ENVIRONMENTAL ASSESSMENT
PGS (Petroleum Geo-Services) Onshore, Inc.
Marianne 3-D Geophysical Exploration Project

November 2008

MISSION STATEMENT

It is the mission of the Bureau of Land Managment to sustain the health, diversity, and productivity of the public lands for the use and enjoyment of present and future generations.

BLM/WY/PL-09/012+1320

WY040-EA-0G08-05

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PGS Onshore, Inc.
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Environmental Assessment

1.0 INTRODUCTION

PGS Onshore, Inc. (the proponent), on behalf of Samson Resources, filed a Notice of Intent (NOI) with the Bureau of Land Management (BLM) Rock Springs Field Office (RSFO) on May 19, 2008, to conduct three-dimensional (3-D) geophysical exploration in the Horsethief Canyon and Bitter Creek area (Marianne 3-D Project) on federal, state, and private lands in Sweetwater County, Wyoming, hereafter referred to as the proposed action. The project area covers approximately 59.37 square miles or slightly less than 38,000 acres. The proposed action is needed to effectively evaluate hydrocarbon reserves underlying the project area for further development of oil and gas resources.

1.1 PURPOSE AND NEED FOR THE PROPOSED ACTION

A majority of federal minerals within the project area have been leased for oil and gas development or are available for lease. The purpose for this action is to consider a geophysical proposal on public lands managed by BLM. The proponent requires the permit to determine whether oil and gas lease within the proposed area contain hydrocarbons. The need for this action has been established under Minerals Leasing Act 1920 and regulations contained in 43 CFR 1350.

Decisions to be made by the BLM are whether impacts are significant; if impacts are not significant; and whether to issue a permit.

1.2 CONFORMANCE WITH APPLICABLE LAND USE PLANS

The proposed action is subject to the Green River Resource Management Plan (Green River RMP) Record of Decision (ROD) approved on August 8, 1997 (BLM 1997). Management objectives and actions for geophysical exploration are found on page 15 of the Green River RMP ROD, Geophysical Exploration.

The objective for management of geophysical exploration activities is to provide an opportunity for exploration of mineral resources and collection of geophysical data, while protecting other resource values.

Management actions for geophysical exploration allow for site-specific authorizations for off-road vehicle use, subject to appropriate limitations to protect various resources identified during analysis of proposed actions (BLM 1997). The development of this project will not affect the achievement of the Wyoming Standards for Healthy Rangelands. The Overland Trail on federal lands will be avoided by eliminating surface disturbing activities within 300 feet of contributing or unevaluated segments of trail.

2.0 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

2.1 PROPOSED ACTION

The proposed action is a 3-D geophysical exploration project on federal, state, and private lands in Sweetwater County, Wyoming. The project area covers approximately 59.37 square miles, or slightly less than 38,000 acres. Of the total area, approximately 25.58 square miles (43%) are administered by the BLM, 2.25 square miles (3%) by the State of Wyoming, and 32.17 square miles (54%) are privately owned by either the Rock Springs Grazing Association or Anadarko (Figure 1).

The southeast corner of the proposed project area starts approximately at the northeast boundary of the Rock Springs airport. Interstate Highway 80 (I-80) traverses the project area, entering in the southwest corner of the survey and exiting at the northeast corner of the project area; the project area is otherwise accessible by a few unimproved roads. The legal description of the public lands portion of the project is: T. 20 N., R. 102 W. Sections 18, 20, 22, 26, 28-NW1/4, N1/2NE1/4, S1/2SE1/4, 30, 32, and 34; T. 20 N., R. 103 W. Sections 14, 16, 20, 22, 24, 26, 28, 32, and 34; T. 19 N., R. 102 W. Sections 2, 4, 6, 8, 10, 14, 16, 18, 20, and 22; T. 19 N., R. 103 W. Sections 2, 4, 8, 10, 12, and 14, 6th Principal Meridian (Figure 1). Portions of the project that are on private or state lands are not subject to BLM authorization.

The proposed action is requested to begin on November 5 2008, and continue through December 5, 2008. The project can be up to 33 days with overlap of 15 days to drill. Initiation and completion of the proposed action is subject to a limited period based on various environmental and land use restrictions that allow the project to continue later on BLM-administered lands, but may require increased mitigation measures. Those increased mitigation measures are incorporated into the proposed action.

The proposed action consists of a cable telemetry system oriented in a northwest-southeast direction. Seismic receiver (detector) lines are usually between one and seven miles long, with a total of 51 lines, and 10,131 receiver points. The receiver lines transect the grid diagonally across a southwest-northeast rectangular. Each detector line consists of individual detector groups spaced 165 feet apart, with the interval between detector lines approximately 990 feet. Distance from the first detector to the last usually is between one and seven miles. The energy source lines are oriented northwest-southeast and are spaced at intervals of 990 feet, and each source line is segmented into groups of six source locations spaced 174 feet apart (Figure 1). These 50 source lines have 10,167 source points. There are 2,118 dynamite points and 6,534 vibroseis points. The depth of the shot holes will be 60 feet. In areas of rough terrain in the southeast corner the shot holes will be 40 feet with 10 pounds of pentolite and dual capped.

New technology allows for the development of a higher-definition survey, referred to as 3-D. With large concentrations of receivers and energy source points laid out in a grid pattern, data collected from current 3-D geophysical exploration operations more accurately depict the subsurface reservoir's structural geology and provide more detailed and quantitative information about the reservoir.

The general technique of the proposed geophysical exploration is referred to as the seismic reflection method. Acquisition of seismic exploration data involves the synthetic generation of seismic waves and their subsequent detection after passing through or reflecting off the region of interest (i.e., the "target"). A reflection seismic survey typically involves generating hundreds to tens of thousands of seismic source events at established locations in the survey area. The seismic energy generated at each source is detected and recorded at a variety of distances from the source location.

To effectively generate 3-D seismic data, geophones (receiver points) are placed in a grid pattern with multiple source points. Force waves are generated by explosive charges or specially designed "thumper" vehicles which are collected by the receivers and used to generate models of the sub-surface geological structures. Accuracy of the models requires a broad-based approach involving a wide study area incorporating hundreds of receivers and source points. Geophones and hydrophones, generically referred to as receivers, are used to transform ground movement into an electrical voltage that can be recorded. Geophones along receiver lines collect the signals for four seconds and are linked to a recording truck. Receiver lines mark the position of geophones and connected by cables laid along the alignments. For every source event, each receiver generates a seismogram, or trace, which is a time series representing the earth's movement at the receiver location. Each trace has a reference time of zero, corresponding to the time of its source event. A record of all traces for each source point is usually written to a medium such as magnetic tape for subsequent study, including processing, display, and interpretation.

INSERT **Figure 1. Project Location**

Survey will be done with GPS packs and the use of 8 Kubotas and OHV quads. The receiver points and source points will be painted on the ground with biodegradable paint. Each surveyor will create a "bread crumb" trail that will be put on the map as well as loaded on each GPS unit the crew is using to show where the access and lines are. All shot points on the program will utilize a different symbol on the map to show the difference between vibrator points and dynamite points.

Vibrator buggies (thumper trucks) are four-wheel-drive off-road buggies equipped with low-pressure (4 psi) sand tires that are four foot across with half inch tread. At each source location, the pads of three vibrating buggies are lowered to the ground to create seismic waves that are recorded by surface recording equipment. A single pass by one set of three vibrator buggies would be made along each source and access route, conditions permitting. The thumpers would stagger their tracks to minimize impacts. Unless priorities dictate otherwise, operations will commence in the northwest portion of the project area and advance toward the southeast. When the vibrations are generated, acoustic energy is transmitted through the earth, and then reflected by subsurface geologic layers to the receiver points. In areas where it is ineffective for 3-D seismic thumper trucks to be used; dynamite operations will be used with buggy type drills (IVI or Arco) to transverse the grid. The drills will follow the marked lines on a GPS unit and flagging in rough terrain.

Buggy Type Drills (IVI or Arco) method is the proposed method for generating seismic data in areas of unusually steep and/or rugged terrain that would be inaccessible to the off-road thumper truck buggies. The buggy drills are tractor-like vehicles that articulate in the middle. These buggy drills are smaller than thumper trucks. The buggy drills will follow the marked lines on the GPS units as well as the flagging in rough terrain. This method uses explosive blasts at source points to generate seismic energy. Source point shot holes are drilled with air drills to 40 feet, will have 10 lbs of pentolite, and will later be backfilled with natural cuttings. The bottom plug will be inserted in the hole and back filled again with three feet natural cuttings. The second plug is inserted and filled to surface with the rest of the natural cuttings. In case the terrain does not permit safe operations for the buggy drills; Heli-rigs will be used in their place with the same loading.

The Helicopter Drilling Shot Hole (Explosive) method is proposed as a method for generating seismic data in areas of unusually steep and/or rugged terrain that would be inaccessible to the off-road buggies. This method uses explosive blasts at source points to generate seismic energy. Source point shot holes are drilled with heli-portable drills to 40 feet, loaded with explosives, then repacked with drill spoil same as above Buggy Method. To use this method, a helicopter would transport portable drills to each source-point location, and all layouts, pickup, and troubleshooting would be accomplished on foot with helicopter support, limiting the need for off-road vehicle travel. Heli-portable drill units are small and lightweight and produce much less torque than larger, heavier drills. It is estimated that each heli-portable unit would be capable of drilling 20 holes per day based on the substrate present in the project area.

The proposed field operations will be helicopter assisted. Appropriate helicopter landing zones would be positioned at previously established sites within the project area and would be utilized for operations staging and support on private lands. Staging areas that would allow for a helicopter landing, including equipment deployment, the helicopter and vehicle fuel storage would be located on various designated locations throughout the project area. These areas generally measure 200 feet by 200 feet, which results in a 0.9-acre temporary disturbance area. Aviation fuel and lubricants are secured at pre-determined locations where they are stored in approved containers. Equipment will be positioned by helicopter and personnel would traverse on foot from the nearest access point to the pre-positioned equipment.

Traffic along receiver lines crossing BLM-administered land will be restricted to personnel on foot or in helicopters to reduce potential impacts along the receiver lines. No truck or all-terrain vehicles will be used along receiver lines. Buggy traffic will be on every other receiver line that was culturally cleared. Equipment will be deployed by helicopter and the line crew will be laying out cables on foot. Landing

areas will be positioned at established sites (private) within the project area and also are used for equipment staging.

Equipment that may be used for the proposed action includes, but is not limited to: crew cab trucks (support/crew transfer); a recording instrument truck; a crew van; twelve pickup trucks; stake bed trucks (personnel and equipment transport);four service (fuel/tech.) truck; OHV quads; van trailers (equipment transport/battery charging); a flat-deck trailer (equipment transport); trailers (OHV transport); a support helicopter; a fuel trailer; a support vehicle; a recording system including boxes, batteries, cables, and geophones; and 6 AHV4 articulating buggy-mounted vibrators and 2 spares.

The area of potential effect (APE) within the project area includes all areas needed to access source and receiver lines using on-road and cross-country travel by heavy vehicles, including access routes and drive-arounds where source lines may be difficult to access or where sensitive resources exist. Potential ground-disturbing activities include cross-country travel by vibrator vehicles, and helicopter and other equipment staging areas. Other potential disturbance includes travel by OHVs, support vehicle travel, and pedestrian movement along the alignments.

Potential effects to cultural resources by the proposed Marianne 3-D will be consulted upon with the Wyoming State Historic Preservation Officer according to the current Protocol Agreement between the BLM and the State of Wyoming. All federally owned public lands where there is a potential to affect historic properties have been inventoried. Private and State lands were examined through a records search of the Wyoming Cultural Records Office and BLM Rock Springs Field Office files. All cultural resources which are determined as eligible or are left unevaluated will be avoided by a minimum of 100 feet. The Overland Trail on federal lands will be avoided by eliminating surface disturbing activities within 300 feet of contributing or unevaluated segments of trail. For federal lands potential visible impacts will be eliminated by adoption of sinuous "snail trail" approaches to the source points. Within private and state owned lands, eligible or contributing components of this trail will be avoided by a minimum of 100 feet. All historic structures and rock art which are determined eligible or left unevaluated will be avoided by shot holes by a minimum of 140 feet.

To date reports for roughly one-half of the inventoried area have been submitted to the BLM for review. No sites of apparent Native American cultural or religious importance have been reported. Should such sites be present in the remaining portions of the project, appropriate tribes will be consulted to assist with the evaluation of significance and impacts or all surface-disturbing activities within one-quarter mile of the site(s) will be dropped from the project. Adoptions of these measures will assure that the project has no adverse impacts to cultural resources.

2.2 NO ACTION ALTERNATIVE

Under the No Action Alternative, the geophysical exploration project will not be authorized on BLM-administered lands, which are approximately 43% of the project area. Operations could still occur on state and private lands. Considering that BLM-administered lands are a large portion of the project area with landownership in a complex "checkerboard" pattern, the effective use of 3-D vibroseis methods without federal lands will not be possible. Adoption of this alternative effectively results in cancellation of the project. The lack of seismic information will result in increased surface disturbance in the development of the field.

2.3 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM THE STUDY

Exploratory Drilling

Exploratory drilling is an alternative to collecting and analyzing data. Exploratory drilling was the preferred method of locating oil and gas reserves before the development of 2-D and 3-D seismic technologies that image the subsurface geology of an area and identify potential oil and gas reservoirs. Exploratory wells typically are less successful, more costly, and can have greater environmental impacts (e.g., more wells are required to develop a given resource) than wells based on higher-quality seismic data. Based upon the demonstrated environmental impacts and increased costs, exploratory drilling was not considered a viable alternative for accomplishing the project objectives.

3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

The following subsections describe the affected environment and anticipated environmental consequences to the private, state, and public lands. Because the BLM has no jurisdiction over geophysical operations on state or private lands, any mitigation developed through the analysis applies only to public lands administered by the BLM.

3.1 LOCATION AND GENERAL SETTING

The Marianne 3-D project area consists of a 59.37 square mile area in Sweetwater County, Wyoming. The landscape consists of open range vegetated with sagebrush and native grasses. The topography is rolling hills at the center of the project area with steep bluffs on the east and southwest portions of the site. I-80 and the Union Pacific Railroad traverse the project area from southwest to northeast. Unimproved dirt roads and two-track roads are limited within the project area. See Figure 1 to see the geographic area affected by the proposed action.

3.2 FLIUD MINERALS: OIL AND GAS

Environmental Consequences of the Proposed Action

Implementation of the proposed action would allow project proponents to obtain and use 3-D geophysical data, resulting in the greater likelihood of drilling producing wells, more efficient field development, and being consistent with the National Energy Policy.

Exploratory drilling for fluid minerals is not dependent upon geophysical operations. However, such operations can indicate areas in which to concentrate future exploratory drilling, and would likely reduce surface disturbance for nonproductive wildcat wells. Public lands in the project area are leased for oil and gas, and it is expected that some exploratory drilling would occur on all lands. Should exploratory drilling locate commercial quantities of hydrocarbons, development wells could occur. The extent of future development is unknown at this point; any future proposals for individual exploratory wells and/or development wells would be analyzed at that time.

Operations near existing oil and gas wells, buried pipelines, buried telephone cables, or overhead power lines could cause transmission interference. With implementation of the safe distance prescriptions below, no significant impact to oil- and gas-related facilities is foreseen.

Affected Environment/ No Action Alternative

Currently, minimal active drilling occurs in the Marianne 3-D project area. Within the project boundary, 20 plugged and abandoned wells and four flowing gas well are present (Wyoming Oil and Gas Conservation Commission 2006). Existing oil and gas pipelines are present in the northern portion of the

project area. Existing wells and pipelines are considered avoidance areas for the Marianne 3-D project (Figure 2). Adoption of the No Action Alternative is likely to result in drilling more wildcat exploratory wells and possibly dry holes than might occur following completion of the proposed geophysical project. Dry holes, in addition to being a financial loss, would result in greater surface disturbance caused by construction of well pads and roads.

3.3 SOILS

Affected Environment/No Action Alternative

The project area is dominated by loamy mixed frigid shallow soils. Soils across the area all have the characteristics of poor, shallow development, making them moderately erodible, especially in areas of steep slopes (greater than 20%) (BLM 2006b).

Most of the soil in the project area has developed from residuum, or direct weathering, of the underlying formations. The primary process of sediment movement across this landscape is slope wash, although other alluvial and colluvial processes have transported sediments. The soils most sensitive to disturbance are those developed from bedrock and occurring on areas of steep slopes.

Representative soils in the project area include those listed in Table 2 and illustrated in Figure 3.

Table 2: Soils Found in the Marianne 3-D Project Area

Description	Erodibility
Loamy, mixed (calcareous), frigid, shallow	Moderate
Fine-silty, mixed (calcareous), frigid	Moderate
Loamy-skeletal, mixed	Low
Fine-loamy, mixed	Moderate

Sources: U.S. Forest Service 2003; BLM 2006a

Environmental Consequences of the Proposed Action

Impacts to soils in the form of compaction and subsequent erosion could occur, principally by ORV traffic. Compaction reduces capacity for soils to absorb water and causes increased runoff. Operation of ORV would crush, and to a lesser extent break off, much of the aboveground vegetation, but root masses of grass and forbs would remain alive and intact and continue to hold soil in place thereby reducing or avoiding erosion. By offsetting individual vehicle drive paths (see Appendix B, Conditions of Approval), soil compaction, erosion, and vegetation damage, would be minimized. Consequently, compaction and soil erosion on level and gently sloping surfaces is anticipated to be negligible.

Traversing areas with relatively steep gullies and terrain could result in increased erosion and soil impacts. The areas most sensitive to erosion are those occurring on the western edge of the project area, where steep slopes are combined with moderately erodible loamy, frigid, mixed shallow soils. To protect soils, existing BLM standards limit surface disturbance on slopes greater than 25%. With implementation of the slope restrictions, the project should cause minimal impacts.

Insert Figure 2. Existing Wells, Pipelines and Roads

Impacts to soils may also occur as a result of surface rutting caused by vehicle operations on wet soils. Existing BLM standards call for closure during such conditions. With implementation of the saturated soil restrictions in Appendix B, the project should not result in significant impacts to wet soils.

The soils most sensitive to disturbance are those developed from bedrock or glaciated bedrock and occurring on areas of steep slopes.

3.4 WATER RESOURCES

Environmental Consequences of the Proposed Action

Leaving the riparian vegetation community intact helps both to minimize the level of disturbance and aid the recovery process. The knowledge gained from the seismic survey should help to reduce the long-term level of disturbance in the area as the mineral reserves are developed. Following implementation of Operator Committed Measures and other best management practices (BMPs) outlined in this and other pertinent documents is expected to minimize environmental impacts associated with this project. Since vehicular stream crossings are authorized only at existing crossing locations, and the operators are committed to limiting all project activity to remain outside the 500-foot buffer zone of all riparian and wetland areas, 100 feet from the inner gorge of ephemeral channels, and 1,320 feet from seeps and springs unless authorized in advance by BLM. No adverse effect to existing water quality is anticipated.

Adherence to these mitigation practices should result in an action that would not deplete or degrade the water resource.

Affected Environment/No Action Alternative

The Marianne 3-D Project is located in the Bitter Creek watershed. The Bitter Creek and its tributaries, including Salt Wells Creek and Horse Thief Canyon, are the main channels that flow through the project area. These channels are characterized by deep soiled vegetation-controlled, fine-sediment systems with occasional rock outcrops. Bitter Creek presently has a sizeable drop in channel level that is being held by a diversion structure on private land on T. 20 N., R. 103 W., Section 31.

Both Salt Wells and Bitter Creek are considered perennial streams. Both of these streams and Horse Thief Canyon, as well as some of their larger tributaries, are characterized by a wide floodplain incised by steep-walled banks cut through fluvial deposits. The majority of secondary streams in the project area are listed by National Wetlands Inventory as intermittent riverine, defined as a "channel [that] contains flowing water for only part of the year" (Cowardin et al. 1979). Wetlands and Riparian Areas are primarily associated with these and other secondary channels that contain perennial, intermittent, and ephemeral flows. The Superior Recharge Area is located outside of the project area.

As with all wetlands under federal jurisdiction, multiple regulations are associated with bodies of water and wetland management, including Section 404 of the Clean Water Act and Executive Orders 11990 (wetland protection) and 11988 (floodplain management). The Green River RMP specifies stipulations to protect all riparian areas, including those associated with Bitter Creek and Salt Wells Creek from sedimentation and for the protection of riparian vegetation, including

requirements by establishing a 500-foot buffer from the edge of riparian areas and 100 feet from the inner gorge of ephemeral channels for permanent structures and as an avoidance area for surface disturbing activities. Any seeps and springs within or within ¼ mile of the project area would be buffered by a 1,320-foot (1/4 mile) no disturbance buffer, as shown in Figure 3.

3.5 VEGETATION

Environmental Consequences of the Proposed Action

The proposed Marianne 3-D project involves direct surface impacts to approximately 38,000 acres of land. During previous geophysical projects, woodier plants in the vehicle paths were impacted, but more tender and resilient grasses and forbs survived and continue to occupy the vehicle paths. Brush kill is dependent on multiple factors, including brush type, amount of traffic, time of year, and moisture conditions. Geophysical projects conducted under snow and frozen-ground conditions typically leave little to no visible trace, killing less than 5% of the brush that is driven on. Based on observation of past summer/fall 3-D projects in areas of the relatively tall mountain and basin big sagebrush, however, approximately 60% of the sagebrush driven over is killed, another 20% is partially killed or "pruned," and the remaining 20% is undamaged. In environments where relatively low blacksage and Gardner's saltbush (*Atriplex gardneri*) predominate, brush kill by dry season projects is less, with only approximately 40% of low shrubs in drive paths killed and another 20% partially killed or damaged. Relatively low-growing sage and Gardner's saltbush communities predominate in the subject project area, with the taller basin big sagebrush confined to small areas of deeper soils and greater available moisture such as on floodplains. The proposed period of project field operations during the fall/winter would occur during dry/frozen weather conditions. Areas with a large percentage of rabbitbrush (*Chrysothamnus spp*.) should see little effect as this species sprouts readily.

Vehicle impacts to grasses and forbs are anticipated to be even shorter term in effect since these species are not killed and would resprout from their established root systems. If project operations are conducted during the dry fall and winter seasons, the remaining grass in the vehicle paths could be broken off, and regrowth is not anticipated until the spring. Seasonal dry grass and forb loss within the impact area is not expected to be significant. Overall, with side-by-side vehicle travel paths (see approval conditions for visual resources) limited to areas of less than 25% slope (see approval conditions for soils), Marianne 3-D vehicle traffic impacts to the general vegetation are expected to be minimal for the following reasons: impacts are limited to species composition changes (not vegetation removal/dirt work), species composition changes occur on a maximum of only 4.3% of the project area, species composition shifts would involve only a proportion change among existing native plants (no introduced species), and species composition changes is short term as new brushy plants begin to reoccupy the vehicle paths within a few years.

Affected Environment/No Action Alternative

Landsat imagery showed 13 vegetation types within the project area (BLM 2006c). Mixed-shrub occupies 26,584 acres (48%) of the project area. Mixed-shrub in the project area includes Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*), rabbitbrush (*Chrysothamnus* spp.), saltbush (*Atriplex* spp.), greasewood (*Sarcobatus vermiculatus*), and broom snakeweed (*Gutierrezia sarothrae*). Bare ground is the only other type to have greater than 8% coverage within the project area (8,317 acres, 15%). Mixed-shrub dominates the upland areas of the project area. The vegetation categories bare ground, greasewood, and desert shrub primarily occupy the remaining riparian and low-lying mesic zones.

Several species of sagebrush (*Artemisia* spp.), within the broad vegetation categories of desert shrub, mixed shrub, sagebrush grassland, and shrub-dominated riparian, dominate the vegetative composition in the project area. Secondary vegetation types include bare ground, grassland, greasewood, saltbush, and riparian-grass. Based on topography and elevation, Wyoming big sagebrush is the dominant shrub in the project area.

Insert Figure 3. Dominant Soils

Other common plant species include spiny hopsage (*Grayia spinosa*), winterfat (*Krasheninnikovia lanata*), needle-and-thread grass (*Hesperostipa comata*), thickspike Wheatgrass (*Elymus lanceolatus*) and western wheatgrass (*Pascopyrum smithii*).

3.6 SPECIAL STATUS PLANTS

Environmental Consequences of Proposed Action

No sensitive plant species are expected to be affected directly by the Proposed Action because any plants found to be present in the project area would be flagged to prevent any disturbance or loss of any individual. However, disturbance of suitable habitat for these species in the project area might reduce their potential for establishment or spread.

Affected Environment/No Action Alternative

Suitable habitat for sensitive plant species occurs in the project area, based on geology, topography, elevation, moisture regimes, and soil types. No sensitive species are known to be present in, or within two miles of, the project area although suitable habitat is present for mystery wormwood, Nelson's milkvetch, and Ownbey's thistle, described in Table 3.

Table 3: BLM Sensitive Plants that May Occur in the Project Area

Common Name	Scientific Name	Habitat	Potential to Occur in Project Area
Mystery wormwood	*Artemisia biennis* var. *diffusa*	Clay flats, playas; 6,500'	Low
Nelson's milkvetch	*Astragalus nelsonianus*	Clay flats, shale bluffs and gullies, pebbly slopes in sparsely vegetated sagebrush, juniper; 5,200-7,600'	Low
Ownbey's thistle	*Cirsium ownbeyi*	Shale slopes, sparsely vegetated sage, juniper; 6,400-8,400'	Low

3.7 NOXIOUS/INVASIVE PLANTS

Environmental Consequences of the Proposed Action

Noxious weeds might be introduced to the area by contaminated equipment. With implementation of the vehicle washing stipulation and integrated weed management techniques, no significant impact with regard to weeds is expected.

Weeds might invade and take hold in areas of surface disturbance caused by project operations. If reclamation and reseeding is undertaken promptly in any areas of unanticipated surface disturbance as prescribed, no significant impact to vegetation or weed occurrence is foreseen.

Affected Environment/No Action Alternative

A total of 22 noxious weeds, including invasive species, are of concern in Wyoming, six of which may be of concern in the project vicinity (BLM 1997). These weeds include Canada thistle (*Cirsium arvense*), musk thistle (*Carduus nutans*), black henbane (*Hyoscyamus niger*), halogeton (*Halogeton glomeratus*), hoary cress (whitetop) (*Cardaria spp.*), and perennial pepperweed (giant whitetop) (*Lepidium latifolium*). Occurrence of these weed species has a much higher probability in areas of past disturbance and varies

according to basic vegetative cover type. Because invasive and noxious plants are typically very aggressive, special management is required to prevent existing infestations from spreading (or to eradicate these infestations) and prevent the introduction of noxious weed seed from outside sources.

3.8 LIVESTOCK AND RANGE RESOURCES

Environmental Consequences of the Proposed Action

Leaving fences down or gates open when livestock are present might result in livestock moving between pastures or allotments, from private or state to public land or vice versa, onto highways, and herds mixing. This could lead to unauthorized grazing, overgrazing, or increased livestock operator cost associated with sorting mixed herds. With implementation of the fence and lessee notification measures prescribed below, the project should result in negligible impacts.

Seismic operations near water wells and pipelines or water impoundments might result in casing failure or dam fissure and a subsequent loss of livestock water. With implementation of the water restrictions prescribed below, the project should result in no significant impacts.

Heavy vehicle traffic could damage existing cattle guards. With implementation of the facilities repair/replacement responsibility measures prescribed, the project should result in no significant impacts.

The proposed action might result in short-term vegetative effects on a small percentage of the project area. This disturbance would consist primarily of conversion of an estimated 60% of the mature shrubs and forbs in the tire paths to grass and to younger, more succulent shrubs and forbs. While species and age composition of plants in the tire paths will change, available palatable livestock forage would not be appreciably affected. With side-by-side vehicle travel paths (see approval conditions for visual resources), livestock forage impacts are anticipated to be minimal.

Affected Environment/No Action Alternative

The proposed Marianne 3-D project area falls within the Rock Springs Allotment. The majority of livestock (cattle and sheep) grazing on the Rock Springs Allotment is limited to dormant season grazing (12/1-5/15). Some growing season, or season-long grazing occurs in the allotment by so called "in-holders." This use amounts to 8% of total permitted use in the allotment. Most the of the "in-holders" (owners of small parcels of land within the boundary of the allotment) area separate from the Rock Springs Grazing Association (RSGA); however, some areas also RSGA shareholders and as such, operate year-round or near year-round on the Rock Springs Allotment. The Marianne 3-D project area is not in an "in-holder" use area.

Under the No Action Alternative, the BLM would not select the proposed action. Because there would be no seismic exploration activities, no impacts to livestock/range resources would occur.

3.9 WILDLIFE AND SPECIAL STATUS ANIMAL SPECIES

3.9.1 Big Game Species

Big game species that inhabit the project area include mule deer and pronghorn, with limited use by elk. Areas of importance for big game mammals that occur in the project area include crucial winter, severe winter and winter-yearlong mule deer and pronghorn ranges (Figure 4). Crucial winter range is defined in the Green River RMP as those areas available, relatively intact, and winter most of the population at its objective in adequate body condition, eight or more years out of ten (BLM 1997). Moose are not known to use this area, although they may be present unpredictably as a transient. The project area does not include habitat for moose; therefore, it is not analyzed further in this document.

3.9.1.1 Mule Deer

Mule deer use habitat within the project area during much of the year. Two mule deer herd units are present within the project area with Interstate 80 being the dividing line between the Steamboat and South Rock Springs herd units. The Steamboat herd was 16% above the population objective of 4,000 animals in 2006, with the population expected to continue to increase. Winter-yearlong habitat for this herd is designated in the northeast portion of the project area.

The South Rock Springs herd was 47% below the population objective of 11,750 animals in 2006. Although well below objective, this herd has been slowly increasing since 2003. Winter-yearlong habitat for this herd is designated south of Interstate 80. No crucial winter habitat for either herd is designated within the project area, but the majority of the project area is used by mule deer all year. Refer to the RSFO GIS database for seasonal ranges and boundaries (BLM 2006e).

3.9.1.2 Pronghorn Antelope

Similar to mule deer, two pronghorn units are present within the project area with Interstate 80 dividing the two units. North of Interstate 80 is considered part of the Sublette pronghorn herd unit. This herd was 25% above the population objective of 48,000 animals in 2006 and has been increasing since 2001. This herd unit is quite large, however, and accurate population estimates are difficult to acquire. All designated habitat for this herd in the project area is crucial winter range. The project area is crucial winter range.

South of Interstate 80 is the Bitter Creek herd unit, which was 45% below the population objective of 25,000 animals in 2006. While it seems this herd may not reach its objective, at one time in the early 1990s this herd topped 25,000 pronghorns. This herd has traditionally had low productivity, and only when weather conditions were good was there a boost in fawn production. The accelerated pace of natural gas production has impacted habitat throughout the herd unit and drought conditions continue to stress the range (WGFD 2006). Designated habitat for this herd within the project area consists of severe winter and winter-yearlong ranges.

3.9.1.3 Elk

Two elk herds, the Petition and Steamboat herd units, occasionally occupy the project area but no designated seasonal habitat for the species is found within the project area. Though the project area does not contain crucial winter or yearlong elk range, the project area may be used by elk at various times of the year. Refer to the RSFO GIS database for seasonal ranges and boundaries (BLM 2006e).

Environmental Consequences of the Proposed Action on Big Game Species

Big game species will be displaced temporarily by project activities. Disturbance of big game species during the parturition period and on winter range can increase stress and may influence species distribution (Hayden-Wing 1980; Morgantini and Hudson 1980). The Proposed Action is required to complete activities on crucial winter ranges before the winter restriction dates for big game (November 15 through April 30). In the event severe winter weather conditions occur and big game species are utilizing the severe winter range, no activities would occur within that area from November 15 to April 30. Effects on big game are expected to be minimal, as the project would be conducted during fall on crucial winter ranges. No long-term habitat loss is expected once geophysical recording is complete, as big game species are expected to return to their historic ranges. No cumulative effects are anticipated. PGS may apply for an exception to the crucial winter range restriction to conduct geophysical activities after November 15. Any exceptions approved will be in accordance with the Green River RMP, Appendix 7 (BLM 1997).

Affected Environment/No Action Alternative

The project area includes sagebrush/saltbush steppe, greasewood, and riparian wildlife habitats. Shrubs growing in this area may include basin big sagebrush, Wyoming big sagebrush, greasewood, saltbush, and rabbitbrush. Other common plant species include spiny hopsage, winterfat, needle-and-thread grass, and western wheatgrass.

The most common large game animals found in the Marianne 3-D project area include pronghorn (*Antilocapra americana*) and mule deer (*Odocoileus hemionus*). Other common mammals that inhabit the project area include coyote (*Canus latrans*), American badger (*Taxidea taxus*), and various rodents, including white-tailed jackrabbit (*Lepus townsendii*), all of which generally inhabit uplands.

Nesting raptor species in or near the project area are ferruginous hawk (*Buteo regalis*), golden eagle (*Aquila chrysaetos*), prairie falcon (*Falco mexicanus*), red-tailed hawk (*Buteo jamaicensis*), and great horned owl (*Bubo virginianus*). The area also contains habitat for species designated by the BLM as sage-obligate species, which include greater sage-grouse (*Centrocercus urophasianus*), loggerhead shrike (*Lanius ludovicianus*), sage thrasher (*Oreoscoptes montanus*), Brewer's sparrow (*Spizella breweri*), and sage sparrow (*Amphispiza belli*). Reptiles that likely occur in the project area include Great Basin spadefoot toad (*Spea intermontana*), northern sagebrush lizard (*Sceloporus graciosus* spp. *graciosus*), greater short-horned lizard (*Phrynosoma hernandesi*), intermountain wandering gartersnake (*Thamnophis elegans* spp. *vagrans*), and prairie rattlesnake (*Crotalus virdis* spp. *viridis*). Wildlife discussed in greater detail in this environmental analysis include threatened, endangered, proposed and candidate species, big game species, raptors, and BLM sensitive species.

Information regarding the occurrence of species discussed in this analysis includes the BLM GIS database, Wyoming Game and Fish Department Wildlife Atlas (Cerovski et al. 2004), and the BLM biologist knowledge of the project area.

3.9.2 Fish

Bitter Creek and Salt Wells Creek flow through project area. Both are considered perennial streams. No populations of sensitive fish, including round-tailed chub (*Gila robusta*), leatherside chub ((*Lepidomeda copei*), bluehead sucker (*Catstomus discobulus*), or Colorado River cutthroat trout (*Oncorhynchus clarki pleuriticus*) have been identified by WGFD surveys in waters within the project area. However, flannelmouth sucker (*Catostomus latipinnis*) is present upstream of the project area in Bitter Creek and could occur within the project area at times.

Environmental Consequences of the Proposed Action on Fishes

No impacts to fisheries are anticipated from the proposed action as impacts to streams and depletions of water from those streams is unlikely.

Insert **Figure 4. Big Game Crucial Habitat**

3.9.3 Upland Game Birds

Upland game birds within the project area include greater sage-grouse (*Centrocercus urophasianus*) and mourning dove (*Zenaida macroura*). Greater sage-grouse is a BLM-sensitive species.

Mourning dove is a transient migrant in spring and fall; it probably occurs in the project area during the breeding season, but it is likely absent in winter. The Wyoming Game and Fish Department (WGFD) categorizes the mourning dove as an abundant species that occurs in all habitats under 8,500-foot elevation (Cerovski et al. 2004). Because this species is not expected to occur within the project area during the period of the Proposed Action, detailed analysis is not included.

3.9.3.1 Greater Sage-Grouse

Potential sage-grouse habitat is limited within the project area due to the rugged terrain on the eastern 2/3 portion of the project area and extensive white-tailed prairie dog towns on the remaining portion. Furthermore, both Interstate 80 and Union Pacific Railroad bisect the project area which can be an avoidance factor for sage-grouse (Connelly et al. 2004). The Wyoming Game and Fish Department identifies the closest active sage-grouse lek approximately 8 miles north of the project boundary. Possible sage-grouse use in this area would primarily occur during the winter; however, it is expected to be minimal.

Environmental Consequences of the Proposed Action on Upland Game Birds

No significant effects on the greater sage-grouse population are anticipated because of the limited amount of suitable habitat within the project area and authorized activities occur after nesting is complete and before winter. Potential effects on greater sage-grouse would include minor direct loss of winter habitat and forage and temporary disturbance due to project activities. Disturbance of greater sage-grouse during the nesting and brood-rearing period and on winter concentration areas could increase stress and influence species distribution. Some displacement of greater sage-grouse could be expected from vehicular and human activities associated with geophysical activities, although long-term adverse effects would likely be negligible.

3.9.4 Threatened, Endangered, Proposed, and Candidate Species

The U.S. Fish and Wildlife Service (USFWS), under authority of the Endangered Species Act, maintains lists of plant and animal species that have been classified as threatened or endangered, or are potential candidates for classification. One federally designated threatened, endangered, proposed, or candidate animal species are considered potentially present in the project area. Federally-listed Colorado River fishes do not occur in the project area, but they do occur downstream and would therefore be subject to potential effects from any water depletions in the project area. The status and potential effects to each of the species is provided in Table 4.

Table 4: Federally Listed Threatened, Endangered, Proposed, or Candidate Species and their Status in the Project Area

Species	Status	Status in Project Area/Comments
Black-footed ferret (*Mustela nigripes*)	Endangered	Prairie dog towns/ None known/ May effect

Sources: USFWS, 2006; BLM 2006a

3.9.4.14 Black-footed Ferret

Potential black-footed ferret habitat exists within the project area. Approximately half of the Marianne 3-D Geophysical project is included within the "block cleared" habitat for black-footed ferrets as stated by the USFWS (letter dated February 3, 2004). The letter states that the project area is exempt from surveying prairie dog towns for black-footed ferrets. Therefore, black-footed ferrets are not a concern in this section of the project area.

In the area of the project not considered block cleared by the USFWS, prairie dog towns were mapped in July 2008 (TRC 2008). Nocturnal surveys for black-footed ferrets were then conducted on these towns pursuant to 1989 USFWS survey guidelines (TRC 2008). This survey did not confirm any black-footed ferrets within the survey area. However, two unconfirmed sightings were reported as part of this project. These areas were surveyed for an additional three nights (six total nights) with no confirmed sightings.

Environmental Consequences of the Proposed Action on Threatened, Endangered, Proposed, or Candidate Species

With no confirmed black-footed ferret sightings but potential habitat present, the BLM has determined a '*may affect, not likely to adversely affect*' for black-footed ferrets. This determination was concurred by the USFWS on October 29, 2008. Furthermore, impacts to black-footed ferrets will be minimized by the 50-foot avoidance of white-tailed prairie dog burrows. In the event any black-footed ferrets or their sign are observed during construction, the Service recommends that the project be halted and the Service contacted as soon as possible. No effects to listed species of Colorado River fishes from water depletions will occur as a result of project activities.

3.9.5 BLM Sensitive Species

A number of animal species potentially present in the project area have been accorded "sensitive species" status (BLM 2008). Several BLM sensitive species potentially are present in the project area.

3.9.5.1 Raptors

BLM maps indicate the presence of seven ferruginous hawk (*Buteo regalis*) nests within the project area, as well as eleven nests outside the project area within two miles of the project border; ten golden eagle (*Aquila chrysaetos*) nests within the project area and thirteen within two miles of the project border; three great horned owl (*Bubo virginianus*) nest within the project area; six prairie falcon (*Falco mexicanus*) nests within the project area and nine within two miles of the project border; and eighteen red-tailed hawk (*Buteo jamaicensis*) nests within the project area and four within two miles of the project border.

Most raptor nests within the project area occur along the central and eastern portions, where topographic irregularities provide suitable nesting structures. The number of known nests within and adjacent to the project area does not imply that all are active during a given year. Though not documented from the project area, other species that may be present as occasional nesters, migrants, or winterers, include

rough-legged hawk (*Buteo lagopus*), Swainson's hawk (*Buteo swainsoni*), bald eagle (*Haliaeetus leucocephalus*), Cooper's hawk (*Accipiter cooperi*), sharp-shinned hawk (*Accipiter striatus*), northern harrier (*Circus cyaneus*), merlin (*Falco columbarius*), American kestrel (*Falco sparverius*), long-eared owl (*Asio otus*), short-eared owl (*Asio flammeus*), and burrowing owl (*Athene cunicularia*).

The proposed action is planned to occur outside of the breeding season of all raptor species. The principal potential effects of the project on raptor species will be minimal, such as reductions in prey populations and displacement due to project activities. To protect nesting raptors, if project field activities are proposed during the period between February 1 and July 31, raptor nest surveys will be conducted to locate nests occupied in 2009. From February 1 through July 31, geophysical operations shall not be permitted on BLM-administered lands within a 0.5-mi radius of all occupied nest except for ferruginous hawk nests, for which the seasonal buffer is a 1.0-mi radius. For burrowing owls, the nest restriction stipulation applies from April 1 through September 10 within 0.5-mile radius of nests. Burrowing owl habitat will be avoided, however, due to the 50-foot avoidance area of white-tailed prairie dog burrows. PGS may apply for an exception to the nesting raptor stipulations to conduct geophysical activities during the nesting season, in accordance with the Green River RMP, Appendix 7 (BLM 1997).

3.9.5.2 Pygmy Rabbit

The pygmy rabbit (*Brachylagus idahoensis*) typically is distributed in dense stands of big sagebrush growing in deep, loose soils. Approximately 60 acres of potential pygmy rabbit habitat was mapped as part of this project (TRC 2008). The project will avoid mapped pygmy rabbit habitat.

3.9.5.3 Wyoming Pocket Gopher

The Wyoming pocket gopher (*Thomomys clusius*) is restricted to a small portion of south central Wyoming, in Sweetwater and Carbon counties, and may extend slightly into northern Colorado (Beauvais and Dark-Smiley 2005). Little is known regarding Wyoming pocket gophers, but their life history is assumed to be similar to that of the northern pocket gopher (*T. talpoides*). Wyoming pocket gophers feed primarily on forbs and grasses. They live and nest in burrow systems and are active year round. These gophers prefer habitat with well-drained, gravelly soils on ridge tops. The Proposed Action will avoid all burrows by 50 feet, practicable; therefore, a "no effect" determination has been made for this species.

3.9.5.4 White-tailed Prairie Dog

The range of the white-tailed prairie dog (*Cynomys leucurus*) occurs across the western states including central and southern Wyoming. White-tailed prairie dogs generally are found at altitudes ranging between 5,000 and 10,000 feet in desert and shrub grasslands. Other sensitive species, such as the black-footed ferret and burrowing owl, rely on prairie dog colonies. Like other prairie dog species, the white-tailed has been declining as its suitable habitat is disturbed or developed, and individuals are shot and poisoned. Prairie dogs are known to occur throughout the project area. The project will avoid burrows by fifty feet; therefore no effects to prairie dogs is anticipated.

3.9.5.5 Greater Sage-Grouse

The status and potential impacts to this species have been discussed in Section 3.2.9.3.1.

3.9.5.6 Mountain Plover

Suitable breeding habitat for mountain plover (*Charadrius montanus)*, a BLM sensitive species, in western Wyoming generally overlaps with that of prairie dogs and consists of shortgrass prairie or sparsely vegetated areas within shrub steppes.

It is unknown if mountain plovers inhabit the project area. However, because there is abundant white-tailed prairie dog habitat in the project area, mountain plover has the potential to occur there. As proposed, the project would occur during a period of year when mountain plovers are not found in the

state. However, in the event that the proposed action may extend into the breeding season, active mountain plover habitat will be avoided between April 10 and July 10. Exceptions to the above-listed stipulations may be granted on a case-by-case basis.

3.9.5.7 Sage Thrasher

The breeding distribution of the sage thrasher includes shrub-steppe communities dominated by big sagebrush between 4,200 and 6,700 feet elevation, and was mapped as occurring in southwestern Wyoming. This bird seems to prefer plant stands that are approaching climax condition and are less disturbed than surrounding areas. Foraging habitat contains a diversity of shrubs, forbs, and grasses in a more open understory within five meters (16.4 feet) of the nest (Buseck et al. 2004). Sage thrashers typically place their nests within or under mature, living shrubs with good basal cover. However, the proposed project schedule currently occurs outside the period when sage thrashers are present in Wyoming.

3.9.5.8 Loggerhead Shrike

The loggerhead shrike has been recorded in Lincoln and Sweetwater counties in Wyoming (Keinath and Schneider 2005). This species prefers open country with scattered trees and large shrubs at lower elevations, relative to surrounding topography. For nesting, presence of dense shrubs or trees with open herbaceous areas for foraging nearby seems to be important. Loggerhead shrikes have been known to inhabit fencerows between pastures, old orchards, mowed roadsides, cemeteries, and other human-influenced areas, but are not likely to nest in such areas (Keinath and Schneider 2005).

The shrike is likely to nest throughout the project area where this habitat is available, however, the Proposed Action schedule lies outside the period when loggerhead shrikes are present in Wyoming.

3.9.5.9 Brewer's Sparrow

The Brewer's sparrow (*Oreoscoptes montanus*) is a sagebrush-obligate dependent upon relatively flat shrub-steppe habitats in the Great Plains states west to Arizona and Nevada. Surveys have shown large populations of Brewer's sparrows occur in southwestern Wyoming, primarily where dense sagebrush stands have an average canopy height of less than 5 feet (Hansley and Beauvais 2004a). Nests often are placed in the largest shrubs in the densest stands of a large patch size. This habitat profile is similar to that for greater sage-grouse and is available within the project area.

Brewer's sparrows are documented in the project vicinity and most likely occur within the project area; however, the proposed project schedule lies outside the period when Brewer's sparrows are present in Wyoming.

3.9.5.10 Sage Sparrow

Known breeding distribution of the sage sparrow (*Amphispiza belli*) was mapped in southwestern Wyoming, peaking in Sweetwater County (Hansley and Beauvais 2004b). This songbird only occurs in sagebrush habitats and correlations have been made between bird density and height and density of big sagebrush. To be attractive to sage sparrows, a sagebrush stand needs to be at least thirty acres. Breeding pairs typically have territories five acres in size (Hansley and Beauvais 2004b). A pair will often choose the tallest, live shrubs in the densest stands for their nest site, similar to Brewer's sparrows.

Sage sparrows likely inhabit portions of the project area in tall dense sagebrush; however, the proposed project schedule will be completed outside the period when sage sparrows are present in Wyoming.

3.9.5.11 Great Basin Spadefoot Toad

The Great Basin spadefoot toad (*Spea intermontana*) prefers sagebrush communities below 6,000 feet in elevation, although they have been found at elevations of 9,200 feet. Spadefoot require loose soil to burrow. In Wyoming, this species is most abundant west of the Continental Divide in the Wyoming

Basin and the Green River Valley (WYGF 2008). Spadefoot likely inhabit portions of the project area and will be occupying winter burrows at the time of the proposed action.

Environmental Consequences of the Proposed Action on BLM Sensitive Species

With adherence to BLM stipulations provided in Section 4.9, impacts to BLM sensitive species are expected to be minimal. Land disturbance resulting from the Proposed Action is not expected to result in direct, long-term adverse effects to areas occupied by BLM sensitive species during critical seasons. However, exploration activities may create temporary disturbance to areas used by a few sensitive species, particularly spadefoot toads and their associated winter burrows. Areas used by greater sage-grouse and other sagebrush obligates for brood rearing and winter cover/foraging; areas potentially used by pygmy rabbit and white-tailed prairie dog for foraging; and hunting/foraging habitat for raptors will be temporarily affected.

Overall Environmental Consequences of the Proposed Action on Wildlife and Special Status Animal Species

The primary resource values that could be affected by the proposed surface disturbance activities from this project are big game crucial winter ranges, raptor nesting and wintering areas, white-tailed prairie dog habitat, and sagebrush steppe species such as pygmy rabbit (*Sylvilagus idahoensis*).

Over the project duration, disturbance of wildlife and habitat in the project area will reduce habitat availability and effectiveness for a variety of small mammals, birds, reptiles, amphibians, and their predators. Surface disturbance from drill buggies and vibroseis vehicles would increase noise levels and could result in some direct mortality to small mammals and birds. Quantification of these losses is not possible due to the high reproduction potential of some of these species, the relatively small amount of potentially disturbed habitat, and the temporary nature of the disturbance. Common small mammal and songbird populations quickly return to predisturbance levels following completion of the project. No long-term effects on populations of common small mammals and songbirds are anticipated.

3.10 WILD HORSES

Environmental Consequences of the Proposed Action

Wild horses are not anticipated to be affected by the proposed geophysical project and are not be given further consideration in conditions of approval.

Affected Environment/No Action Alternative

Wild horses are managed in the Salt Wells Creek Herd Management Area (HMA) at an Appropriate Management Level (AML) range of 251 to 365 adult horses. The Salt Wells Creek HMA is southeast of Rock Springs, within Sweetwater County, Wyoming. The Salt Wells Creek HMA is approximately 1,193,000 acres, 725,704 acres of which are public. The remaining acres are privately controlled. The majority of the private land holdings in the Salt Wells Creek HMA are in a checkerboard land pattern, with every other section alternating between public and private owned or controlled land. The aforementioned land status pattern stems back to the land grants given to the railroad companies (in this case, the Union Pacific Railroad Company) to develop transportation corridors in the West. The Rock Springs Grazing Association is currently in control of most of the private lands in the checkerboard within the Salt Wells Creek HMA. The Rock Springs Grazing Association and Wild Horses Yes organization entered into an historic agreement in 1979 that provided for the management of specific numbers of wild horses on these privately controlled lands and the contiguous public lands. This was later affirmed as the framework for wild horse management in the area now known as the Salt Wells Creek HMA through the Green River RMP. A wild horse gathering January 2007 reduced the number of wild horses in the Salt Wells Creek HMA to the low range AML of 251 wild horses.

3.11 VISUAL RESOURCES

Environmental Consequences of the Proposed Action

In order to avoid linear visual obtrusions and reduce soil compaction and the degree of vegetation loss, BLM requires that geophysical projects offset their vehicle operations such that the tires of one vehicle do not overlap the path of another. This approach has been successful for other geophysical projects and prevents the development of new linear two tracks. With this vehicle offsetting system and the prescribed slope restriction visual impacts caused by the project would be anticipated to be low level and short term.

Affected Environment/No Action Alternative

The majority of Marianne 3-D project area falls within visual resources management (VRM) Class IV designation. There is a small portion of the project area that is VRM Class III corresponding to the northern portion of the project area along the I-80 corridor. Based on BLM guidelines within Class IV areas (BLM 1997), actions on public lands can result in major modifications to character to this landscape; however, every attempt should be made to minimize the impacts of these activities through careful location and minimizing disturbance. Activities within the VRM Class III areas should be designed to retain the characteristics of the landscape.

The area is a classic Wyoming landscape which creates a feeling of vastness and open space. Buttes in the distance enhance the scenic value of lands in the project area.

The project consists of gently rolling hills with minimal elevation change. The landforms give the area the overall appearance of binge wide open country with minimal elevation change. Any typical view contains foreground, middle ground and background views.

Lines in the landscape are predominantly horizontal.

Color in the landscape is predominantly gray-green for most of the year. Vegetation is predominately sagebrush and grasses with sagebrush being the predominant species. Subtle variation in color results from different concentrations and densities of the vegetation.

Texture of the land features is mostly smooth with the exception of vegetation viewed in the foreground. Texture of the vegetation in the foreground is rough and coarse.

In all foreground and middle ground views, the dominant features in the area are low rolling hills, horizontal lines, mostly green-grey appearing sagebrush communities, coarse to medium texture to the landscape.

3.12 RECREATION

Environmental Consequences of the Proposed Action

Project operations might disrupt recreation activities by visibly and audibly intruding on recreationists and by temporarily displacing game, which would inconvenience hunters if project operations overlap with hunting seasons. Considering the small size of the project area, impact to hunting is expected to be minimal. Due to the low levels of other recreation use in the Marianne 3-D project area, effects to dispersed recreation are anticipated to be minimal. Impacts to recreation resources are considered to be insignificant. Impacts to recreation resources would be considered minor and temporary.

In the RSFO, temporary casual OHV use is permitted on a case-by-case basis for tasks that support formally permitted actions. Casual use in such instances is defined as the single pass of vehicles under 10,000 lbs gross vehicle weight off-road, subject to the 25% slope restriction (in conformance with BLM

Manual 3150, part 3.1.B.5). Surveyors, biologists, and archaeologists working on project planning and inventories operate under this exception. With the OHV use limitations stipulated, no resource damage is anticipated as of OHV casual use authorization.

Affected Environment/No Action Alternative

No recreational management areas occur within the proposed project area (BLM 2006f). Recreational use in the project area is moderate; the demonstrated recreational uses would include hunting of species such as elk, mule deer, and pronghorn. Other potential use is pronghorn, visiting of historical trails/roads, riding, hiking, and model airplane use.

BLM-administered lands in the project area are limited to existing roads. OHV management calls for motorized vehicles to stay on existing roads and trails, unless permitted or otherwise allowed an exception by the AO. RMP decisions recognize the use of vehicles for geophysical operations may be given site-specific authorization for off-road use in areas with OHV designations subject to appropriate limitations.

3.13 CULTURAL/HISTORICAL RESOURCES/HISTORIC TRAILS

Environmental Consequences of the Proposed Action

There will be no affect to cultural resources under any alternative.

Affected Environment/No Action Alternative

There will be no effect to cultural resources under any alternative.

3.14 NATIVE AMERICAN RELIGIOUS CONCERNS

Environmental Consequences of the Proposed Action

There will be no effect to properties of concern to Native Americans under any alternative.

Affected Environment/No Action Alternative

No properties of concern to Native Americans currently are known within the project area.

4.0 Cumulative Impacts

The BLM must consider the cumulative effects of the Proposed Action in conjunction with other activities. A cumulative impact is an impact on the environment that results from the incremental impact of the proposed action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency or person undertakes such other actions. Cumulative impacts result from individually minor but collectively significant actions taking place over a period of time (40 CFR 1508.7).

Cable deployment and vehicle traffic will cause animals to leave the immediate area of human activity. Wildlife displacement will be brief and localized, as small-scale transitory activities would be spread over multiple small sites within the project area. Overall, with implementation of the seasonal restrictions protecting wildlife during the more sensitive birthing/rearing season, no significant impacts to wildlife would be foreseen as a result of this activity.

With implementation of the proposed measures prescribed in this document, the primary impact associated with the proposed action is that of driving on the ground surface in the project area and potentially damaging, and to a much lesser extent killing, a percentage of the brush within the tire paths.

This project will affect primarily vegetation and visual resources. No cumulative impacts to other resources are foreseen.

Incremental effects to overall vegetation are considered negligible because:

1) They are limited to species composition changes (not vegetation removal/dirt work);
2) Species composition changes would occur on less than 3% of the project area;
3) Species composition shifts would involve only a proportional change among existing native plants (no introduced species); and
4) Species composition changes would be short term, as new brushy plants would begin to reoccupy the vehicle paths within a few years.

As with visual resources, BLM field inspections of past projects have indicated that 3-D seismic projects do not create major vegetative changes. The amount or percentage of sagebrush actually killed within the thinned corridors (under tire tracks and pads) is considerably less. Cumulative impacts to vegetation are therefore not expected to differ much from those described under environmental consequences above and are expected to be minimal.

Given the relatively low-level and short-term nature of the anticipated project impacts and the implementation of the protective measures proposed, the proposed action together with on-going activities, will not adversely affect elements of the human environment.

No Action Alternative

Adoption of this alternative would not end oil and gas exploration or development. With or without the geophysical data, well drilling is anticipated in the project area. Without the 3-D data, lessees are more likely to drill dry holes, causing greater environmental impact than if they had the 3-D data. Well pad and access road construction for dry holes involves removing vegetation cover. Seismic exploration is the least surface-disturbing means available to obtain subsurface geologic data.

4.1 Residual Impacts

No residual effects are expected, as the mitigation measures would avoid or minimize impacts. Minor residual effects could be expected; vegetation where plants or branches have been crushed.

5.0 List of Preparers

The following individuals prepared, coordinated and developed the Marianne 3-D EA.

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APPENDIX A

OPERATOR COMMITTED MEASURES

The Operator (PGS-Petroleum Geo Services) will adhere to the following specific environmental commitments:

1. No project activity will be conducted from November 15 to April 30 in the pronghorn and mule deer crucial winter range, except by written exception by the RSFO.
2. In the event of weather-related delays, all geophysical testing and off-road access using mechanized equipment will be terminated in all project areas no later than December 31, 2008, to avoid impacts to raptors, sage-grouse, migratory birds, and other biological resources.
3. Equipment will only use established crossings of Salt Wells Creek, will avoid any activity within a 500-foot buffer along Salt Wells Creek (Figure 3), and will terminate activity within a safe setback distance of any incised cutbanks, unless prior approval has been obtained from the RSFO.
4. Project operations will not begin in any project area until Class III cultural resources inventories have been completed and approved by the BLM for Marianne 3-D project operations, contingent upon establishment of satisfactory avoidance measures for all cultural properties unevaluated and Eligible for NRHP nomination. Class III cultural resource inventory reporting and site forms conducted to BLM Wyoming Cultural Resource Use Permit standards will be provided, and cultural resources, except those determined Not Eligible for NRHP nomination, will be avoided by the Proposed Action, impacts, and disturbances.
5. A Project Area map will be provided pursuant to Class III cultural resources inventories that have all the travel routes, staging areas, drive around ways, and support areas designated on USGS 1:24,000 scale topographic quadrangle copies. This map will indicate all proposed source access routes for the Marianne 3-D project, off-road and on unimproved two-track roads covered in Class III cultural resources inventory. During field operations, all Marianne 3-D project field crew leaders will have a copy of this map.
6. All source line access and use-created two-track road travel on BLM land will be confined to a corridor 100-foot-wide (50 feet on either side of centerline) along lines that have been inventoried for cultural resources or to existing improved roadways.
7. All NRHP-Eligible and unevaluated cultural resource sites on federal or non-federal lands will be avoided by minimum distance of 100 feet of the site boundary, or to the existing track of any access roadway passing nearer to or through such a site, with no pullouts, ‘turn-arounds,’ or other off-road use within 100 feet of the site.
8. Shot holes, blasting, and vibroseis locations will be placed at least 300 feet away from and not on any segments of Historic Trails contributing to, or unevaluated as to their contribution to, the NRHP eligibility of an overall trail site. These trail segments may be used by ORVs only where prior BLM-approved site-specific analysis indicates that no adverse effects would occur, such as at points of existing disturbance and intersecting roadways and utility routes.
9. Source lines in the setting of significant Historic Trail segments, and other cultural resources for which setting is a concern, will have source line travel routes and source point locations designed and positioned to minimize visual impacts by using curvilinear or “snail trail” lines of travel and by off-setting tire tracks so that one vehicle does not drive the exact path as another vehicle.

10. Based on BLM standards and previous practice, sites of potential cultural concern or sensitivity to Native American Tribes will be avoided by a minimum radius of 300-foot from the site edge, or within the visual horizon and setting or "viewshed" of a rock art site by a distance of 0.5 mile or to a position blocked from view from the rock art locus, whichever is nearer. These culturally sensitive sites may be subject to other special measures, as specified by the BLM, following Native American tribal consultation or advisement.
11. Any cultural resource (historic or prehistoric site or object) discovered by the Proponent or any person working on his behalf shall be immediately reported to the BLM Authorized Officer (AO). The Proponent shall suspend all operations in the area of such discovery until written authorization to proceed is issued by the AO. An evaluation of the discovery will be made by the BLM to determine appropriate actions to prevent the loss of significant cultural values. The Proponent will be responsible for the cost of evaluations and for mitigation. Mitigation may include rerouting or excavation, and the AO will make any decision as to proper mitigation measures after consulting with the Proponent.
12. Pursuant to 43 CFR 10.4 (g), the Proponent shall notify the AO by telephone, with written confirmation, immediately upon the discovery of human remains, funerary objects, sacred objects, or objects of cultural patrimony (as defined in 43 CFR 10.2). Further pursuant to 43 CFR 10.4 (c) and (d), the Proponent shall immediately cease all activities in the vicinity of the discovery and protect it for 30 days or until notified to proceed by the AO.
13. All project personnel are to be instructed of the confidentiality of site locations and that the collection of artifacts is prohibited by law.
14. Pygmy rabbit and Wyoming pocket-gopher habitat will be avoided to the extent practicable, and a 50-foot buffer will protect prairie dog burrows.
15. ORV traffic will avoid stands of tall sagebrush (>4 feet) to avoid impacts to wildlife.
16. Operators will have and implement the terms in an Emergency Response Plan, a Field Safety Plan, and a Spill Prevention Plan, and will follow other Best Management Practices for the control of noise and waste, and will otherwise provide for the safety of workers and the public.
17. All receivers and any other project-related materials will be removed from BLM land before December 31, 2008.
18. Prior to December 31, 2008 certified weed-free straw or other mulch will be applied in heavily disturbed areas where erosion potential is deemed likely.
19. All project equipment staging, fuel and other hazardous material storage, and waste storage will occur on private land and will adhere to all Wyoming Department of Environmental Quality and other permit requirements.
20. Any special status plant discovered by the Proponent or any person working on his behalf shall be immediately reported to the BLM Authorized Officer (AO). The Proponent shall suspend all operations in the area of such discovery and the area will be flagged and excluded to avoid any loss of any special status plant.
21. Project Reseeding Guidelines:

    At the earliest mutual convenience upon completion of the project, areas disturbed by seismic activities will be evaluated in the field by the BLM-Authorized Officer and a proponent representative to determine the need for restorative revegetation.

In General:

Disturbed areas where major compaction has occurred will require scarification or discing to loosen subsoil.

Certified weed-free straw or other mulch may be applicable where erosion potential is deemed likely.

Planting will occur between September 15 and the time of ground freeze or snow cover, or in the spring before May 30. Seed must be certified weed-free. Pounds of seed specified in the mix are based on weight of pure live seed (PLS). The total 34 pounds of mixture PLS are to be applied to 1 acre. This application rate is double that for drilled seed, based on the assumption that the seed will be dispersed and raked by hand.

The basic seed mix below will be used or modified as directed by the Authorized Officer. Native species that will be considered include blue bunch wheatgrass, streambank wheatgrass, bottlebrush squirrel tail, needle-and-thread grass, Gardner's saltbush and big sagebrush. The Wyoming Game and Fish Department recommends that shrub species be considered in seed mixtures.

Seed should be broadcast as uniformly as possible and incorporated in the soil with hand rakes to an optimum depth of 0.5 inch.

Recommended General Seed Mixture:

Species	**Latin Name**	**Pounds PLS per Acre**
Thickspike wheatgrass	*Elymus lanceolatus* ssp. *lanceolatus*	6
Western wheatgrass	*Pascopyrum smithii*	6
Indian ricegrass	*Achnatherum hymenoides*	6
Scarlet globe mallow	*Sphaeralcea* spp.	2
Winterfat	*Krasheninnikovia lanata*	2
Gardner's saltbush	*Atriplex canescens*	2
Total		**24**

APPENDIX B

CONDITIONS OF APPROVAL (COA)

The following mitigation measures and COAs would be applied by the BLM during the permitting process for individual components as deemed necessary to further reduce adverse impacts upon the environment. Furthermore, additional site-specific mitigation measures may be identified and applied during site visits and reviews. Stipulation would be enforced where applicable. Activities on all lands would be conducted in accordance with all appropriate federal, state, and county, laws, rules, and regulations. The COAs detailed below are in conformance with BLM-required mitigation.

Fluid Minerals: Oil and Gas

Source points should be located a minimum of 300 feet from standing structures and rock art sites, unless written permission to encroach closer has been given by the land owner or operator (BLM 1988).

Operators should be required to repair any damage to facilities caused by their operations.

Paleontological Resources

If vertebrate paleontological resources (fossils) are discovered on BLM-administered land during project operations, operators shall suspend operations that could disturb the materials and immediately contact the BLM RSFO Manager AO. The AO will arrange to evaluate the find within five working days and determine the need for any mitigation actions that may be necessary (BLM 1997). Any mitigation will be developed in consultation with the operator, who could be responsible for the cost of site evaluation and mitigation of the project effects to the site. If the operator can avoid disturbing a discovered site, operations would not have to be suspended; however, the discovery would be immediately brought to the attention of the AO.

Soils

Driving on sand dunes will be minimized, and shot holes should be offset to the interdunal swales where possible. Should any steep-sided drainage be encountered, they should not be crossed by any vehicle. This will protect the fragile banks. Low bank areas can be used for drainage crossings. Any surface damage shall be repaired to the satisfaction of the BLM inspector as soon as possible after the completion of operations, but no later than March 2009.

No vehicle operations (e.g., vibrator buggies, recorder trucks, pickups, OHVs) will be allowed on slopes of 25% or greater. The Operator shall conduct no vehicle operations during periods of saturated ground conditions when surface rutting could occur (BLM 1997 p. 159). Ruts over 2 inches in depth will cause the operator to cease all operations until further notice or until conditions change.

Water Resources

Although seismic exploration is not considered a surface-disturbing activity, several standard practices outlined within this document and the Green River RMP would help to minimize potential disturbance:

- No surface disturbance, maintenance point, etc. would be permitted within 500 feet of any riparian or wetland areas, or within 100 feet from the outer edge of the cutbanks of channels or the inner gorge of large ephemeral channels.

- To the extent practical, all surface travel will occur on existing roads and trails (with the exception of contributing historic trails), and equipment will be used to establish channel crossings.

- Vibration or detonation points or detonation would not be located directly in active channel bottoms, within 0.25 miles of a seep or spring, or within the inner gorge of ephemeral channels.

Vehicular traffic across/through drainage channels shall be limited to existing crossings and should be aligned perpendicular to the stream channel, to the extent practical.

Vegetation

Because all vehicles would use staggered patterns for cross-country travel, crushing of vegetation is an expected impact, but will be minimized to the extent possible. Previous geophysical projects where an offset vehicle pattern was used show that shrub plants in the vehicle paths can be crushed or killed, but underlying grasses and forbs survive. Cushion plant communities on slopes and in other areas that are susceptible to erosion could take over twenty years to recover if disturbed by heavy equipment. Use of helicopters or a single pass by big-tire buggies are intended to limit impacts to cushion plant communities to the extent possible. Any reclaimed areas that become rutted due to truck traffic shall be reseeded. Seeding will continue until successful reestablishment of the ground cover.

Special Status Plants

No special status plants are known to occur in the project area. If any are found they will be excluded from any surface disturbing activity.

Noxious/Invasive Plants

To prevent the introduction of new weeds, the Operators shall thoroughly power-wash all field vehicles (vibrator buggies, pick-ups, OHVs, etc.) before transporting them in and out of the project area.

The Operator shall reclaim and reseed any areas where their operations have caused surface rutting or have otherwise removed all of the surface vegetation as directed by the AO (seed mixture guidelines are listed in Appendix D).

Livestock/Range Resources

The Operator shall make every effort to avoid disturbing or altering fences. The fence should be passable for most wire or cable apparatus, but vehicles will be required to go around the fence through established gates. If this fence is broken in any capacity, the operator would be responsible for immediately notifying BLM range staff with the location in order to coordinate fixing the break by a qualified person with expense paid by the operator.

Locate and mark any range improvements such as stock waterlines, springs and tanks. Moving or altering any range improvement project is not authorized. The Rock Springs BLM range staff shall be notified before any moving or alterations. The operators would be responsible for the repair and/or replacement of any facilities damaged during the course of the project.

Other additional mitigation measures to protect livestock and rangeland under the Proposed Action:

- Coordinate with livestock permittees during seismic exploration activities.

- Complete reclamation immediately to reduce potential for invasive nonnative species and to restore forage on the sites.

- Carpool crews to the area to reduce traffic and potential for collisions with livestock.

- Strictly enforce speed limits.

Wildlife and Special Status Animal Species

No project activity will be permitted from November 15 to April 30 in the pronghorn and mule deer crucial winter range unless exception is granted.

In the event severe winter weather conditions occur and big game species are utilizing the severe winter range, no activities would occur within that area from November 15 to April 30.

Speed limits will be strictly enforced to reduce collisions with big game species.

Mapped pygmy rabbit habitat will be avoided.

Black-footed ferrets will be minimized by the 50 foot avoidance of white-tailed prairie dog burrows.

In the event any black-footed ferrets or their sign are observed during construction, the Service recommends that the project be halted and the Service contacted as soon as possible.

To protect wildlife cover, vehicle traffic should avoid stands of tall sagebrush. Stands of tall sagebrush are defined as areas in which the majority (more than 50%) of sagebrush plants are 4 feet or taller.

No water will be used in this project that is considered depletion from the Colorado River system which would require ESA Section 7 consultation.

Raptors, Mountain Plovers and Migratory Birds

In order to protect nesting raptors, mountain plovers, and migratory birds such as the BLM sensitive sage thrasher, loggerhead shrike, Brewer's sparrow, and sage sparrow, project field activities are not proposed during the period between February 1 and July 31. However, if project activities occur between February 1 and July 31 then raptor nest surveys will be conducted to find nests occupied in 2009 and geophysical operations shall not be allowed on BLM-administered lands within a 0.5-mi radius of all occupied nest except for ferruginous hawk nests, for which the seasonal buffer is a 1.0-mi radius. For burrowing owls, the nest restriction stipulation applies from the period April 1 through September 10 within 0.5-mi radius1. Burrowing owl habitat will be avoided, however, due to the avoidance of all occupied nests. Mountain plover habitat will be avoided between April 10 and July 10. Exceptions to the above-listed stipulations may be granted on a case-by-case basis.

Visual Resources

Class III VRM actions will be retained on public lands near the I-80 corridor.

The Operators should offset all ORV traffic over a 50-ft-wide swath on either side of the staked seismic line so that one vehicle does not drive the same path as another vehicle.

In accordance with the Green River RMP (BLM 1997, p. 4), large, heavy, motorized vehicles could cross and drive down historic trails, provided a site-specific analysis is conducted prior and determines that no adverse effects would occur and that any shot holes, blasting, or vibroseis locations be placed at least 300 feet from the trail and do not occur directly on the trail. Analysis of contributing historic trails indicates that motorized vehicle traffic related to seismic exploration would result in an adverse effect to the Overland Trail were it allowed. Operators will maintain a 300-ft buffer on each side of the contributing Overland Trail and are prohibited from driving down it.

All vibration points within 0.25 mi of the trail ruts on federal lands will be hidden behind topography to the extent possible. The archaeological consultant has flagged appropriate "snail trails" (curvilinear routes) which allow the operator to approach to and egress from the 300 foot buffer margin in such a

fashion that there will not be linear intrusions evident from the trail. This same prescription will be followed for all segments of Overland Trail which remain unevaluated.

Recreation

ORV use in advance of issuance of project approval would be limited to the single pass (no overlapping tire tracks) of vehicles under 10,000 lbs GVW (AVSs and 1/2-ton pick-ups or the equivalent in conformance with BLM Manual 3150, part 3.1.B.5). The 25% slope restriction, saturated soil restriction, and seasonal greater sage-grouse nesting seasonal restrictions would still apply.

To prevent conflicts with recreation users, alternative access may be needed.

Socioeconomic Resources

No approval conditions have been identified.

Cultural/Historic Resources/ Historic Trails

A Class III cultural resources inventory is being conducted on federal lands where project-related ORV traffic would occur, specifically, on all source lines, staging areas and places likely to experience surface impacts from the project. The inventory is not required for areas covered by previous inventories, provided those inventories meet current standards. The cultural resources inventory is designed to locate and prescribe avoidance routes or other mitigation for all significant sites, previously recorded as well as newly discovered. Previously recorded, NRHP eligible and unevaluated cultural resources on private lands, as revealed through a records check, will be avoided by 100 feet except as discussed below, even if not subject to the Class III cultural resources inventory. Standard site avoidance entails a 100 feet or more buffer zone around all eligible and unevaluated sites on federal or non-federal lands. Standing structures or rock inscriptions will have a buffer of 202 feet from all ground disturbing activities. Sites of potential Native American concern will be subject to special measures, as specified below. Sites previously determined to be ineligible for nomination to the NRHP require no further action should they still lack qualities which might make them eligible for consideration for inclusion within the National Register of Historic Places. Sites that have changed sufficiently to warrant a modified site form or site form addendum are being reevaluated.

No project-related vehicle traffic (industrial access) is permitted on or across the contributing or unevaluated segments of the Overland Trail, unless the route is approved by the BLM archaeologist and will not result in resource damage. The Overland Trail could otherwise be crossed at existing disturbances or in areas previously determined to be noncontributing.

Source lines in the setting of significant or unevaluated Overland Trail and other cultural resources for which setting is a concern will have source line travel routes and source point locations designed and positioned to minimize visual impacts to the settings of concern. Curvilinear or "serpentine" approach patterns (also known as "snail trails") will be used in substitution for straight-line or straightaway approaches. Curvilinear approaches will be designed in relation to the local topography and vegetation to reduce overall visual impacts from the vantage point, or "key observation points," of significant trail and other cultural sites for which setting is concern.

Long-term effects to the setting of eligible or unevaluated segments of the Overland Trail will not be permitted. If the stipulations above are followed, there should only be short-term (less than three years) impacts. Should there be any unanticipated damages; the applicant shall fund necessary remediation measures to restore the setting to its former condition.

Native American Religious Concerns

If any sites of potential Native American religious and/or cultural concern (e.g., rock art, vision quest structures, human burial sites, Native American cairns, stone circles, herb-gathering areas, stone alignments, altars, medicine wheels) are identified by personnel or subcontractors within the project

boundary but outside the cultural resources inventory (vibe line) corridors, the RSFO archeologist shall be notified promptly. The BLM shall determine the need for special measures and/or Native American consultation. This stipulation applies to both federal and nonfederal lands.

Native American cultural sites such as cairns, stone circles, altars, herb gathering areas, and some stone alignments shall be avoided by a minimum of 300 feet unless closer activities are approved through completion of consultation with the affected tribes. Sites including burials, rock art, and medicine wheels, if found, likely will require more substantial buffers.

Noise, Waste and Safety

The Operators will clean up all oil, diesel, or hydraulic fuel spills, including contaminated soils. All spill-related materials should be hauled to a Wyoming-Department of Environmental Quality (DEQ) approved disposal site. Spills that result from ruptured pipelines or well casings shall be cleaned up as directed by DEQ and the facility owner/operators.

An Emergency Response Plan will be prepared addressing fire and submitted to the AO for review at least one week before any project field operations.

The Operators will coordinate with the nearest paramedic providers for life flight and ambulance services to establish landing zones across the project area. These zones would be used in case of serious injury to workers needing immediate evacuation.

The Operators will keep noise levels at a minimum where vehicles are not used extensively for unnecessary travel, especially between 9:00 P.M. and 8:00 A.M.

The Operators will place all tanks holding bulk liquids in lined and bermed areas. Capacity of the bermed area shall be 100% of the largest tank. Bulk liquids contained in tanker semi-trailers may be parked in a safe location on the staging area. Fueling of equipment or maintenance of equipment should be done away from riparian or other open water areas.