

United States
Department of the Interior
Bureau of Land Management

Miles City Field Office

Brigham Oil & Gas LP
Application for Permit to Drill

Environmental Assessment (EA)
DOI-BLM-MT-C020-2013-0026-EA

For Further Information Please Contact:

Bureau of Land Management
Miles City Field Office
111 Garryowen Road
Miles City, Montana 59301
406-233-2800

BLM



**UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT**

ENVIRONMENTAL ASSESSMENT REVIEW

OFFICE/AREA: Miles City Field Office	EA#: DOI-BLM-MT-C020-2013-026-EA
	DATE POSTED: October 29, 2012
NAME/LOCATION: Brigham Oil & Gas LP Richland County, Montana Berry 21-28 1H MTM97819; T26N, R59E, Sec. 21, NENW	DATE DUE: November 5, 2012
	FUNDING: 9141 EJ

ORIGINATOR DATE/INITIALS	TITLE	ASSIGNMENT
Rick Lang	Natural Resource Specialist	Oil & Gas

REVIEWERS	TITLE	ASSIGNMENT	DATE/INITIALS
Dale Tribby	Wildlife Biologist	Wildlife	<i>10/29/2012 dct</i>
Doug Melton	Archaeologist	Cultural Resources	11/07/12 DM Cultural Report MT-020-12-268
Paul Helland	Petroleum Engineer	Down Hole	10-30-2012 PH
Dan Benoit	Sup. Natural Resource Specialist	Reviewer	11/08/12 DAB



ENVIRONMENTAL COORDINATOR

11/13/12
DATE

ENVIRONMENTAL ASSESSMENT

EA NUMBER: DOI-BLM-MT-C020-2013-026-EA

PROPOSED ACTION/TITLE TYPE: Application for Permit to Drill (APD) to drill and produce one horizontal Bakken oil well in Richland County, Montana.

LOCATION OF PROPOSED ACTION:

Berry 21-28 1H; MTM97819; T26N, R59E, Sec. 21, NENW

PREPARING OFFICE: Miles City Field Office (MCFO).

APPLICANT: Brigham Oil & Gas LP.

DATE OF PREPARATION: October 29, 2012

CONFORMANCE WITH APPLICABLE LAND USE PLAN: This proposed action is in conformance with the Big Dry RMP Record of Decision approved in 1996. On page 14 of the ROD, it states “The BLM planning process determines availability of federal lands for oil and gas leasing where BLM is the surface management agency.”, and on page 13, “A lease grants the right to explore, extract, remove, and dispose of oil and gas deposits that may be found on the leased lands. The lessee may exercise the rights conveyed by the lease, subject to lease terms and any lease stipulations and permit approval requirements.”

BACKGROUND: This Environmental Assessment (EA) has been prepared in response to one APD submitted by Brigham Oil & Gas LP. The proposed well would be a horizontal oil well. The well pad would be built to accommodate two wells; however, the initial proposal is for one test well. The proposed well would be drilled and if commercial quantities are found then three additional wells would be drilled on the location. The well pad, production facilities, and access road would be located on private surface, private mineral, and would penetrate a federal lease and produce from the Bakken formation. These locations and access road are on private surface situated over private minerals (not located on the Federal lease).

Because the surface location of this well is located on private land and off of the Federal lease, the requirements for protection of surface resources and mitigation of environmental impacts resulting from locating and constructing the well site would be primarily subject to state or local regulation.

Table 1

Well, Lease Number	Surface Hole Location	Pad Size (footages) (acres & max cut/fill)	Access Road (footages) (acres)
Berry 21-28 1H MTM97819	T26N, R59E, Sec. 21, NENW 614' FNL, 2331' FWL	550' x 550' (7.0 acres; 46.5 / 26.6)	2112' x 25' (1.8 acres)
Total Acres Disturbed:	---	7.0 acres	1.2 acres

PURPOSE AND NEED FOR THE ACTION: The purpose and need of this action is to determine whether to permit environmentally responsible exploration and development of the oil and gas resource within the project area, consistent with the existing leases to continue to meet the nation's energy needs. This includes development of this project with the appropriate mitigation and within the constraints of applicable policies, regulations, and laws.

DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES:

PROPOSED ACTION: This alternative includes drilling, completion, production, abandonment of one federal horizontal oil well and associated access road, well pad, and production facilities (See Table 1). The operator proposes to begin these operations upon receipt of permit approval, with drilling operations lasting approximately 60 days.

Well Site Drilling

The drilling operations for each well would start upon receipt of an approved application for permit to drill, and would take approximately 30 days after spudding, followed by additional 30 days for well completion and installation of production facilities. The Berry 21-28 1H well would be horizontally drilled with a closed loop system into the Bakken Formation to an approximate total measured depth (TMD) of 20,015 feet. Surface casing (9 5/8") would be set at approximately 1,800 feet and cemented back to the surface. The well would then be drilled below the casing to an approximate TMD of 20,015 feet. There is a slight chance of encountering hydrogen sulfide (H₂S) while drilling the intermediate portion of the hole. The potential H₂S zone will be isolated with 7" steel casing and cement prior to drilling the horizontal portion of the hole. An appropriately sized Blowout Preventer (BOP) would be used to control the well and prevent an accidental release of hydrocarbons or salt water into the environment.

Fresh water mud would be used while drilling down to surface casing setting depth, invert (oil based) mud system would be used for drilling the vertical section and a salt water based fluid would be used in the horizontal section of the well. The well would be fracture stimulated and completed for production if economically recoverable quantities of oil are found. The well would be plugged according to federal requirements when no longer needed.

At the drilling locations, drilling cuttings would be placed into a cuttings only pit approximately 100' L x 45' W x 12' deep. All of the pits would be excavated in "cut" material on the pad. All drilling fluids, including any salts and/or chemicals utilized in the mud system would be contained within a closed loop system and then hauled to an approved disposal facility. The water and/or oil based drilling fluids would be stored in 400 barrel (bbl), steel tanks on the location in an area that would be diked. These fluids would be recycled during drilling operation by centrifuging the returns to separate the drilled cuttings from the oil and water based fluids. Upon completion, remaining oil and water based fluids would be removed from the well location and recycled or disposed of at the approved disposal facility in accordance with the Montana Department of Environmental Quality (DEQ) rules and regulations. Produced fluids would be placed in test tanks on location. Any spills of oil, gas, salt water or any other potentially hazardous substance would be cleaned-up and immediately removed and disposed of to an approved disposal site. All garbage and non-flammable solid waste materials would be contained in self-contained, portable dumpster or trash cages. Upon completion of operations, or as needed, the accumulated trash would be hauled off-site to a Montana DEQ approved sanitary landfill. No trash would be placed in the reserve pit. Chemical "porta-potties" would be located at active construction and drilling sites. Sewage would be disposed of in an approved sewage disposal facility in accordance with Montana DEQ rules and regulations.

Immediately after removal of the drilling rig, all debris and other materials not contained in the trash cage would be cleaned up and removed from the well location. No potentially adverse materials or substances would be left on the location.

Well Site Completion

Bakken and Three Forks wells typically undergo fracture stimulation as part of the well completion process. Fracture stimulation (i.e., hydraulic fracturing or “fracing”) is a process used to maximize the extraction of underground resources by allowing oil or natural gas to move more freely from the rock pores to production wells that brings the oil or gas to the surface. The hydraulically created fracture acts as a conduit in the rock formation, allowing oil or gas to flow more freely through the fracture system, and to the wellbore where the oil or gas is produced to the surface.

To create or enlarge fractures, fluid comprised typically of water and additives is pumped into the productive formation at a gradually increasing rate and pressure. Hydraulic fracturing fluid is approximately 98 percent water with the remainder being chemical additives and propping agents (proppant), such as sands. Chemicals used in stimulation fluids include acids, friction reducers, surfactants, potassium chloride (KCl), gelling agents, scale inhibitors, corrosion inhibitors, antibacterial agents, and pH adjusting agents and typically comprise less than 2% of the total fluid. When the pressure exceeds the rock strength, the fluids create or enlarge fractures that can extend several hundred feet away from the well. As the fractures are created, a propping agent (usually sand) is pumped into the fractures to keep them from closing when the pressure is released. After fracturing is completed, the majority of the injected fracturing fluids returns to the wellbore and is reused or disposed of at an approved disposal facility.

A typical fracture stimulation technique involves 20-30 stages which partition the wellbore into segments which are each separately fracture stimulated. This allows for more efficient use of frac fluid and proppant and a more evenly distributed treatment of the full length of the wellbore. This multi-stage hydraulic fracturing has allowed development of the Bakken and Three Forks formations that previously were uneconomic due to low permeability.

Well Site Production

The well pad surface production facilities at each site would consist of a pump-jack, flare pit, heater treater, and production tanks. The tanks and heater treater would be surrounded on four sides by an impermeable dike which would hold 110% of the capacity of the largest vessel and would be independent of the back cut. Load lines would be located within the tank battery berm and would have a drip barrel installed under each outlet.

NO ACTION ALTERNATIVE

The no action alternative would not authorize the drilling, testing and completion of the proposed well. No action, would mean no need to plug the well or reclaim areas.

AFFECTED ENVIRONMENT: The following critical resources have been evaluated and are not affected by the proposed action or the alternatives in this EA:

Mandatory Item	Potentially Impacted	No Impact	Not Present On Site
Threatened and Endangered Species			X
Floodplains			X
Wilderness Values			X
ACECs			X
Water Resources	X		
Air Quality	X		
Cultural or Historical Values		X	
Prime or Unique Farmlands			X

Wild & Scenic Rivers			X
Wetland/Riparian			X
Native American Religious Concerns			X
Wastes, Hazardous or Solids			X
Invasive, Nonnative Species	X		
Environmental Justice		X	

The following non-critical resources would not be impacted by this proposed action; therefore, they would not be analyzed in detail by this Environmental Assessment: Fire, Forestry, Geology, Lands/Realty, Recreation, Wetlands, Livestock Grazing, or Ecologically Critical Areas.

Air: The proposed well sites and access road are located in a Class II air quality rating area, which is an area that allows moderate degradation above “baseline” including most of the United States. The air will contain some pollution from the oil and gas activities in the area within a few miles radius of the well, including extremely low levels of hydrogen sulfide gas, sulfur dioxide gas from venting and flaring activities, and dust particulates from surface-disturbing activities. The nearest Class I air shed is the northern portion of Theodore Roosevelt National Park in western North Dakota, which is approximately 90 miles southeast of the project area. The dominate wind direction in this area is from the west.

Cultural Resources: The proposed action has been inventoried for cultural resources. One historic isolate (a modern corral) was not in the inventory area for the proposed access. The isolate is not eligible for listing on the National Register of Historic Places (See BLM Cultural Resources Report MT-020-12-268). BLM determined that the proposed project would have no effect to historic properties. The Montana SHPO concurred with BLM’s determination of no effect to historic properties on July 10, 2012.

Hydrology: The proposed Berry well site and access road are located .5 miles southwest of the Missouri River. The water quality of surface runoff is determined by the soil chemistry, topography and the quantity of vegetation. Protection of the soil by vegetation is an important component for the prevention of erosion and improvement of the surface water quality. Well vegetated shallow slopes (less than ~3:1) yield runoff which is of relative good quality. Stream chemistry is determined by runoff water mixing with groundwater inputs.

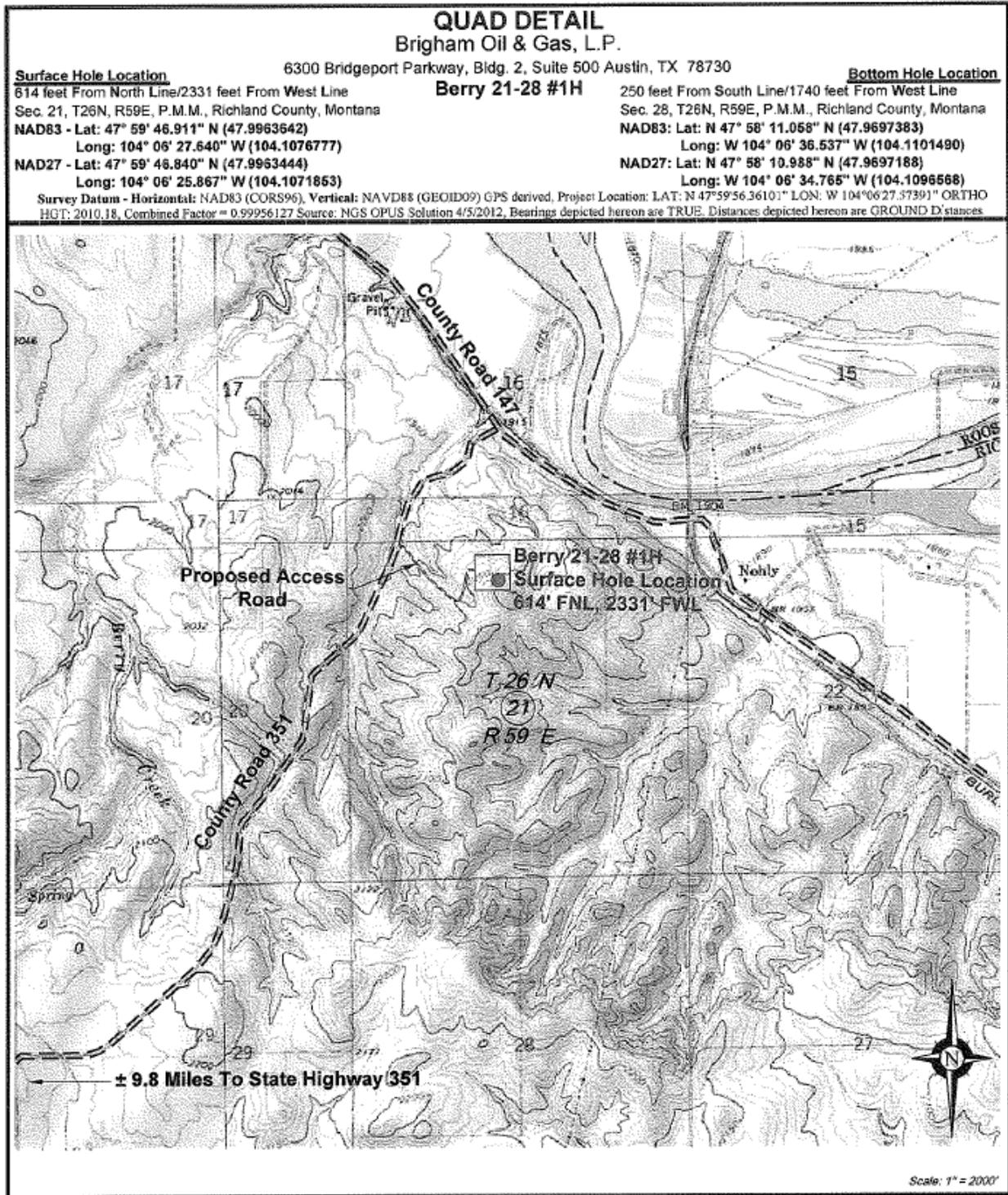
The Fox Hills is typically the area’s deepest fresh water aquifer and is geologically isolated from the Bakken/Three Forks formations by multiple massive shale zones and salt zones. Vertical distance between the Bakken/ Three Forks and the base of the Fox Hills is about 7,000-8,000 feet.

Soils: Soil affected by the well site and access road was identified from the U.S. Department of Agriculture, Natural Resources Conservation Service Soil Survey Geographic (SSURGO) database for Richland County, Montana. Soils affected by the proposed actions are the Vida and Lambert series. The Vida series consists of very deep, well drained soils that formed in till. These soils are on till plains and hills. For the Official Series Description visit:<http://soils.usda.gov/technical/classification/osd/index.html>.

Vegetation: The well site and access road would be located in areas primarily dominated by native grasses, shrubs, and forb species. Trees are uncommon in the immediate community but when present are dispersed in drainages and gullies and can include Green ash (*Fraxinus pennsylvanica*), Juniper (*Juniperus Scopulorum*), Cottonwood (*Populus spp.*), Maple (*Acer spp.*) Elm (*Ulmus spp.*), and Willow (*Salix spp.*). A few smaller shrubs include but are not limited to Sagebrush (*Artemisia spp*), Buffaloberry (*Shepherdia argentea*), buckthorn (*Rhammus cathartica*), and hawthorn (*Cratagegus rotundifolia*). The primary graminoids are characteristic of shortgrass and mixed-grass prairie ecosystems and are dominated by the family Poaceae. Grasses include but not limited to Western wheatgrass, (*Agropyron smithii*) Green needlegrass (*Nassella veridula*), Blue grama (*Bouteloua gracilis*), Little bluestem (*Schizachyrium scoparium*), and Prairie sandreed (*Calamovilfa longifolia*). Some forb species include but not limited to Wild rose (*Rosa spp.*), sagewort (*Artemesia campestris*), Winter fat (*Krashkinninikovia lanata*), prickly pear (*Opuntia polyacantha*), Clubmoss (*Lycopodium spp.*), and some legumes. Current

land uses in the area include livestock grazing and ranching, cultivated agriculture, oil and gas development, and wildlife habitat.

Map 1- Location of proposed location



Wildlife: In general, wildlife species that may be found utilizing the project area include whitetail and mule deer, pronghorn, sharp-tailed grouse, pheasants and numerous migratory birds including – Western Meadowlark, Lark Bunting, Grasshopper Sparrow, Chestnut-collared Longspur, Golden Eagle, Rough

legged Hawk and Swainson's Hawk. The project area is within designated crucial mule and whitetail winter range. The project area lies within the migratory path of the Endangered Whooping Crane; however, the proposed project site is not considered prime habitat for whooping crane feeding or roosting. The well site does not contain habitat for listed threatened or endangered species.

ENVIRONMENTAL IMPACTS:

DESCRIPTION OF IMPACTS FROM THE PROPOSED ACTION:

Air: Air quality could be temporarily affected by increased dust levels, exhaust gases from rig and vehicle engines, short or long term venting/flaring of gas and other activities related to the surface disturbance, the drilling, and completion of the well. The impacts would be minor and of short duration.

The general area surrounding the proposed well site has a Class II air quality rating. The air would contain some pollution from the oil and gas activities in the oil fields in the surrounding area, including hydrogen sulfide gas, sulfur dioxide gas from venting and flaring activities, emissions from the power plant and other sources surrounding the area such as, vehicle emissions, and dust particulates from other surface disturbing activities.

Cultural: The proposed action would have no effect to historic properties. One historic isolate was observed in the proposed access but is not eligible for listing on the National Register of Historic Places. Unanticipated discoveries of cultural or paleontological materials during construction of the well and access would be dealt with by implementation of Condition of Approval # 9 attached to this document.

Hydrology: Using a fresh water mud system and cementing the surface casing string from about 1,800 feet back to the surface would protect the shallow aquifers. Deeper aquifers and potentially productive hydrocarbon zones would be protected through the use of production casing, and cementing. In addition the proper installation of culverts and erosion control would mitigate runoff during times of precipitation and effects would also be minimal.

The proposed producing fractured zone depth is 9000 to 11,000 feet in depth, well below the typical depth of usable ground water. Well bore construction isolates the Fox Hills and shallower formations with surface casing set below the base of the Fox Hills and cemented to surface. Production casing is set from the surface to the producing formation and is typically cemented to 4000 to 5000 feet above the producing formation. These factors combine to protect usable ground water from the fracturing process. Approximately 20 to 30 stimulation stages (every 300 to 500 feet) would be needed for a typical horizontal well bore to fracture stimulate the formation. Each stage requires approximately 1400 barrels of fluid (an average of about 36,000 barrels per well). Stimulation fluid would be disposed of at an approved disposal facility or recycled for reuse or a combination of both.

Wildlife: Approximately 9 acres of native prairie would be altered to construct the well pad and access route to the proposed project sites. Construction, drilling, production and/or vehicle traffic would result in permanently or temporary displacement of some wildlife species including migratory bird species. Mortality of some relatively small, immobile species may occur as a result of construction. On a landscape basis, new road and well pad would contribute to additional habitat fragmentation and loss, and dispersion of certain wildlife species. A loss of habitat for nesting, foraging, breeding, and cover for those species of wildlife associated with these habitat types would occur during the life of the well, which may include migratory bird species. The proposed project site is not considered prime habitat for whooping crane feeding or roosting. Because of the lack of T & E species habitat in the proposed area, there would be no known adverse effect to any known federally listed T & E wildlife species.

CUMULATIVE IMPACTS FROM THE PROPOSED ACTION:

Development in the area was analyzed in this environmental assessment using a one mile radius applied around the proposed well to determine the potential cumulative impact upon the environment. Application of the one mile radius indicates that there are 0 Abandon wells, 1 producing oil wells, and 2 water wells. The primary use of this area is grazing, with native rangelands, and some dry land and irrigated land farming.

The proposed well is located in upland area of both perennial and annual vegetation, surrounded by agriculture and grasslands at a much broader scale. The proposed well site and surrounding area serves as wildlife habitat for a variety of species. The addition of the proposed well and constructed access route will impact individual wildlife species; however, the result of all past actions coupled with this action would increase the extent of stressors on the native fauna within the area.

Cumulative effects from implementing the proposed action are anticipated for air quality for a period of less than five years. If flaring of casing head gas is required to produce the well, there could be long term minor impacts to air for the life of this (about 20 years). In addition, both short term (<5 years) and long term (>5 years) effects are expected for soils, range, vegetation, hydrology, and wildlife.

Water resources have been impacted by the cumulative effects of activities that occur, including agriculture, mineral exploration and development, and pollution. There would be continuing impacts from existing disturbances from oil wells, ongoing reclamation, pipeline installation, construction and other related surface disturbing activities in the area. As a result of the latter existing activities, erosion, sedimentation, and run-off may persist to some degree. These impacts decrease watershed health and water quality.

Over the last 10 years, advances in multi-stage and multi-zone hydraulic fracturing has allowed development of gas fields that previously were uneconomic. Horizontal Drilling can result in longer drilling times and greater water use-but it can also result in less surface disturbance and greater resource extraction. Hydraulic fracturing is a common process in the Williston Basin and applied to nearly all wells drilled. The producing zone targeted by the Proposed Action is well below any underground sources of drinking water. There are no known instances of hydraulic fracturing operations in the Bakken/Three Forks formations adversely affecting groundwater.

The proposed well and access road would increase surface disturbance by approximately 9 acres. The additional acres of disturbance added to the areas total is not considered to have a measurable impact on any resource.

DESCRIPTION OF IMPACTS FROM THE NO ACTION ALTERNATIVE:

The no action alternative would be that BLM would not authorize any construction, drilling or production activities needed for the horizontal oil well proposed to enter and produce from Federal leases. Consequently, there would not be any additional impacts to the environment except for mineral resources. However, there would be continuing impacts from existing disturbances from farming, ongoing reclamation, infrastructure construction and installation, and other related surface disturbing activities in the area.

An alternate potential outcome resulting from selection of the No Action alternative is that if the federal APD is denied the well pad would still be constructed and several fee mineral wells would be drilled without BLM involvement or approval as long as federal minerals or surface were not involved. However, it is unknown what the proponent's plans would actually entail if the APD was not approved.

Minerals: Under this Alternative, if BLM does not approve the applications, portions of the Federal leases would not be tested by the proposed well; which could result in oil not being produced from the leases. No production from the Federal leases would result in the loss of additional oil being added to the market place, and loss of royalties to the Federal and State governments. The Federal government would receive 12.5% royalty from the share of oil produced from the federal leases and one half of these royalties would return to the state Montana. If BLM does not approve the applications, the well would not be drilled and tested which would result in the loss of subsurface information in the area.

MITIGATION AND RESIDUAL IMPACTS:

Drilling Operations: The drilling location shall be cleaned of all debris, material and equipment after the well is completed. Equipment cannot be stored on the topsoil stockpile.

The pit shall be lined with a minimum 12 millimeter impermeable synthetic liner and permeability < 10⁻⁷ cm/sec; resistant to UV, weathering, chemicals, punctures, and tearing; and be placed on bedding material if bedrock is abrasive. The liner shall be installed in accordance with the manufactures requirements on material that will not tear or puncture the liner.

If cuttings pit contains any fluids, it shall be netted or flagged to prevent the entry of migratory birds and other wildlife. If cuttings pit contains any fluids, a minimum of 2 feet of freeboard must be maintained in the pit.

Wildlife: As per the USFWS Standard Conditions and Recommendations, work would cease if whooping crane sightings occur within one mile of the proposed project area. In coordination of the Service, work may resume when the crane(s) have left the area.

CONSULTATION/COORDINATION: BLM staff from MCFO

LIST OF PREPARERS:

Dale Tribby	Wildlife Biologist
Doug Melton	Archaeologist
Paul Helland	Petroleum Engineer
Rick Lang	Natural Resource Specialist

REFERENCES:

- Big Dry RMP/EIS (Final), Appendix Minerals;
- Oil & Gas RMP/EIS pgs 49-54, 75-77
- Brigham Oil & Gas LP, APDs: Berry 21-28 1H
- BLM Cultural Resource Reports MT-020-12-268

**UNITED STATE DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
MILES CITY FIELD OFFICE
111 GARRYOWEN ROAD
MILES CITY, MONTANA 59301-7000**

**Finding of No Significant Impact
Environmental Assessment DOI-BLM-MT-C020-2013-026-EA**

INTRODUCTION:

The Bureau of Land Management (BLM) completed an Environmental Assessment (EA), No. DOI-BLM-MT-C020-2013-026 for one of Brigham Oil & Gas LP Applications for Permit to Drilling (APD). The APD includes the drilling, completing, and producing of one Bakken horizontal oil well, along with installation of the associated infrastructure, and reclamation of disturbed areas. The average production life of a well is expected to be 10 to 20 years with final reclamation to be completed 2 to 3 years after plugging of the well.

The EA analyzed the No Action Alternative and the Proposed Action with BLM imposed mitigation measures. The EA is attached to and incorporated by reference in this Finding of No Significant Impact (FONSI) determination.

PLAN CONFORMANCE AND CONSISTENCY:

The proposed action and alternatives have been reviewed and found to be in conformance with one or more of the following BLM Land Use Plans and the associated decision(s):

1. Big Dry RMP/EIS (Final) pgs 11_12, 63, 65, 71, 92,-96, 111-114, 144, 146, 148, 149, 151, 152, 155, 156, 302_330, 357_359, Appendix Minerals; EIS on O&G D&P in MT pgs 59, 79-107.
2. Oil & Gas RMP/EIS pgs 49-54, 75-77

Finding of No Significant Impact Determination: Based upon a review of the EA and the supporting documents, I have determined that the project is not a major federal action significantly affecting the quality of the human environment, individually or cumulatively with other actions in the general area. No environmental effects meet the definition of significance in context or intensity, as defined in 40 CFR 1508.27, and do not exceed those effects described in the Big Dry RMP. Therefore, an environmental impact statement is not needed. This finding is based on the context and intensity of the project as described below.

Context: The project area includes 0 abandoned oil wells, one producing oil well, and two water wells. From each location it is proposed that a directional wellbore will be drilled laterally through the Bakken Shale formation on private mineral estate, and drill laterally through the Bakken Shale formation in Federal minerals.

Intensity: The following discussion is organized around the Ten Significance Criteria described in 40 CFR 1508.27.

1. Impacts may be both beneficial and adverse. The proposed action would impact resources as described in the EA. Mitigation measures to minimize or eliminate adverse impacts were identified in the analysis and will be included as Conditions of Approval with the approved permits. The EA also disclosed beneficial impacts from the proposed project, such as the potential to bring additional oil and

gas into the market place and increase revenues to federal and state and local governments. And, also, to obtain scientific data of the local geology, and to increase the knowledge base of the mineral resources potential.

2. The degree to which the selected alternative will affect public health or safety. The selected alternative minimizes adverse impacts to public health and safety by project design and additional mitigation measures.

3. Unique characteristics of the geographic area such as proximity to historic or cultural resources, park lands, prime farm lands, wetlands, wild and scenic rivers, or ecologically critical areas. The historic and cultural resources of the area have been reviewed by an archeologist and no potential impacts were indicated in the design of the proposed action (See the Cultural Report #s listed in the EA). There are no effects on park lands, prime farm lands, wetlands, wild and scenic rivers, or ecologically critical areas.

4. The degree to which the effects on the quality of the human environment are likely to be highly controversial. The environmental analysis did not show any highly controversial effects to the quality of the human environment.

5. The degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks. The project is not unique or unusual because BLM and both the States of Montana and of North Dakota have approved similar actions in the same geographic area. The environmental effects to the human environment are analyzed in the environmental assessment. There are no known predicted effects on the human environment that are considered to be highly uncertain or involve unique or unknown risks.

6. The degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration. The actions considered in the preferred alternative were considered by the interdisciplinary team within the context of past, present, and reasonably foreseeable future actions. The action would not establish a precedent, since the project area is in the general area of oil and gas development for the Bakken formation.

7. Whether the action is related to other actions with individually insignificant but cumulatively significant impacts. The interdisciplinary team evaluated the possible actions in context of past, present and reasonably foreseeable actions. The analysis did not disclose any significant cumulative impacts. A disclosure of the effects of the project is contained in the environmental assessment.

8. The degree to which the action may adversely affect districts, sites, highways, structures, or other objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historical resources. The project will not affect districts, sites, highways, structures, or other objects listed on or eligible for listing in the National Register of Historic Places, nor will it cause loss or destruction of significant scientific, cultural, or historical resources.

9. The degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act of 1973. There are no threatened or endangered species or habitat in the area of the proposed action. There are no threatened or endangered plant species or habitat in the area.

10. Whether the action threatens a violation of a Federal, State, Local, or Tribal law, regulation or policy imposed for the protection of the environment, where non-Federal requirements are consistent with Federal requirements. The project does not violate any known Federal, State, Local or Tribal law or requirement imposed for the protection of the environment. Furthermore, the project is consistent with applicable BLM plans, policies, and programs.



11/14/2012

Approved By: _____

For Todd D. Yeager
Field Manager
Miles City Field Office

Date

**UNITED STATE DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
MILES CITY FIELD OFFICE
111 GARRYOWEN ROAD
MILES CITY, MONTANA 59301-7000**

**Decision Record
Environmental Assessment DOI-BLM-MT-C020-2013-026-EA**

Decision:

Based upon the analysis of potential environmental impacts and mitigation measures described in EA DOI-BLM-MT-C020-2013-026, it is my decision to select the Proposed Action, including the mitigation measures from the EA and approve the Applications for Permit to Drill (APD) for the Berry 21-28 1H well, submitted by Brigham Oil & Gas LP and modified by the attached conditions of approval.

The proposed well would be horizontal oil well located on private surface, private mineral, and would penetrate federal leases and would produce from the Bakken formation. These locations would be situated on private surface over private minerals (not located on the Federal lease). Therefore, construction activities and mitigation measures applied for the protection of surface, environment, and the interest of the surface owner, is primarily the obligation of the state permitting agencies, the mineral lessee/operator, and the surface owner.

Approved project components include:

- Drilling, completion, production, routine operation of the proposed oil well.
- Placement of surface facilities such as production facilities, and other equipment associated with these federal horizontal Bakken oil well, needed to increase oil recovery for the life of the project.
- The APD's will be approved with mitigation incorporated in the Conditions of Approval.

Authorities: The authority for this decision is contained in 43 CFR 3162.3-1.

Compliance and Monitoring: BLM will conduct compliance and monitoring inspections during the different phases of operations. Inspections will be conducted to determine whether or not operations are being conducted in compliance with the approved permit. Monitoring inspections will be conducted to determine the effectiveness of mitigation measures, results of reclamation work, and impacts to other resources. Based upon the results of inspections, BLM could impose requirements to modify operations to minimize or eliminate adverse impacts to other resources.

Terms / Conditions / Stipulations: The following mitigation measures were analyzed in the EA and are attached below (letter to the operator) and included as Conditions of Approval with the approved APD.

Appeals: You have the right to request a State Director Review of this decision and these Conditions of Approval pursuant to 43 CFR 3165.3(b). An SDR request, including all supporting documentation shall be filed with the Montana State Office, State Director (MT-920) at 5001 Southgate Drive, Billings, Montana 59101-4669 within 20 business days of your receipt of this decision. If adversely affected by the State Director's decision, it can be further appealed to the Interior Board of Land Appeals (IBLA) pursuant to 43 CFR 3165.4, 43 CFR 4.411, and 43 CFR 4.413. If a statement of reasons for the appeal is not included with the notice, it must be filed with the Interior Board of Land Appeals, Office of Hearings and Appeals, U.S. Department of the Interior, 801 North Quincy St., Suite 300, Arlington, VA 22203

within 30 days after the notice of appeal is filed with the authorized officer.

If you wish to file a petition for stay pursuant to 43 CFR Part 4.21(b), the petition for stay should accompany your notice of appeal and shall show sufficient justification based on the following standards:

- (1) The relative harm to the parties if the stay is granted or denied,
- (2) The likelihood of the appellant's success on the merits,
- (3) The likelihood of irreparable harm to the appellant or resources if the stay is not granted, and
- (4) Whether the public interest favors granting the stay.

If a petition for stay is submitted with the notice of appeal, a copy of the notice of appeal and petition for stay must be served on each party named in the decision from which the appeal is taken, and with the IBLA at the same time it is filed with the authorized officer.

A copy of the notice of appeal, any statement of reasons and all pertinent documents must be served on each adverse party named in the decision from which the appeal is taken and on the Office of the Regional Solicitor, U.S. Department of the Interior, P.O. Box 31394, Billings, Montana 59107-1394, not later than 15 days after filing the document with the authorized officer and/or IBLA.

Should you fail to timely request an SDR, or after receiving the State Director's decision, fail to timely file an appeal with IBLA, no further administrative review of this decision would be possible.



Approved By: _____
for Todd D. Yeager
Field Manager
Miles City Field Office

11/14/2012

Date



United States Department of the Interior



In Reply To:

BUREAU OF LAND MANAGEMENT
Miles City Field Office
111 Garryowen Road
Miles City, Montana 59301-7000
<http://www.blm.gov/mt>

3160 (MTC022)
MTM97819

Brigham Oil & Gas LP
Attn: Kenneth Klanika
1675 Broadway, Suite 1600
Denver, CO 80202

Dear Mr. Klanika:

Your application to drill the Berry 21-28 1H well into Federal Lease MTM97819 located in (NE $\frac{1}{4}$ NW $\frac{1}{4}$) of Section 21, T. 26 N., R. 59 E, in Richland County, Montana, is approved subject to the provisions of the Applications for Permit to Drill, including the drilling and surface use programs submitted with your application, plus the following Conditions of Approval.

CONDITIONS OF APPROVAL

1. Site Specific:

As per the USFWS Standard Conditions and Recommendations, work would cease if whooping crane sightings occur within one mile of the proposed project area. In coordination of the Service, work may resume when the crane(s) have left the area.

A. Production Facilities:

1. If a tank battery is constructed on location, each tank setting, treater, and separator, must be surrounded on all sides by an impermeable dike of sufficient capacity to adequately contain 110% of the contents of the largest vessel within it, plus one (1) day's production.

B. Drilling Operations:

1. The pit shall be fenced on three sides during drilling operations and the fourth side after completion of drilling operations. The fence shall be constructed to the following requirements: posts to be no more than 16' apart; fence wire: four wires of at least 12.5 gauge, double strand twisted; two stays between posts; wire stretched taut between brace panels, wire spacing from the ground up: 14", 22", 30", 42" OR steel panels may be used to fence the pit. If steel panels are used, a steel post shall be placed every 4' to reinforce panels. Fence shall be maintained to prevent livestock and wildlife from entering the area until pit is reclaimed.
2. Storage tanks must be on the pad and surrounded with a dike and trench sloped to the reserve pit.
3. If cuttings pit contains any fluids during active drilling, it shall be netted to prevent the entry of migratory birds and other wildlife.

4. If cuttings pit contains any fluids, a minimum of 2 feet of freeboard shall be maintained in the pit.
5. The pit shall be lined with a minimum 12 millimeter impermeable synthetic liner and permeability $< 10^{-7}$ cm/sec; resistant to UV, weathering, chemicals, punctures, and tearing; and be placed on bedding material if bedrock is abrasive. The liner shall be installed in accordance with the manufactures requirements on material that will not tear or puncture the liner.
6. All pressure control equipment shall be in compliance with Onshore Order # 2 for a 5M system.
7. If H₂S is encountered in excess of 100 ppm in the gas stream, the operator shall immediately ensure control of the well, suspend drilling ahead operations (unless detrimental to well control), and obtain materials and safety equipment to bring the operations into compliance with applicable provisions of Onshore Order No. 6. The operator shall notify the authorized officer of the event and the mitigating steps that have or are being taken as soon as possible, but no later than the next business day.

C. Pit reclamation:

- a. If cuttings pit contains fluids and active drilling is not occurring, operator shall reclaim pit immediately upon cessation of drilling operations or shall net the entire pit to prevent the entry of migratory birds and other wildlife until the pit is reclaimed.
- b. All pit(s) shall be emptied of all fluids within 90 days after completion of drilling operations.
- c. The pit may not be cut or trenched.
- d. The pit material shall be covered with a minimum of 3 feet of overburden. The pit shall be closed properly to assure protection of soil, water, and vegetation.

D. Waste Disposal:

1. Any materials classified as nonexempt hazardous wastes shall be disposed of in an EPA approved facility.
2. Burning of materials or oil is not allowed.

2. Verbal Notifications

The following notifications shall be made to the BLM, Miles City Field Office (MCFO) (406) 233-2800, or after business hours to the appropriate individual's home phone shown on the list attached.

- A. Notify this office verbally at least 48 hours prior to beginning construction.
- B. Notify this office verbally at least 12 hours prior to spudding the well (to be followed up in writing within 5 days).
- C. Notify this office verbally at least 12 hours prior to running any casing or conducting any BOP tests (to be followed up in writing within 5 days).

- D. Notify this office verbally at least 6 hours prior to commencing any DST test.
 - E. Notify this office verbally at least 24 hours prior to plugging the well to receive verbal plugging orders.
 - F. Notify this office verbally at least 24 hours prior to removal of fluids from the reserve pit.
3. A complete copy of the approved Application for Permit to Drill (APD), including conditions, stipulations, and the H2S contingency plan (if required) shall be available for reference at the well site during the drilling phases. **A copy of the approved Surface Use Plan of Operations and Conditions of Approval (COAs) shall be provided to the surface owner(s) prior to initiating construction.**
 4. This drilling permit is valid for either two years from the approval date or until lease expiration, whichever occurs first.
 5. The abandonment marker shall exhibit the same information required for the well sign. The abandonment marker (steel plate welded to surface casing 4' below ground level) shall be installed when the well is plugged.
 6. The operator shall be responsible for obtaining all necessary authorizations and permits related to conducting operations for the proposed well.
 7. Additional requirements may be imposed if changes in operational and/or environmental conditions dictate.
 8. This office shall be notified in writing if the well pad has been constructed but no drilling operations have been initiated within 6 months of the construction.
 9. If any cultural values (sites, artifacts, human remains, etc.) are observed during operation of this lease/permit/right-of-way, they are to be left intact and the Miles City Field Office notified. The authorized officer will conduct an evaluation of the cultural values to establish appropriate mitigation, salvage or treatment. The operator is responsible for informing all persons in the area who are associated with this project that they will be subject to prosecution for knowingly disturbing historic or archaeological sites, or for collecting artifacts. If historic or archaeological materials are uncovered during construction, the operator is immediately to stop work that might further disturb such materials, and contact the authorized officer (AO). Within five working days, the AO will inform the operator as to:
 - A. whether the materials appear eligible for the National Register of Historic Places;
 - B. the mitigation measures the operator will likely have to undertake before the site can be used (assuming in situ preservation is not necessary); and,
 - C. a timeframe for the AO to complete an expedited review under 35 CFR 800.11 to confirm, through the State Historic Preservation Officer, that the findings of the AO are correct and that mitigation is appropriate.

If the operator wishes, at any time, to relocate activities to avoid the expense of mitigation and/or the delays associated with this process, the AO will assume responsibility for whatever recordation and stabilization of the exposed materials may be required. Otherwise, the operator will be responsible for mitigation costs. The AO will provide technical and procedural guidelines for the conduct of mitigation. Upon verification from the AO that the required mitigation has been completed, the operator will then be allowed to resume construction.

You have the right to request a State Director Review of this decision and these Conditions of Approval pursuant to 43 CFR 3165.3(b). An SDR request, including all supporting documentation must be filed with the Montana State Office, State Director (MT-920) at 5001 Southgate Drive, Billings, Montana 59101-4669 within 20 business days of your receipt of this decision. If adversely affected by the State Director's decision, it can be further appealed to the Interior Board of Land Appeals (IBLA) pursuant to 43 CFR 3165.4, 43 CFR 4.411, and 43 CFR 4.413. Should you fail to timely request an SDR, or after receiving the State Director's decision, fail to timely file an appeal with IBLA, no further administrative review of this decision will be possible.

INFORMATIONAL NOTICE

This is not a complete list of requirements, but is an abstract of some major requirements.

1. General Requirements

- a. The lessee or designated operator shall comply with applicable laws and regulations; with the lease terms, Onshore Oil and Gas Orders; NTL's; and with other orders and instructions of the authorized officer. Any deviation from the terms of the approved APD require prior approval from BLM (43 CFR 3162.1(a)).
- b. If at any time the facilities located on public lands authorized by the terms of the lease are no longer included in the lease due to a lease or unit boundary change) the BLM will process a change in authorization to the appropriate statute. The authorization will be subject to appropriate rental, or other financial obligation determined by the authorized officer.

2. Drilling Operations (Onshore Order No. 2)

- a. If DST's are run, all applicable safety precautions outlined in Onshore Order No. 2 shall be observed.
- b. All indications of usable water (10,000 ppm or less TDS) shall be reported to the Miles City Field Office prior to running the next string of casing or before plugging orders are requested, whichever occurs first.

3. Well Abandonment (43 CFR 3162.3-4, Onshore Order No. 1 - Sec. V)

Approval for abandonment shall be obtained prior to beginning plugging operations. Initial approval for plugging operations may be verbal, but shall be followed-up in writing within 30 days. Subsequent and final abandonment notifications are required and shall be submitted on Sundry Notice (Form 3160-5), in triplicate.

4. Reports and Notifications (43 CFR 3162.4-1, 3162.4-3)

- a. Within 30 days of completion of the well as a dry hole or producer, a copy of all logs, core descriptions, core analyses, well-test data, geologic summaries, sample descriptions or data obtained and compiled during the drilling, workover, and/or completion operations shall be filed with a Completion Report (Form 3160-4), in duplicate.
- b. In accordance with 43 CFR 3162.4-3, this well shall be reported on the Oil and Gas Operations Report (OGOR, MMS-4054), starting with the month in which drilling operations commence, and continuing each month until the well is physically plugged and abandoned.
- c. Notify this office within 5 business days of production start-up if either of the following two conditions occur:
 - (1) The well is placed on production.
 - (2) The well resumes production after being off of production for more than 90 days. "Placed on production" means shipment or sales of hydrocarbons from temporary tanks, production into permanent facilities or measurement through permanent facilities.

Notification may be written or verbal with written follow-up within 15 days, and must include the following information:

1. Operator name, address, and telephone number.
 2. Well name and number, county and state.
 3. Well location, "¼¼", Section, Township, Range, P.M."
 4. Date well begins or resumes production.
 5. The nature of the well's production; that is crude oil, or crude oil casing gas, or natural gas and entrained liquid hydrocarbons.
 6. The Federal or Indian lease number.
 7. As appropriate, the Unit Agreement name, number and Participating Area name.
 8. As appropriate, the Communitization Agreement number.
- d. As per Onshore Order No. 6, A.2.b., the "operator shall initially test the H₂S concentration of the gas stream for each well or production facility..." Submit the results of this test within 30 days of filing Form 3160-4, "Well Completion or Recompletion Report and Log".
5. Environmental Obligations and Disposition of Production (43 CFR 3162.5-1, 3162.7-1 and 40 CFR 302-4)
- a. With BLM approval, water produced from newly completed wells may be temporarily stored in reserve pits up to 90 days. During this initial period, application for the permanent disposal method shall be made to this office in accordance with Onshore Order No. 7. If underground injection is proposed, an EPA or State permit shall also be obtained. If surface discharge of produced water is proposed, an MPDES permit shall also be required.
 - b. Spills, accidents, fires, injuries, blowout and other undesirable events shall be reported to this office within the timeframes in NTL-3A.
 - c. You are required to take all necessary steps to prevent any death of a migratory bird in pits or open vessels associated with the drilling, testing, completion, or production of this well. The death of any migratory bird found in such a pit or open vessel is a violation of the Migratory Bird Treaty Act and is considered a criminal act. Any deaths of migratory birds attributable to pits or open vessels associated with drilling, testing, completing or production operations must be reported to this office and the United States Fish and Wildlife Service within 24 hours.
- We may require that the pit be designed or the open vessel be covered to deter the entry of birds in any facility associated with drilling, testing, completion or production of this well. Fencing, screening and netting of pits may be required as a means to deter bird entry. These conditions would most likely be imposed to prevent the entry of migratory birds if oil is left in pits or open vessels after the cessation of drilling or completion of operations, if water disposal pits consistently receive oil, or if pits or open vessels are used repeatedly for emergency situations which result in the accumulation of oil.
- Voluntary pit fencing, screening and netting, or sealing vessels, is encouraged to avoid potential instances that may result in the death of a migratory bird.
- d. Gas produced from this well may not be vented or flared beyond an initial, authorized test period of

30 days or 50 MMCF following its completion, whichever first occurs, without the prior, written approval of the authorized officer. Should gas be vented or flared without approval beyond the test period authorized above, you may be directed to shut-in the well until the gas can be captured or approval to continue the venting or flaring as uneconomic is granted, and you shall be required to compensate the lessor for that portion of the gas vented or flared without approval which is determined to have been avoidably lost.

6. Well Identification (43 CFR 3162.6)

Each drilling, producing or abandoned well shall be identified with the operator's name, the lease serial number, the well number, and the surveyed description of the well (either footages or the quarter-quarter section, the section, township and range). The Indian lessor's name may also be required. All markings shall be legible, and in a conspicuous place.

7. Site Security (43 CFR 3162.7.5)

- a. Oil storage facilities shall be clearly identified with a sign, and tanks must be individually identified (43 CFR 3162.6(c)).
- b. Site security plans shall be completed within 60 days of production startup (43 CFR 3162.7-5(c)).
- c. Site facility diagrams shall be filed in this office within 60 days after facilities are installed or modified (43 CFR 3162.7-5(d)(1)).

8. Public Availability of Information (43 CFR 3100.4)

All submitted information not marked "CONFIDENTIAL INFORMATION" will be available for public inspection upon request.

Thank you for your cooperation. If you have any questions, please contact a member of our staff at 406-233-2800, or at home, after business hours as shown on the attached list.

Sincerely,



For Todd D. Yeager
 Field Manager
 Miles City Field Office

BUREAU OF LAND MANAGEMENT, MILES CITY FIELD OFFICE
ADDRESS AND CONTACTS:

ADDRESS: 111 Garryowen Road, Miles City, Montana 59301
PHONE: (406) 233-2800
BUSINESS HOURS: 7:45 A.M. to 4:30 P.M. (Mountain Time)

<u>Title</u>	<u>Name</u>	<u>Home Phone</u>
Authorized Officer (Manager – Division of Minerals)	David Breisch Cell	(406) 852-3511 (406) 853-2801
Petroleum Engineer	Paul Helland	(406) 951-4550
Supervisor –Natural Resource Specialist	Dan Benoit	(406) 234-7153
Natural Resource Specialist	Jon David	(406) 234-9156
Natural Resource Specialist	Rick Lang	(406) 232-6095
Natural Resource Specialist	Dan Fox Cell	(406) 234-0209 (406) 853-4209
Natural Resource Specialist	Irma Nansel	(406) 234-8981
Petroleum Engineering Technician	Chris DeVault Cell	(406) 234-0784 (406) 853-3643
Petroleum Engineering Technician	Dennis Hutchings Cell	(406) 234-5460 (406) 853-1750
Petroleum Engineering Technician	Brian Nansel Cell	(406) 234-8981 (406) 853-2840
Petroleum Engineering Technician	Brian Hubbell Cell	(406) 234-1667 (406) 852-0078