that currently affect groundwater resources in the area include oil and gas development, groundwater pumping, and possible impacts from brush control treatments. Most of the groundwater in the area is used for industrial, rural, domestic and livestock purposes.

Usable water sources for stock and domestic use are found in unconsolidated sand and gravel deposits of Cretaceous age which occur primarily in erosion channels cut into the underlying Triassic-age red beds. The aquifer has a saturated thickness in excess of 100 feet in the deepest parts of the channels. The Ogallala may also be a source of small amounts of water in portions of the area. The deepest useable water encountered is found at a depth of 455 ft. in water well used for stock purposes and located in the SW¼SE¼, sec. 5, T. 8 S., R. 37 E., NMPM. This deeper aquifer appears to be sourced in the Chinle Fm. according to the following geologic markers:

Geologic Marker	Depth
Chinle	
Santa Rosa	520’ (?)
Dewey Lake	1335’ (?)
Rustler Anhy	2263’
Salado	2650’

Marker beds taken directly from the well log of the Federal A No. 1 located in the NE1/4NW1/4, sec. 27, T. 7 S., R. 37 E., NMPM.

3.8 General Topography/Surface Geology

The surface disturbance anticipated from the construction of the well pad and access road would have minimal impacts on the area of the operations. No major land or soil displacement would occur from the cradle to grave operations associated with construction of the access road and well pad.

3.9 Mineral Resources

Construction material (caliche/gravel) for surfacing the access road and well pad could be obtained by the operator from a private surface/federal minerals pit located in the NE¼ of Section 27, T. 07 S., R. 37 E., Roosevelt County, New Mexico. The material could also be obtained from nearby unreclaimed plugged and abandoned wells.

3.10 Soil

The Soil Survey of Roosevelt County, New Mexico, (USDA Soil Conservation Service 1967) was used to describe and analyze impacts to soil from the proposed action. The soil map units represented in the project area are:

Brownfield fine sand, 0 to 3 percent slopes (Be) Runoff of the unit soil is slight, and internal drainage is good, and the hazard of wind erosion is severe.

3.11 Watershed – Hydrology

The watershed and hydrology in the area is affected by land and water use practices. The degree to which hydrologic processes are affected by land and water use depends on the location, extent, timing and the type of activity. Factors that currently cause short-lived alterations to the hydrologic regime in the area include livestock grazing management, recreational use activities, groundwater pumping and also oil and gas developments such as well pads, permanent roads, temporary roads, pipelines and powerlines.

3.12 Vegetation:

This lease is within the Shinnery-Oak Dune Plant Community as identified in the Roswell Resource Management Plan/Environmental Impact Statement (RMP/EIS). Appendix 11 of the Draft RMP/EIS describes the Desired Plant Community (DPC) concept and identifies the components of each community. The primary features in the shinnery oak dune (SOD) community are topography influenced by aeolian and alluvial sedimentation on upland plains forming hummocks, dunes, sand ridges and swales and the presence of shinnery oak *(Quercus havardii).* The topography is gently sloping and undulating sandy plains, with moderate to very steep hummocky dunes of up to ten feet and more in height scattered throughout the area. Some of the dunes are stabilized with vegetation, while a number of them are unstable and shifting. Dune blowouts with shinnery oak and bluestem, either isolated or in dune complexes are common in this community. Dominant grasses include sand bluestem *(Andropogon hallii),* little bluestem *(Schizachiyrium scoparium),* and three-awn *(Aristida* spp.).

The Ecological Site Description for the well pad and access road is HP-3 Sandy Plains (Southern High Plains).

3.13 Livestock Grazing/Range

This proposed action is located outside the grazing district boundary and there is no BLM grazing allotment associated.

3.14 Visual Resources

Visual Resource Management (VRM) on public land is conducted in accordance with BLM Handbook 8410 and BLM Manual 8411.

3.15 Recreation

The area around the proposed action site is primarily used by recreational visitors engaged in hunting, caving, sight-seeing, driving for pleasure, off-highway vehicle use, and other recreational activities. Non-recreation visitors include oil and gas industrial workers and ranchers.

3.16 Cave/Karst

While the proposed action is located in the *Low Potential Karst Area*, no surface cave/karst features were observed in the immediate vicinity of the proposed actions.

3.17 Public Health and Safety

The project will not be detrimental to the public health. The operator will insure that all phases of the project operations are conducted in workman like manner. Precautionary procedures and/or measures will be strictly adhered to in order provide a safe and sound working environment for the life of the well.

4.0 Environmental Consequences and Proposed Mitigation Measures

Alternative A – No Action

Under the No Action Alternative, the proposed wells would not be drilled. There would be no new impacts from oil and gas production to the resources. The No Action Alternative would result in the continuation of the current land and resource uses in the project area and is used as the baseline for comparison of alternatives.

Alternative B – Proposed Action

Under Alternative B, the Proposed Action, the wells would be drilled as originally proposed, without changes to reduce the potential impact to the environment. This includes a 300’ x 300’ well pad on private surface. There will be no new access road. The total surface disturbance will aggregate approximately 2.0 acres. Descriptions of potential impacts on individual resources for action alternatives is presented in the following text. Also described are mitigation measures that could be incorporated by the BLM where appropriate as Conditions of Approval attached to the permit.

Alternative C - Preferred Alternative

Descriptions of potential impacts on individual resources for action alternatives is presented in the following text. Also described are mitigation measures that could be incorporated by the BLM where appropriate as Conditions of Approval attached to the permit. The changes to the proposed action which resulted in development of Alternative C as the preferred alternative have reduced the potential impact to the environment which will result from this action

4.1 Air Resources

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 access road, well pad, and by the drilling rig that will be used to drill the well. Dust dissemination would discontinue upon completion of the construction phase of the access road and well pad. Air pollution from the motorized equipment would discontinue at the completion of the drilling phase of the operations. The winds that frequent the southeastern 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.

The federal Clean Air Act requires that air pollutant emissions be controlled from all significant sources in areas that do not meet the national ambient Air quality standards. The New Mexico Air Quality Bureau (NMAQB) is responsible for enforcing the state and national ambient air quality standards in New Mexico. Any emission source must comply with the NMAQB regulations (USDI, BLM 2003b). At the present time, the counties that lie within the jurisdictional boundaries of the Roswell Field Office are classified as in attainment of all state and national ambient air quality standards as defined in the Clean Air Act of 1972, as amended (USDI, BLM 2003b).

The Environmental Protection Agency (EPA), on October 17, 2006, issued a final ruling on the lowering of the National Ambient Air Quality Standard (NAAQS) for particulate matter ranging from 2.5 micron or smaller particle size. This ruling became effective on December 18, 2006, stating that the 24-hour standard for PM2.5, was lowered to 35 ug/m^3 from the previous standard of 65 ug/m^3. This revised PM2.5 daily NAAQS was promulgated to better protect the public from short-term particle exposure. The significant threshold of 35 ug/m^3 daily PM2.5 NAAQS is not expected to be exceeded under the proposed action.

Over the last 10 years, the leasing of Federal oil and gas mineral estate in Roswell Field Office has resulted in an average total of 60 wells drilled on federal leases annually. These wells would contribute a small percentage of 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 and volatile organic compounds 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 Roswell RMP demonstrated 60 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, 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 lease tracts would not have a measurable effect on climate change due to uncertainty and incomplete and unavailable information.

Consumption of oil and gas developed from the proposed well is expected to produce GHGs. 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.

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 EPA's inventory data breaks down the total US sources of GHG gases by major categories that include "Natural Gas Systems" and "Petroleum Systems." The inventory lists the contributions of natural gas and petroleum systems to total CO2 and CH4 emissions (natural gas and petroleum systems do not produce significant amounts of any of the other greenhouse gases). For Natural Gas Systems, the EPA categorizes emissions from distinct stages of the larger category of natural gas systems. These stages include field production, processing, transmission and storage, and distribution. The BLM has regulatory jurisdiction only over field production. Petroleum Systems sub-activities include production field operations, crude oil transportation, and crude oil refining. Within the petroleum systems emission categories, the BLM has authority to regulate production field operations.

The BLM's regulatory jurisdiction over field production of Natural Gas Systems and production field operations of Petroleum Systems 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. The future development of the lease parcels may be subject to appropriate conditions of approval (COAs) to reduce or mitigate GHG emissions. This may occur at the project level through additional analysis. Specific measures developed at the project stage would be incorporated as COAs in the approved APD, and are binding on the operator.

Typical measures may include: flare hydrocarbon and gases at high temperatures in order to reduce emissions of incomplete combustion; water dirt roads during periods of high use in order to reduce fugitive dust emissions; require that vapor recovery systems be maintained and functional in areas where petroleum liquids are stored; and revegetate areas of the pad not required for production facilities to reduce the amount of dust from the pads.

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 Best Management Practices proposed by the EPA's Natural Gas Energy Star program. The Roswell Field Office will work with industry to facilitate the use of the relevant BMPs for operations proposed on federal mineral leases where such mitigation is consistent with agency policy.

4.2 Cultural Resources

4. 2.1 Direct and Indirect Impacts

A cultural resource inventory was conducted for the area of effect (08-R-090-A), no Historic Properties were identified. No cultural resources will be affected.

4.2.2 Mitigation

Any cultural and/or paleontological resource discovered by the operator or by any person working on the operator's behalf shall immediately report such findings to the Authorized Officer. The operator is fully accountable for the actions of their contractors and subcontractors. The operator shall suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the Authorized Officer. An evaluation of the discovery shall be made by the Authorized Officer to determine the appropriate actions that shall be required to prevent the loss of significant cultural or scientific values of the discovery. The operator shall be held responsible for the cost of the proper mitigation measures that the Authorized Officer assesses after consultation with the operator on the evaluation and decisions of the discovery. Any unauthorized collection or disturbance of cultural or paleontological resources may result in a shutdown order by the Authorized Officer.

4.3 Environmental Justice

No minority or low income populations would be directly affected in the vicinity of the proposed action. Indirect impacts could include impacts due to overall employment opportunities related to the oil and gas and service support industry in the region, as well as the economic benefits to State and County governments related to royalty payments and severance taxes. Other impacts could include a small increase in activity where vehicular traffic increases in areas used for grazing or hunting. However, these impacts would apply to all public land users in the project area.

4.4 Invasive, Non-native Weed Species

4.4.1 Direct and Indirect Impacts

The construction of an access road and well pad may unintentionally contribute to the establishment and spread of noxious weeds. Noxious weed seed could be carried to and from the project areas by construction equipment, the drilling rig and transport vehicles. The main mechanism for seed dispersion on the road and well pad is by equipment and vehicles that were previously used and or driven across or through noxious weed infested areas. The potential for the dissemination of invasive and noxious weed seed may be elevated by the use of construction equipment typically contracted out to companies that may be from other geographic areas in the region. Washing and decontaminating the equipment prior to transporting onto and exiting the construction areas would minimize this impact.

Impacts by noxious weeds will be minimized due to requirements for the company to eradicate the weeds upon discovery. Multiple applications may be required to effectively control the identified populations.

4.4.2 Mitigation

In the event noxious weeds are discovered during construction of the access road and well pad, measures will be taken to mitigate those impacts.

4.5 Wildlife

4.5.1 Direct and Indirect Impacts

Some small wildlife species may be killed and their dens or nests destroyed during construction of the access road and well pad. The construction of the access road and well pad could cause fragmentation of wildlife habitat. The short-term negative impact to wildlife would occur during the construction phase of the operations would be due to noise and habitat destruction. In general, most wildlife species would become habituated to the new facilities. For other wildlife species with a low tolerance to activities, the operations on the well pad would continue to displace wildlife from the area due to disturbances by the high volumes of vehicle traffic during equipment maintenance. Upon abandonment of the well, the area would revegetate and wildlife would return to previous levels.

4.5.2 Mitigation

The conditions of approval would alleviate most losses of wildlife species, such as; netting storage tanks, installation or other modifications of cones on separator stacks, and timing stipulations.

4.6 Special Status Species

4.6.1 Direct and Indirect Impacts

Direct and Indirect Impacts Special Status Species – lesser prairie chicken. Impacts to habitat will occur by the continued fragmentation caused by the construction of the well pad, roads, pipelines, and the increased presence of human traffic. Noise and disturbance during the breeding season could disrupt their reproduction. Permanent monuments can be used as perches for predatory raptors.

4.6.2 Mitigation

Timing of work and limiting of noise levels to minimize disturbance impacts are regulated by stipulations as shown in Exhibit C. Habitat will be restored as per the reclamation/restoration requirements. Upon abandonment the permanent monument will be cut at or below ground level.

4.7 Water Quality:

Surface:

4.7.1A Direct and Indirect Impacts

Surface disturbance from the construction of the well pad, closed system or steel tanks, access road, pipelines, and powerlines can result in degradation of surface water quality and groundwater quality from non-point source pollution, increased soil losses, and increased gully erosion.

Potential direct impacts that would occur due to these surface disturbing activities include increased surface water runoff and off-site sedimentation brought about by soil disturbance: increased salt loading and water quality impairment of surface waters; channel morphology changes due to road and pipeline crossings; and possible contamination of surface waters by produced water. The magnitude of these impacts to water resources would depend on the proximity of the disturbance to the drainage channel, slope aspect and gradient, degree and area of soil disturbance, soil character, duration and time within which construction activity would occur, and the timely implementation and success or failure of mitigation measures.

Direct impacts would likely be greatest shortly after the start of construction activities and would likely decrease in time due to natural stabilization, and reclamation efforts. Construction activities would occur over a relatively short period; therefore, the majority of the disturbance would be intense but short lived. Direct impacts to surface water quality would be minor, short-term impacts which may occur during storm flow events. Indirect impacts to water-quality related resources, such as fisheries, would not occur.

Petroleum products and other chemicals, accidentally spilled, could result in surface and groundwater contamination. Similarly, possible leaks from closed systems or steel tanks could

degrade surface and ground water quality. Authorization of the proposed projects would require full compliance with BLM directives and stipulations that relate to surface and groundwater protection.

4.7.2A Mitigation

The use of a closed system or steel tanks would reduce or eliminate the seepage of drilling fluid into the soil and groundwater. Spills of produced fluids (e.g., saltwater, oil, and/or condensate in the event of a breech, overflow, or spill from storage tanks) could result in contamination of the soil onsite, or offsite, and may potentially impact surface and groundwater resources in the long term.

Groundwater:

4.7.1B Direct and Indirect Impacts

Spills or produced fluids (e.g., saltwater, oil, and/or condensate in the event of a breech, overflow, or spill from storage tanks) could result in contamination of the soil onsite, or offsite, and may potentially impact surface and groundwater resources in the long term. Petroleum products and other chemicals, accidentally leaked through casing, could result in surface and groundwater contamination. Similarly, possible leaks from closed systems or steel tanks could degrade ground water quality.

4.7.2B Mitigation

The use of a closed system or steel tanks would reduce or eliminate seepage of drilling fluid into the soil and groundwater

The drilling mud program, water protection casing string(s) and cementing requirements imposed on the proposed well would reduce or eliminate the potential for groundwater contamination.

4.8 General Topography/Surface Geology

The surface disturbance anticipated from the construction of the well pad and access road would have minimal impacts on the area of the operations. No major land or soil displacement would occur from the cradle to grave operations associated with drilling the well.

4.8.1 Direct and Indirect Impacts

Direct impacts would result from the removal of the surface soils during construction of the well pad and access road. The consequential earth moving activities would indirectly impact the vegetation and would cause the fragmentation of the surface habitat where small animals live in the project area.

4.8.2 Mitigation

The inclusion of mitigation measures to conserve the landscape as much as possible in the Conditions of Approval would lessen the impacts from the surface disturbance activities on this project.

4.9 Soil

4.9.1 Direct and Indirect Impacts

The construction of the access road, well pad, and the use of the closed system or steel tanks would physically disturb the topsoil and would expose the substratum soil. (See -Table 1.0 for Summary of Disturbance).

Direct impacts resulting from these surface disturbing activities include removal of vegetation, exposure of the soil, mixing of horizons, compaction, loss of top soil productivity and susceptibility to wind and water erosion. Wind erosion would be expected to be a minor contributor to soil erosion with the possible exception of dust from vehicle traffic. These impacts could result in increased indirect impacts such as runoff, erosion and off-site sedimentation. Activities that could cause these types of indirect impacts include construction and operation of well site, access road, gas pipelines and production facilities.

Contamination of soil from drilling and production wastes mixed into soil or spilled on the soil surfaces could cause a long-term reduction in site productivity. Some of these direct impacts can be reduced or avoided through proper design, construction and maintenance and implementation of best management practices.

Additional soil impacts associated with lease development would occur when heavy precipitation causes water erosion damage. When water saturated segment(s) on the access road become impassable, vehicles may still be driven over the road. Consequently, deep tire ruts would develop. Where impassable segments are created from deep rutting, unauthorized driving may occur outside the designated route of the access road.

4.9.2 Mitigation

The topsoil will be stripped to approximately 6 inches in depth within the area designated for construction of the well pad. The operator shall stockpile the stripped topsoil on the side of the well pad. The topsoil will be used for interim and final reclamation of the surface disturbance created by the construction of the well pad. The direct and indirect impacts to soil resulting from the surface disturbing activities will be mitigated through the instructions and/or orders for surface reclamation/restoration of the disturbed areas.

Upon abandonment of the well and/or when the access road is no longer in service the Authorized Officer shall issue instructions and/or orders for surface reclamation/restoration of the disturbed areas as described in the attached Conditions of Approval.

Road constructions requirements and regular maintenance would alleviate potential impacts to the access road from water erosion damage.

4.10 Watershed - Hydrology

4.10.1 Direct and Indirect Impacts

Construction and surface disturbance activities from the construction of the well pad, access road, pipelines and powerlines can result in long term and short term alterations to the hydrologic regime. Peak and low flow of perennial streams, ephemeral, and intermittent rivers and streams would be directly affected by an increase in impervious surfaces resulting from the construction of the well pad and road. The potential hydrologic effects to peak flow is reduced infiltration where surface flows can move more quickly to perennial or ephemeral rivers and streams, causing peak flow to occur earlier and be larger. Increased magnitude and volume of peak flow can cause bank erosion, channel widening, downward incision and disconnection from the floodplain. The potential hydrologic effects to low flow is reduced surface storage and groundwater recharge, resulting in reduced baseflow to perennial, ephemeral, and intermittent rivers and streams. The direct impact would be that hydrologic processes may be altered where the perennial, ephemeral, and intermittent river and stream system responds by changing physical parameters, such as channel configuration. These changes may in turn impact chemical parameters and ultimately the aquatic ecosystem.

Long term direct and indirect impacts to the watershed and hydrology would continue for the life of the well and would decrease once the surfacing material has been removed from the well pad and access road. Short term direct and indirect impacts to the watershed and hydrology would occur from access roads that are not surfaced with material and would likely decrease in time due to reclamation efforts.

4.10.2 Mitigation

The topsoil will be stripped to approximately 6 inches in depth within the area designated for construction of the well pad. The operator shall stockpile the stripped topsoil within the well pad. The topsoil will be used for interim and final reclamation of the surface disturbance created by the construction of the well pad. Upon abandonment of the well and/or when the access road is no longer in service the Authorized Officer will issue instructions and/or orders for surface reclamation/restoration of the disturbed areas as described in the attached Conditions of Approval.

4.11 Vegetation

4.11.1 Direct and Indirect Impacts

The construction of the access road and well pad would remove native vegetation. Vegetative recovery on the access road and well pad would depend on life of the well. Native vegetation would encroach on the well pad over time and where high volumes of vehicular traffic occur the areas driven over would remain unvegetated. If it is a producing well, reclamation would not

commence until the well is a depleted producer and is plugged and abandoned. If the well is drilled as a dry hole and is plugged, the reclamation of the access road and well pad would immediately follow. The impacts to the vegetation would be short-term if the reclamation efforts of the disturbed areas have re-vegetated successfully within a few years.

4.11.2 Mitigation

No impact to vegetation is anticipated. However measures will be taken in the event impacts to vegetation are found.

4.12 Livestock Grazing/Range

4.12.1 Direct and Indirect Impacts

During the construction and drilling phases of the well, there would be some minor disruption of livestock grazing in the pastures, specifically on the well pad. The increase of vehicle traffic within the project areas could lead to conflicts with livestock.

4.12.2 Mitigation: No mitigation

4.13 Visual Resources

[VRM Class IV]

Facilities, such as condensate and produced water or oil storage tanks that rise above eight feet, would provide a geometrically strong vertical and horizontal visual contrast in form and line to the characteristic landscape and vegetation, which have flat, horizontal to slightly rolling form and line. The construction of an access road, well pad and other ancillary facilities, would slightly modify the existing area visual resources. The proposed action is located in an area designated VRM Class IV.

The objective of Class IV is to: "Provide for management activities which require major modification of the existing landscape character...Every attempt, however, should be made to reduce or eliminate activity impacts through careful location, minimal disturbance, and repeating the basic landscape elements."

Through color manipulation, by painting well facilities to blend with the rolling to flat vegetative and/or landform setting with a gray-green to brownish color, the view is expected to favorably blend with the form, line, color and texture of the existing landscape. The semi-gloss color (Juniper Green) from the standard environmental colors (June 2008) also closely approximates the brownish color of the setting. All facilities, including the meter building, would be painted this color.

Cumulative adverse visual impacts can be avoided by gradually moving into a more appropriate vegetative/landform setting color scheme.

4. 13.1 Direct and Indirect Impacts

Through color manipulation, by painting well facilities to blend with the rolling to flat vegetative and/or landform setting with a gray-green to brownish color, the view is expected to favorably blend with the form, line, color and texture of the existing landscape

4.13.2 Mitigation

The color semi-gloss Juniper Green from the Standard Environmental Colors Chart (June 2008) is to be used on all facilities to closely approximates the vegetation within the setting. All facilities, including the meter building, would be painted this color.

4.14 Recreation

Oil and gas activities would have little or no affect on the recreation al opportunities in this area. Recreation activities could occur within this area and are limited to access from state or county roads or through state land.

4.15 Cave/Karst

While the proposed action is located in the *Low Potential Karst Area*, no surface cave/karst features were observed in the immediate vicinity of the proposed actions.

4.16 Public Health and Safety

The construction and drilling operations will be conducted in a safe workman like manner and no impacts are anticipated to occur when the operations are conducted in a professional constructive manner.

4.17 Cumulative Impacts

The leased area of the proposed action has been industrialized with oil and gas well development. The surface disturbance for each project that has been permitted has created a spreading out of land use fragmentation. The cumulative impacts fluctuate with the gradual reclamation of well abandonments and the creation of new additional surface disturbances in the construction of new access roads and well pads. The ongoing process of restoration of abandonments and creating new disturbances for drilling new wells gradually accumulates as the minerals are extracted from the land. Preserving as much land as possible and applying appropriate mitigation measures will alleviate the cumulative impacts.

Due to the absence of regulatory requirements to measure GHG emissions and the variability of oil and gas activities on federal minerals, it is not possible to accurately quantify potential GHG emissions in the affected areas as a result of making the proposed tracts available for leasing. Some general assumptions however can be made: leasing the proposed tracts may contribute to drilling new wells.

The New Mexico Greenhouse Gas Inventory and Reference Case Projection 1990-2020 (Inventory) estimates that approximately 17.3 million metric tons of natural gas and 2.3 million metric tons of natural gas emissions are projected by 2010 as a result of oil and natural gas production, processing, transmission and distribution. As of 2008, there were 23,196 oil wells and 27, 778 gas wells in New Mexico.

There are approximately 4,500 existing oil and gas wells in the Roswell Field Office, which account for approximately 9 percent of the total wells in New Mexico. Therefore, GHG emissions from all wells within the field office amount to approximately 1.764 metric tons annually (19,6 mmt X 0.09 = 1.764 mmt). Federal oil and gas wells amount to approximately 40 percent of the wells within the field office (see Appendix 7 of the 2006 Draft Special Status Species RMP Amendment.). Annual GHG emissions from federal oil and gas wells are approximately 0.71 metric tons (1.763 mmt X 0.4 = 0.71 mmt).

These totals, when compared to the estimates used for the cumulative analysis previously referenced, show that wells drilled on federal leases wells may be expected to produce approximately 3.6 percent of the GHG emissions produced from wells drilled in New Mexico. This amount of GHG emissions represents an incremental contribution to the total emissions and is also insignificant when compared to global GHG emission levels. This incremental contribution to global GHG gases cannot be translated into incremental effects on climate change globally or in the area of these site-specific actions. As oil and gas and natural gas production technology continues to improve in the future, one assumption is that it may be feasible to further reduce 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.

While it is likely that there will be no significant cumulative impact from the proposed actions, continued oil and gas development, and other surface-disturbing activities in these areas, may potentially have negative cumulative impacts on vegetation, soil, water, livestock, wildlife and visual resources.

4.17.1 Residual Impacts

Direct impacts to the local environment detailed above remain throughout the life of the proposed operation; however, these impacts would be substantially reduced by mitigation measures.

4.17.2 Mitigation Measures

Mitigation measures have been identified and have been incorporated into conditions of approval and/or stipulations and are made part of the permit. These measures include but are not limited to dust control, noxious weed control, road construction, maintenance, and termination.

5.0 Consultation/Coordination

This section includes individuals or organizations from the public and its' users, the interdisciplinary team, and permittees that were contacted during the development of this document.

Table 5.0 Summary of Public Contacts Made During Preparation of Document and Interdisciplinary Team Present at Onsite.

Public Contact	Title	Organization	Present at Onsite?
Lonnie Reddell	Field Supervisor	HL Brown Op., LLC	Present
ID Team Member	Title	Organization	Present at Onsite?
Richard G. Hill	Environmental Protection Specialist	RFO	Present
Brian Novosak	Natural Resource Spec.	RFO	

6.0 Appendices

The Roswell Field Office; (Exhibit A) – General Location Map, (Exhibit B) - Pecos District-RFO, Conditions of Approval, and the special requirements derived from this EA, would be applied to this proposed action to minimize the surface disturbance and conserve the surrounding landscape.

6.1.0 References

EPA Inventory of US Greenhouse Gas Emissions and Sinks: 1990-2006. Environmental Protection Agency, Washington, D.C.

EPA, Natural Gas Star Program (2006 data) at: http://www.epa.gov/gasstar/accomplish.htm. Environmental Protection Agency, Washington, D.C.

Enquist, Carolyn and Gori, Dave. Implications of Recent Climate Change on Conservation Priorities in New Mexico. April 2008.

Goddard Institute for Space Studies. 2007. Annual Mean Temperature Change for Three Latitude Bands. Datasets and Images. GISS Surface Temperature Analysis, Analysis Graphs and Plots. New York, New York. (Available on the Internet: http://data.giss.nasa.gov/gistemp/graphs/Fig.B.lrg.gif.)

Intergovernmental Panel on Climate Change (IPCC). 2007. Climate Change 2007: The Physical Basis (Summary for Policymakers). Cambridge University Press. Cambridge, England and New York, New York. (Available on the Internet: http://www.ipcc.ch/pdf/assessment-report/ar4/wg1/ar4-wg1-spm.pdf)

Intergovernmental Panel on Climate Change (IPCC). Climate Change 2007, Synthesis Report. A Report of the Intergovernmental Panel on Climate Change.

National Academy of Sciences. 2006. Understanding and Responding to Climate Change: Highlights of National Academies Reports. Division on Earth and Life Studies. National Academy of Sciences. Washington, D.C. (Available on the Internet: http://dels.nas.edu/basc/Climate-HIGH.pdf.)

US Government Accountability Office Report "Climate Change, Agencies Should Develop Guidance for Addressing the Effects on Federal Land and Water Resources" GAO-07-863, August 2007 (1st paragraph, 1st page, GAO Highlights) at: http://www.gao.gov/news.items/d07863.pdf.

U.S. Department of the Interior, Bureau of Land Management. 1997. Roswell Proposed Resource Management Plan and Final Environmental Impact Statement. Roswell, New Mexico.

U.S. Department of the Interior, Bureau of Land Management. 1997. Roswell Approved Resource Management and Plan Record of Decision. Roswell, New Mexico.

U.S. Department of the Interior, Bureau of Land Management. 2008. Special Status Species Resource Management Plan Amendment and Record of Decision. Roswell, New Mexico.

6.2.1 APD

6.2.2 Authorities

Code of Federal Regulations (CFR) 3160 and 2800

40 CFR All Parts and Sections inclusive Protection of Environment, Revised as of July 1, 2001.

43 CFR, All Parts and Sections inclusive - Public Lands: Interior. Revised as of October 1, 2000.

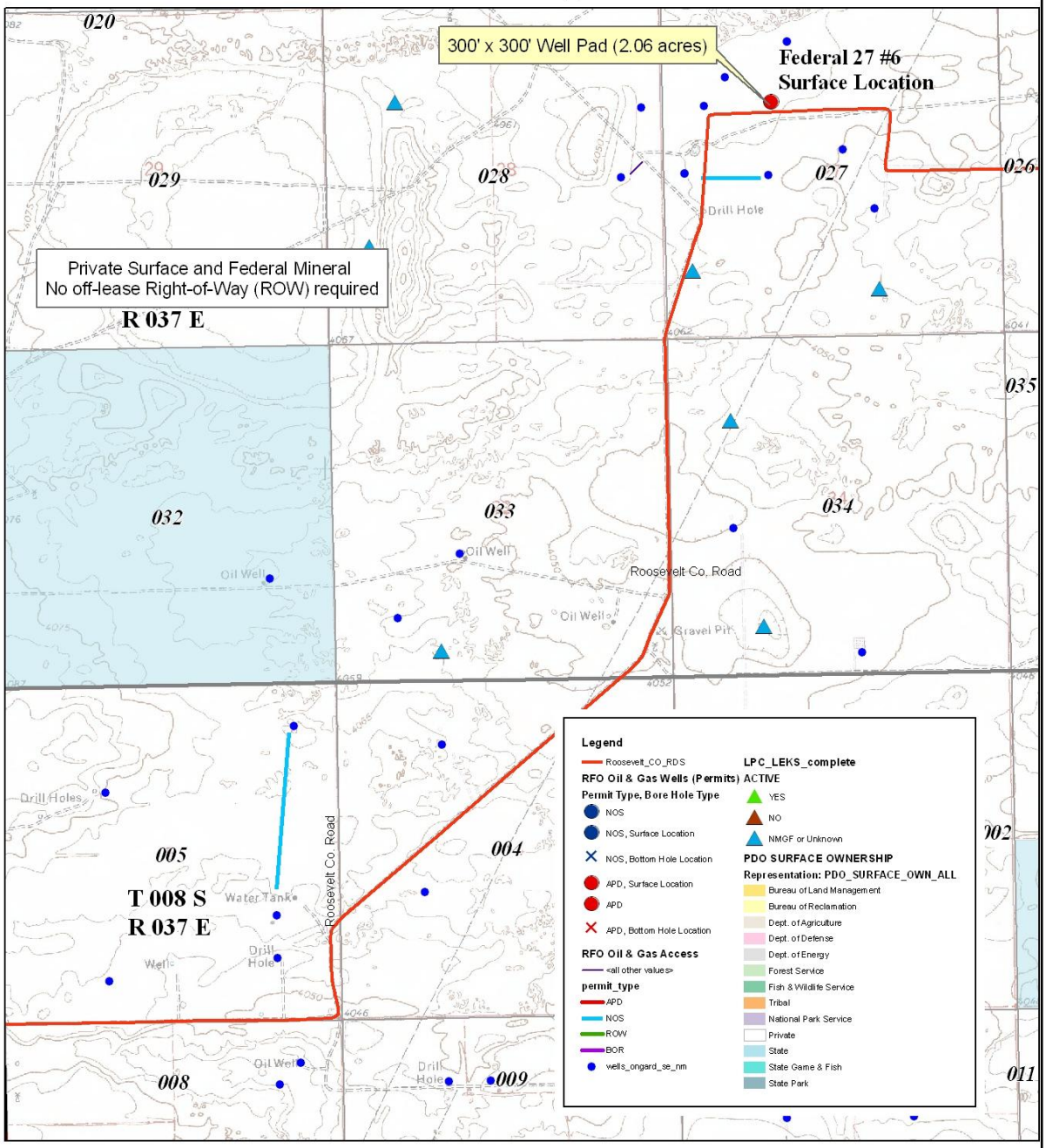
U.S. Department of the Interior, Bureau of Land Management and Office of the Solicitor (editors). 2001. The Federal Land Policy and Management Act, as amended. Public Law 94-579.

Mineral Leasing Act of 1920, as amended (30 U.S.C. 181 et seq.)

6.2.3 Other Supporting Information

EXHIBIT A
GENERAL LOCATION MAP

HL Brown Operating, LLC
Federal 27 #6 Oil Well
F-27-07S-37E
Roosevelt County, NM



No warranty is made by the Bureau of Land Management as to the' accuracy, reliability, or completeness of these data for individual use or aggregate use with other data. Original data was compiled from various sources. Spatial information may not meet National Map Accuracy Standards. This information may be updated without notification.

0 0.125 0.25 0.5 0.75 1 Miles

EXHIBIT B
PECOS DISTRICT - RFO
CONDITIONS OF APPROVAL

December 24, 2008

Federal 27 #6
1600' FNL & 1710' FWL, Unit F, Sec. 27 T7S R37E
Roosevelt County, New Mexico NMPM
Mineral Lease # NM-54449
H.L. Brown Operating, LLC

GENERAL PROVISIONS

The approval of the Application For Permit To Drill (APD) is in compliance with all applicable laws and regulations: 43 Code of Federal Regulations 3160, the lease terms, Onshore Oil and Gas Orders, Notices To Lessees, New Mexico Oil Conservation Division (NMOCD) Rules, National Historical Preservation Act As Amended, and instructions and orders of the Authorized Officer. Any request for a variance shall be submitted to the Authorized Officer on Form 3160-5, Sundry Notices and Report on Wells.

I. PERMIT EXPIRATION

If the permit terminates prior to drilling, and drilling cannot be commenced within 60 days after expiration, an operator is required to submit Form 3160-5, Sundry Notices and Reports on Wells, requesting surface reclamation requirements for any surface disturbance. However, if the operator will be able to initiate drilling within 60 days after the expiration of the permit, the operator must have set the conductor pipe in order to allow for an extension of 60 days beyond the expiration date of the APD (Filing of a Sundry Notice is required for this 60 day extension).

II. ARCHAEOLOGICAL, PALEONTOLOGY & HISTORICAL SITES

Any cultural and/or paleontological resource discovered by the operator or by any person working on the operator's behalf shall immediately report such findings to the Authorized Officer. The operator is fully accountable for the actions of their contractors and subcontractors. The operator shall suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the Authorized Officer. An evaluation of the discovery shall be made by the Authorized Officer to determine the appropriate actions that shall be required to prevent the loss of significant cultural or scientific values of the discovery. The operator shall be held responsible for the cost of the proper mitigation measures that the Authorized Officer assesses after consultation with the operator on the evaluation and decisions of the discovery. Any unauthorized collection or disturbance of cultural or paleontological resources may result in a shutdown order by the Authorized Officer.

III. NOXIOUS WEEDS

The operator shall be held responsible if noxious weeds become established within the areas of operations (access road and/or well pad). Weed control shall be required on the disturbed land where noxious weeds exist, which includes the roads, pads, associated pipeline corridor, and adjacent land affected by the establishment of weeds due to this action. The operator shall consult with the Authorized Officer for acceptable weed control methods, which include following EPA and BLM requirements and policies.

IV. CONSTRUCTION

A. NOTIFICATION:

The BLM shall administer compliance and monitor construction of the access road and well pad. Notify the Roswell Field Office at (505) 627-0247 at least 3 working days prior to commencing construction of the access road and/or well pad.

When construction operations are being conducted on this well, the operator shall have the approved Application for Permit to Drill and Conditions of Approval on the well site and they shall be made available upon request by the Authorized Officer.

B. TOPSOIL:

The topsoil will be stripped to approximately 6 inches in depth within the area designated for construction of the well pad. The operator shall stockpile the stripped topsoil to the side on the well pad. The topsoil will be used for interim and final reclamation of the surface disturbance created by the construction of the well pad.

C. CLOSED SYSTEMS OR STEEL TANKS:

A closed system or steel tanks will be used in lieu of reserve pits. No reserve pits will be allowed. The operator shall properly dispose of drilling contents at an authorized disposal site.

D. FEDERAL MINERAL MATERIALS PIT:

If the operator elects to surface the access road and/or well pad, using federal mineral materials, payment shall be made to the BLM prior to removal. Call the Roswell Field Office at (505) 627-0236.

E. WELL PAD SURFACING:

Surfacing of the well pad is not required.

If the operator elects to surface the well pad, the surfacing material may be required to be removed at the time of reclamation.

The well pad shall be constructed in a manner which creates the smallest possible surface disturbance, consistent with safety and operational need.

F. ON-LEASE ACCESS ROADS:

Road Egress and Ingress

The on-lease access road shall be constructed to access the corner of the well pad.

Road Width

The access road shall have a driving surface that creates the smallest possible surface disturbance and does not exceed fourteen (14) feet in width. The maximum width of surface disturbance, when constructing the access road, shall not exceed thirty (30) feet.

Surfacing

Surfacing material is not required on the new access road driving surface. If the operator elects to surface the new access road or pad, the surfacing material may be required to be removed at the time of reclamation.

Where possible, no improvements should be made on the unsurfaced access road other than to remove vegetation as necessary, road irregularities, safety issues, or to fill low areas that may sustain standing water.

The Authorized Officer reserves the right to require surfacing of any portion of the access road at any time deemed necessary. Surfacing may be required in the event the road deteriorates, erodes, road traffic increases, or it is determined to be beneficial for future field development. The surfacing depth and type of material will be determined at the time of notification.

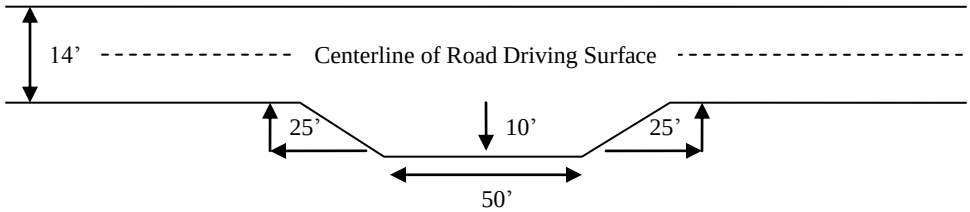
Crowning

Crowning shall be done on the access road driving surface. The road crown shall have a grade of approximately 2% (i.e., a 1" crown on a 14' wide road). The road shall conform to Figure 1; cross section and plans for typical road construction.

Turnouts

Vehicle turnouts shall be constructed on the road. Turnouts shall be intervisible with interval spacing distance less than 1000 feet. Turnouts shall be constructed on all blind curves. Turnouts shall conform to the following diagram:

Standard Turnout – Plan View

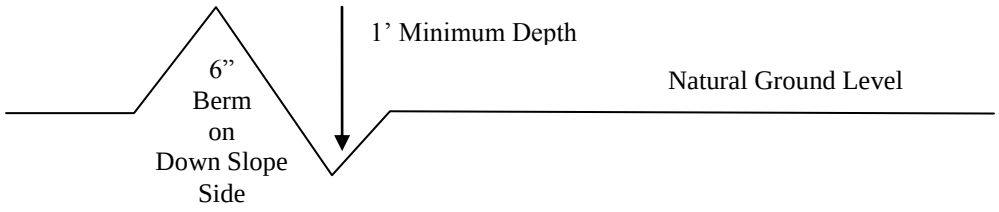


Drainage

Drainage control systems shall be constructed on the entire length of road (e.g. ditches, sidehill outsloping and insloping, lead-off ditches, culvert installation, and low water crossings).

A typical lead-off ditch has a minimum depth of 1 foot below and a berm of 6 inches above natural ground level. The berm shall be on the down-slope side of the lead-off ditch.

Cross Section Of Typical Lead-off Ditch



All lead-off ditches shall be graded to drain water with a 1 percent minimum to 3 percent maximum ditch slope. The spacing interval are variable for lead-off ditches and shall be determined according to the formula for spacing intervals of lead-off ditches, but may be amended depending upon existing soil types and centerline road slope (in %);

Formula For Spacing Interval Of Lead-off Ditches

Example - On a 4% road slope that is 400 feet long, the water flow shall drain water into a lead-off ditch. Spacing interval shall be determined by the following formula:

400 foot road with 4% road slope: $\frac{400'}{4\%} + 100' = 200'$ lead-off ditch interval

Cattleguards

An appropriately sized cattleguard(s) sufficient to carry out the project shall be installed and maintained at fence crossing(s).

Any existing cattleguard(s) on the access road shall be repaired or replaced if they are damaged or have deteriorated beyond practical use. The operator shall be responsible for the condition of the existing cattleguard(s) that are in place and are utilized during lease operations.

A gate shall be constructed and fastened securely to H-braces.

Fence Requirement

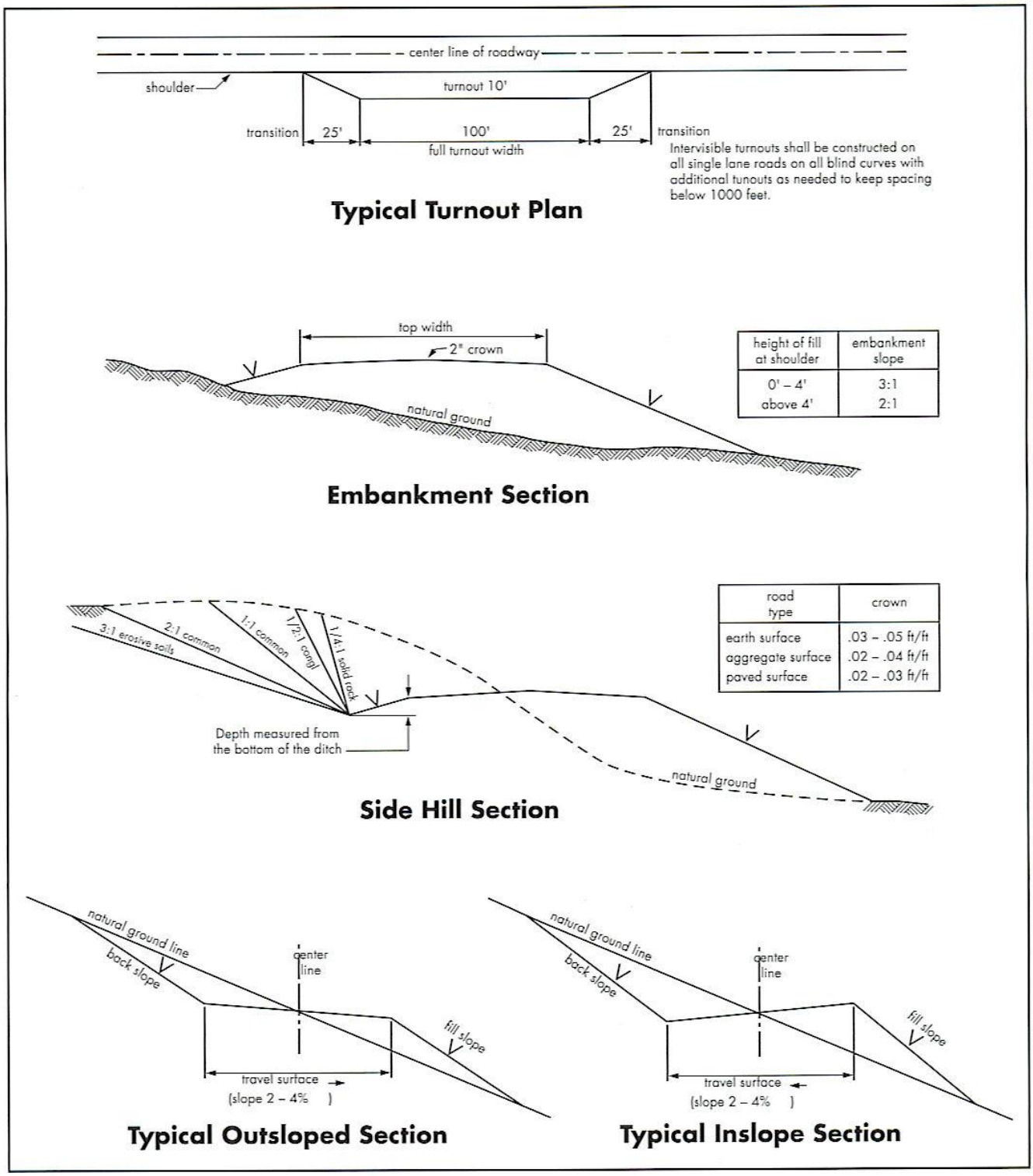
Where entry is required across a fence line, the fence shall be braced and tied off on both sides of the passageway prior to cutting.

The operator shall notify the private surface landowner or the grazing allotment holder prior to crossing any fence(s).

Public Access

Public access on this road shall not be restricted by the operator without specific written approval granted by the Authorized Officer.

Figure 1 – Cross Sections and Plans For Typical Road Sections



V. DRILLING

A. DRILLING OPERATIONS REQUIREMENTS:

1. Call the Roswell Field Office, 2909 West Second St., Roswell, NM 88201. During office hours call (575) 627-0205 or after office hours call (575) 910-6024. Engineer on call during office hours call (575) 627-0275 or after office hours call (575) 626-5749.

2. The BLM is to be notified a minimum of 24 hours in advance for a representative to witness:

   a. Spudding well
   b. Setting and/or Cementing of all casing strings

3. The BLM is to be notified a minimum of 4 hours in advance for a representative to witness:

   a. BOPE Tests

4. Unless the production casing has been run and cemented or the well has been properly plugged, the drilling rig shall not be removed from over the hole without prior approval.

5. Include the API Number assigned to well by NMOCD on the subsequent report of setting the first casing string.

6. The operator will accurately measure the drilling rate in ft/min to set the base of the usable water protection casing string(s) opposite competent rock. The record of the drilling rate along with the caliper-gamma ray-neutron well log run to surface will be submitted to this office as well as all other logs run on the borehole 30 days from completion

7. Air, air-mist or fresh water and non toxic drilling mud shall be used to drill to the base of the usable water protection casing string(s). Any polymers used will be water based and non-toxic.

B. CASING:

1. The **13-3/8** inch usable water protection casing string shall be set at approximately 510 ft. in competent bedrock.

If not, the operator is required to set usable water protecting casing in the next thick competent bedding (i.e. 15 to 25 ft or greater) encountered and cemented to the surface.

   a. If cement does not circulate to the surface, the Roswell Field Office shall be notified and a temperature survey utilizing an electronic type temperature survey

with a surface log readout will be used or a cement bond log shall be run to verify the top of the cement.

b. Wait on cement (WOC) time for a primary cement job will be a minimum 18 hours for a water basin or 500 pounds compression strength, whichever is greater. (This is to include the lead cement).

c. Wait on cement (WOC) time for a remedial job will be a minimum of 4 hours after bringing cement to surface or 500 pounds compression strength, whichever is greater.

d. If cement falls back, remedial action will be done prior to drilling out that string.

2. The minimum required fill of cement behind the **8-5/8** inch intermediate casing is **sufficient to circulate to the surface.** If cement does not circulate see B.1.a-d above.

3. The minimum required fill of cement behind the **5-1/2** inch production casing is **sufficient to tie back 500 feet above the uppermost perforation in the pay zone**. If cement does not circulate, a temperature survey utilizing an electronic type temperature survey with a surface log readout will be used or a cement bond log shall be run to verify the top of the cement.

4. If hardband drill pipe is rotated inside casing, returns will be monitored for metal. If metal is found in samples, drill pipe will be pulled and rubber protectors which have a larger diameter than the tool joints of the drill pipe will be installed prior to continuing drilling operations.

5. All casing shall be new or reconditioned and tested casing and meet API standards for new casing. The use of reconditioned and tested casing shall be subject to approval by the authorized officer. Approval will be contingent upon the wall thickness of any casing being verified to be at least 87-1/2 per cent of the nominal wall thickness of new casing.

C. PRESSURE CONTROL:

1. Before drilling below the **13-3/8** inch surface casing shoe, the blowout preventer assembly shall consist of a minimum of One Annular Preventer or Two Ram-Type Preventers and a Kelly Cock/Stabbing Valve. Before drilling below the **8-5/8** inch intermediate casing shoe, the blowout preventer assembly shall consist of a minimum of One Annular Preventer, Two Ram-Type Preventers, and a Kelly Cock/Stabbing Valve.

2. Before drilling below the **13-3/8** inch surface casing shoe, minimum working pressure of the blowout preventer and related equipment (BOPE) shall be **2000** psi. Before drilling below the **8-5/8** inch intermediate casing shoe, minimum working pressure of the blowout preventer and related equipment (BOPE) shall be **3000** psi.

3. The BOPE shall be installed before drilling below the **13-3/8** inch surface casing and the **8-5/8** inch intermediate casing and shall be tested as described in Onshore Order No.

2. Any equipment failing to test satisfactorily shall be repaired or replaced.

a. The BLM Roswell Field office shall be notified a minimum of 4 hours in advance for a representative to witness the tests.

b. The tests shall be done by an independent service company.

c. The BOP/BOPE test shall include a low pressure test from 250 to 300 psi. The test will be held for a minimum of 10 minutes if test is done with a test plug and 30 minutes without a test plug.

d. All tests are required to be recorded on a calibrated test chart. A copy of the BOP/BOPE test chart and a copy of independent service company test will be submitted to the BLM Roswell Field Office at 2909 West Second Street, Roswell, New Mexico 88201.

e. Testing fluid must be water or an appropriate clear liquid suitable for sub-freezing temperatures. Use of drilling mud for testing is not permitted since it can mask small leaks.

f. Testing must be done in a safe workman like manner. Hard line connections shall be required.

VI. PRODUCTION

Placement of Production Facilities

Production facilities should be placed on the well pad to allow for maximum interim recontouring and revegetation of the well location.

Containment Structures

The containment structure shall be constructed to hold the capacity of the entire contents of the largest tank, plus 24 hour production, unless more stringent protective requirements are deemed necessary by the Authorized Officer.

Painting Requirement

All above-ground structures including meter housing that are not subject to safety requirements shall be painted a flat non-reflective paint color, Juniper Green (Standard Environmental Color Chart June 2008).

VII. INTERIM RECLAMATION

If the well is a producer, interim reclamation shall be conducted on the well site in accordance with the Onshore Order No. 1. The operator shall submit a Sundry Notices and Reports on Wells (Notice of Intent), Form 3160-5, prior to conducting interim reclamation.

During the life of the development, all disturbed areas not needed for active support of production operations should undergo "interim" reclamation in order to minimize the environmental impacts of development on other resources and uses.

During reclamation, the removal of caliche is important to increasing the success of re-vegetating the site. Removed caliche may be used in road repairs, fire walls or for building other roads and locations. In addition, in order to operate the well or complete workover operations, it may be necessary to drive, park and operate on restored interim vegetation within the previously disturbed area. Disturbing re-vegetated areas for production or workover operations will be allowed. If there is significant disturbance and loss of vegetation, the area will need to be re-vegetated. Communicate with the appropriate BLM office for any exceptions/exemptions if needed.

VIII. FINAL ABANDONMENT & REHABILITATION REQUIREMENTS

a. Upon abandonment of the well and/or when the access road is no longer in service, a Notice of Intent for Final Abandonment with the proposed surface restoration procedure must be submitted for approval.

b. Upon abandonment of the well, all casing shall be cut-off at the base of the cellar or 3-feet below final restored ground level (whichever is deeper). The well bore shall then be covered with a metal plate at least ¼ inch thick and welded in place. The following information shall be permanently inscribed on the dry hole marker: Well name and number, the name of the operator, the lease serial number, the surveyed location (the quarter-quarter section, section, township and range or other authorized survey designation acceptable to the authorized officer; such as metes and bounds).

c. Surface Reclamation must be completed within 6 months of well plugging. If the operator proposes to modify the plans for surface reclamation approved on the APD, the operator must attach these modifications to the Subsequent Report of Plug and Abandon using Sundry Notices and Reports on Wells, Form 3160-5.

PECOS DISTRICT, BLM
SEED MIX FOR
Range Site: Sandy Plains HP-3

Common Name and Preferred Variety	Scientific Name	Pounds of Pure Live Seed Per Acre
Sideoats grama var. Vaughn or El Reno	(*Bouteloua curtipendula)*	2.0
Little bluestem	(*Andropogon scoparium)*	2.5
Sand bluestem	(*Andropogon halli)*	1.5
Sand dropseed	(*Sporobolus cryptandrus)*	1.0
Bush penstemon	(*Penstemon ambiguous)*	1.0
Desert or Scarlet Globemallow *or*	(*Sphaeralcea ambigua S. coccinea)* _____	1.0
TOTAL POUNDS PURE LIVE SEED (pls)PER ACRE		9.0

Certified Weed Free Seed

IF ONE SPECIES IS NOT AVAILABLE,
INCREASE ALL OTHERS PROPORTIONATELY
Mix must include a minimum of 4 species, including one forb species.
No less than 9.0 pounds lbs per acre shall be applied

IX. PIPELINE PROTECTION REQUIREMENT

Precautionary measures shall be taken by the operator during construction of the access road to protect existing pipelines that the access road will cross over. An earthen berm; 2 feet high by 3 feet wide and 14 feet across the access road travelway (2' X 3' X 14'), shall be constructed over existing pipelines. The operator shall be held responsible for any damage to existing pipelines. If the pipeline is ruptured and/or damaged the operator shall immediately cease construction operations and repair the pipeline. The operator shall be held liable for any unsafe construction operations that threaten human life and/or cause the destruction of equipment.

EXHIBIT C
SENM-S-22

December 24, 2008

PRAIRIE CHICKENS

No surface use is allowed during the following time periods; unless otherwise specified. This stipulation does not apply to the operation and maintenance of production facilities.

On the land described below:

1600' FNL & 1710 FWL, Unit F, Sec. 27 T7S-R37E
Roosevelt County, New Mexico NMPM
Mineral Lease # NM-54449

For the purpose of: Protecting Lesser Prairie-Chickens

Drilling for oil and gas, and 3-D geophysical exploration operations will not be allowed in Lesser Prairie Chicken Habitat during the period of March 1 through June 15, each year. During that period, between 3:00 a.m. and 9:00 a.m., other activities that produce noise and involve human activity, such as geophysical exploration other than 3-D operations, and pipeline, road, and well pad construction, will not be allowed. Noise producing activities which do not require a human presence, such as venting, flaring, or pumping, are exempt from the 3:00 a.m. and 9:00 a.m. restriction. Regardless of the time of year, exhaust noise from pump jack engines must be muffled or otherwise controlled so as not to exceed 75 db measured at 30 feet from the source of the noise.