

ENVIRONMENTAL ASSESSMENT

Lease/Serial/Case File No: WYW-162984		EA Number: WY-020-E06-E06
Proposed Action: Four Bear Field 3-D (Vibroseis)		
Applicant (if any): Nance Petroleum Corporation		
TN. 48 N.	RGE. 103, 104 W.	SEC(S): var.
Author: Vic Seefeldt		Date: August 7, 2006

I. Introduction

Need for Proposed Action: Nance Petroleum Corporation has submitted a plan to conduct a three-dimensional (3-D) vibroseis geophysical prospect in and around the Four Bear Oil Field (See Map I). The objective of the project is to determine structural and reservoir characteristics in the area. The Cody Field Office of the Bureau of Land Management must decide whether or not to approve to proposal submitted by Nance Petroleum Corporation or some alternative to the proposal, and if so, what stipulations or conditions to apply to the approval. Before BLM may make these decisions, the National Environmental Policy Act of 1969 requires the preparation of an Environmental Assessment to assess and disclose the potential environmental effects and determine whether or not these impacts could be “significant”, as the term is used in NEPA.

Relationship to Statutes, Regulations, Policies: BLM policy requires that environmental effects of a proposed action and reasonable alternatives be properly assessed and documented in an environmental assessment to assure their decision is informed and the impacts are not expected to be significant; and to provide a means to disclose the impacts to the public and allow public participation in the decision-making process. If there is a potential for significant impact to the human environment, an environmental impact statement must be prepared. The primary regulation governing the analysis process is 40 CFR Part 1500.

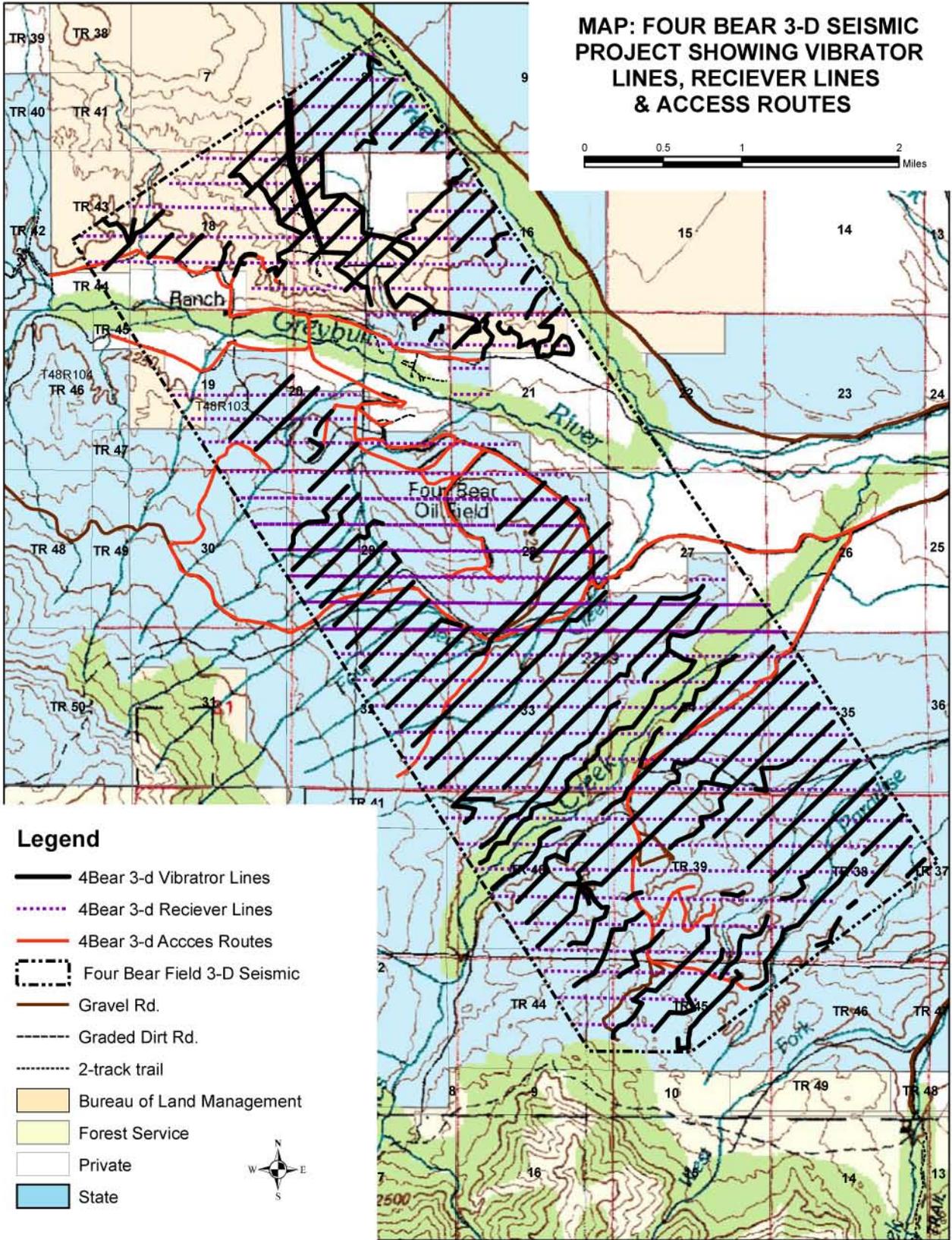
The principal statutes governing oil and gas exploration and production on public lands are the Mineral Leasing Act of 1920 and the Federal Land Policy and Management Act of 1976. BLM regulations for oil and gas development are found in 43 CFR 3100. Regulations specific to geophysical exploration are contained in Part 3150.

Related NEPA Documents: This EA is tiered to, and incorporates by reference, the Cody Resource Management Plan (1990) and the associated Draft and Final Environmental Impact Statements.

Conformance With Land Use Plans: The Cody Resource Management Plan (RMP) was approved on November 8, 1990 and applies to the proposed action and alternatives analyzed in this EA. That plan specified an objective "to maintain or enhance opportunities for mineral exploration and development, while providing protection or enhancement of other resource values". It anticipated the drilling of between 40 and 50 wildcat wells and 620 and 630 development wells in the decade following signature of the ROD (November 1990 and November 2000; See Cody Resource Management Plan - Final EIS, pg. 20) At this time, about 50% anticipated wells have been drilled.

In May 2001, the President’s National Energy Policy Development Group issued recommendations for developing and implementing a comprehensive long-term strategy to promote dependable, affordable, and

MAP: FOUR BEAR 3-D SEISMIC PROJECT SHOWING VIBRATOR LINES, RECIEVER LINES & ACCESS ROUTES



Legend

- 4Bear 3-d Vibrator Lines
- 4Bear 3-d Reciever Lines
- 4Bear 3-d Access Routes
- Four Bear Field 3-D Seismic
- Gravel Rd.
- Graded Dirt Rd.
- 2-track trail
- Bureau of Land Management
- Forest Service
- Private
- State



environmentally sound energy for the future. At the same time the President issued Executive Order 13212, “Actions to Expedite Energy-Related Projects”, in which agencies are ordered to

“...take other actions as necessary to accelerate the completion of such projects, while maintaining safety, public health, and environmental protections.”

The Federal Land Policy and Management Act (FLPMA) (43 USC 1701.102 (a)(7)) directs BLM to manage public lands

“...in a manner which recognizes the Nation’s need for domestic sources of mineral, food, timber and fiber from the public lands including implementation of the Mining and Minerals Policy Act of 1970 (84 Stat. 1876, 30 USC 21a) as it pertains to the public lands...”

The use of public lands and federal mineral estate for the development of reliable domestic sources of energy is consistent with the recommendations of the Energy Policy Development Group and Executive Order 13212 and FLPMA. The RMP Amendments provide for environmentally sensitive development of oil and gas resources and completion of energy development and transmission (i.e. pipelines) projects while maintaining public health and safety, and, ensuring compliance with applicable laws and regulations.

The Proposed Action would be in conformance with the RMPs’ objectives to maintain or enhance opportunities for mineral exploration, while providing protection of other resource values. The “No Action” alternative would not be in conformance with this objective, unless it were demonstrated through this EA that the proposal would cause unnecessary or undue degradation to the public lands, threaten a violation of another law (for example, the Endangered Species Act), or result in other unacceptable impacts.

II. PROPOSED ACTION AND ALTERNATIVES

ALTERNATIVE 1: PROPOSED ACTION

The proposed action is the plan of operations submitted by Nance Petroleum Corporation, as modified by the mitigation described in Section V. The entire project would occupy an area that is two and one half by six miles containing about 9600 acres or about fifteen square miles.

The survey would consist of northeast by southwest source lines and east-west receiver lines. The geophysical company plans on moving the receiver lines via helicopter in order to expedite the process and minimize surface disturbance. The proposed action includes standard geophysical mitigating measures that are normally attached to these projects as well as certain project-specific measures developed to deal with unique concerns (see Section V, Mitigation).

Vibrators (see photo below) would provide the energy to create the seismic vibrations that are reflected back toward the geophones. Two to four vibrators would travel along the source lines and stop at designated points, set-up and vibrate for a set time to set up the seismic pattern. The vibrators must be heavy enough to send adequate seismic waves, but be mobile and environmentally friendly to move cross country without creating serious compaction, rutting or gouging of the natural sod.

The specific attributes of vibrators are shown in the table below:

SPECIFIC ATTRIBUTES OF VIBRATORS	
ATTRIBUTES	QUANTITIES
TOTAL WEIGHT	63,000 Lbs./31.5 T.
LBS/SQ. IN. (PSI) - FRONT TIRES	28.6 PSI
LBS/SQ. IN. (PSI) - REAR TIRES	29.7 PSI
LENGTH	31 Ft.
WIDTH	10 Ft.
HEIGHT	11 Ft.
DISTANCE (FRONT OF FRONT TIRE TO BACK OF BACK TIRE)	20 Ft.



There are three discrete steps in a vibroseis project. They are shown in the table below.

- Step 1. Survey of lines guided by global positioning satellites (GPS), using all-terrain vehicles (ATVs) with support from a 4WD pick-up truck.
- Step 2. The geophysical crews would use wide-tire buggy-mounted vibroseis vehicles as the energy source for the 3-D seismic survey. Recording, which includes setting geophones along receiver lines and connecting them to the recorder, shooting and recording, trouble shooting (walking or driving to trouble spots on receiver lines), and moving to the next setup. Pedestrian crews move, set and remove geophones with helicopter support.
- Step 3. Cleanup includes removal of trash, and smoothing or seeding of ruts.

ALTERNATIVE 2: NO ACTION

Under this alternative, the proposed plan would not be approved and the geophysical operations would not be conducted. It is possible that the operator would choose to re-submit a modified proposal, or conduct a similar project on private and state lands only.

ALTERNATIVES CONSIDERED BUT ELIMINATED FROM DETAILED STUDY:

No other alternatives were considered.

ENVIRONMENTAL CONSEQUENCES

Mandatory or critical items are considered in the table below. An "NE" denotes no effects of any importance on the listed elements or the element is not present; see text directs attention to the subsequent table where environmental consequences are summarized.

MANDATORY ITEMS					
ELEMENT	PROPOSED ACTION	NO ACTION	ELEMENT	PROPOSED ACTION	NO ACTION
Air Quality	NE	NE	Wastes, Hazardous or Solid	NE	NE
Areas of Critical Environmental Concern	NE	NE	Water Quality Drinking/Ground Water	SeeText	SeeText
Cultural Resources	See Text	See Text	Wetlands/Riparian Zones	SeeText	SeeText
Farm Lands (prime or unique)	NE	NE	Wild and Scenic Rivers	NE	NE
Flood Plains	NE	NE	Wilderness	NE	NE
Native American Religious Concerns	See Text	See Text	Environmental Justice	NE	NE
Threatened or Endangered Species	See Text	See Text	Invasive, Non-native Species	See Text	See Text

Subsequent maps show only vibrator lines. This is because the vibrators pose the most risk in terms of erosion compaction and soil and geologic instability. The discussions on wildlife and recreation, which could be affected by receiver line activity, are adequately supported by the general map shown on the 2nd page of the environmental assessment.

AFFECTED ENVIRONMENT

After a public comment period, the Record of Decision for the Cody Resource Management Plan (Cody RMP/ROD) provided that of 1,508,200 acres of mineral estate in the planning area, all but 24,570 acres of the McCullough Peaks Wilderness Study Area would be available for lease. This allocation is balanced; the plan set aside a wilderness study area and several Areas of Critical Environmental Concern, but in a mineral rich state, Wyoming, and in a geological basin, the Bighorn Basin, that has been richly productive of petroleum resources it also made almost all lands available for lease, exploration and production.

Consistent with applicable regulations, particularly 43 CFR Part 23, the Cody RMP/ROD specified an objective "to maintain or enhance opportunities for mineral exploration and development, while providing protection or enhancement of other resource values". It also prescribed that geophysical activities would be allowed wherever leasing would be allowed. It anticipated the drilling of between 40 and 50 wildcat wells and 620 and 630 development wells in the decade following signature of the ROD (November 1990 and November 2000; See Cody Resource Management Plan - Final EIS, pg. 20). (At this time, about 50%

of the estimated number of wells has been drilled.) All oil and gas activities would be subject to resource protection provisions, particularly those found in Appendix B of the RMP/EIS.

There are about 1315 working federal wells in the Cody Field Office area (not including state, fee, cancelled, and abandoned and reclaimed wells). They are estimated to occupy between 3000 and 4000 acres when access roads, production facilities, and other installation related to oil and gas production are included. This is considerably less than 0.5% of the 1,508,200 acres of federal mineral estate covered under the Cody RMP. The field areas themselves are considerably less than 5% of the 1,508,200 acres of entire mineral estate covered in the RMP.

It's worth noting that this disturbance has produced and continues to produce substantial oil and gas resources. Two fields, Oregon Basin and Elk Basin, are included in the top five all-time producers in the state of Wyoming. This outstanding oil and gas production in the Big Horn Basin has occurred on less than five percent of the federal mineral estate. In these fields, petroleum production is the principle use. No new federal field has been developed in the Cody Field Office since the Record of Decision was signed on November 8, 1990.

When new field development is proposed, there often are calls for more balance of uses in the immediate vicinity of the development, i.e., less development. The value of the land use plan is that it has already considered a balance of uses on a regional basis and its immutability assures the institutional constancy that preserves the environment in which resource development can occur as prescribed in law, regulation and policy within the context of environmental protection provisions of Appendix "B" of the Record of Decision for Environmental Impact Statement for the Cody Resource Management Plan (Cody RMP/EIS/ROD).

Location and Setting

The proposed project is situated in the Greybull River valley about 20 miles southwest of Meeteetse, Wyoming. T. 48 N., R. 103 & 104 W. Topography in the area consists of rolling to broken hills, benches, and mesas that are dissected by several rivers or streams. Elevations range from a little below 7,000 feet on the Greybull River floodplain to almost 8,400 feet in the south end of the project area near the forest service boundary. Precipitation ranges from about 10" to a high of about 14" within the project area. Precipitation in excess of 14" probably falls in the southern end of the project area where elevations approach 8,500 feet. Most of the project area is considered to be in the Temperate Desert Division, Intermountain Semi-Desert Province, and the Bighorn Basin Section and Subsection. The area consists of footslopes 87%, open hills 8%, open low hills 3%, and alluvial valley 2%.

Surface Ownership

Ownership of the surface within the project area includes private, state, and public (see land status map). The following table shows the various landowners and the acres (subject to change because these figures are based on approximate project area boundaries not the real boundaries).

Surface Owner	Acres	%
Bureau of Land Management	1160	12
Private	1680	17
State	7130	71
Totals	9970	100

Most of the public land is situated north of the Greybull River in the northern end of the project area.

Surface Geology

Surface geology in the area consists primarily of material that has been deposited by rivers, glaciers, or landslides from steep slopes at higher elevations. Other geologic features in the area include bedrock outcrops, volcanic necks, and hot spring deposits (see Surface Geology Map).

The Quaternary landslide deposits or igneous rocks of the Wiggins Formation, are possibly problematic. Landslide deposits could be unstable at slopes greater than 25%. The igneous rocks of the Wiggins Formation are easily erodible and are more unstable on steeper slopes, but they also have internal erosion which has caused piping such that an internal void might collapse, particularly when vibrating occurs. This risk is extremely rare, but could happen. The table below indicates potential geological instability problems occur on about six acres of the entire project and about one half acre of BLM surface.

The table below shows calculations to determine length of lines and area occupied and how many acres of vibrator line occur on slopes steeper than 25% and on sites subject to erosion hazards, soil slumping or sediment loading because of unstable rock or soil or adjacency to riparian areas. In all cases steep slopes are an essential factor because vibrators don't generally remove vegetation, but as they climb steep slopes, they can shift native sod or in extremely rare cases remove sod by spinning.

LENGTH OF VIBRATOR LINES AND LENGTH OF LINES WITH POTENTIAL PROBLEMS RELATED SLOPE PLUS GEOLOGY, SOILS OR RIPARIAN VALUES OR LIMITATIONS									
ITEM	WIDTH (FEET)	TOTAL PROJECT				BLM SURFACE			
		METERS (TOTAL)	FEET (TOTAL)	MILES (TOTAL)	ACRES (TOTAL)	METERS (BLM)	FEET (BLM)	MILES (BLM)	ACRES (TOTAL)
Receiver Lines	2.00	141,020.00	462,658.42	87.62	21.24	18,700.00	61,350.96	11.62	2.82
Vibrator Lines	12.00	109,139.00	358,063.23	67.82	98.64	20,429.00	67,023.46	12.69	18.46
Vibrator Lines (>25%)	12.00	14,062.00	46,134.61	8.74	12.71	2,245.00	7,365.40	1.39	2.03
Vibrator Lines (Problem Soils & <25%)*	12.00	<i>1,548.00*</i>	<i>5,078.68*</i>	<i>0.96*</i>	<i>1.40*</i>	1,116.00	3,661.37	0.69	1.01
Vibrator Lines (Problem Geology & >25%)	12.00	6,275.00	20,587.02	3.90	5.67	592.00	1,942.23	0.37	0.54
Vibrator Lines (Problem Riparian & >25%)	12.00	3,919.00	12,857.46	2.44	3.54	130.00	426.50	0.08	0.12

- Note: Very incomplete soils information off BLM surface distorts the number shown in italics.

Soils

For vibrator lines the major hazard is erosion. (Compaction can be a concern because of the, but in most cases there is only one pass of this equipment.) The Attewan-Evanston complex, 0 to 30 percent slopes, and the Blazon Rock outcrop complex, 3 to 60 percent slopes, can have severe erosion hazards. Steepness of slope is a very important contributor. About five acres of the entire project occur on steep, potentially unstable soils, but only about one half of an acre (1/3 mile of line) occurs on BLM surface. Erosion problems could arise on other areas, particularly where a vibrator line angles up a long slope that carries substantial run off during a storm event. However, for this to be a problem the vibrator tracks would have to be able to carry runoff for several hundred feet – this is very unlikely. The soils and their characteristics are described below.

248 – Fluvents – Fluvaquents, 0- 10 % slopes

This map unit is found in valley bottoms and low terraces along streams and rivers. The native vegetation is primarily trees, shrubs, and grasses. The elevations range between 4,000 and 7,200 feet. The average precipitation is between 5 and 14”, the average annual air temperature is 40 to 52 degrees F, and the average frost-free period is 80 to 140 days.

This unit is 50 percent fluvents and 50 percent fluvaquents. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used. Included in this soil map unit are small areas of upland drainages that occur without oxbows.

Fluvents are very deep and are well to somewhat poorly drained. They formed in alluvium derived predominantly from mixed sources. Textures range from sand to clay modified by various amounts of gravel, cobbles, and stones. Fluvents are subject to brief periods of flooding in the spring and early summer and are also subject to flooding during prolonged, high intensity storms. Channeling and deposition are common along streambanks.

Fluvaquents are very deep and are poorly and very poorly drained. They formed in alluvium derived predominantly from mixed sources. Textures range from sand to clay modified by various amounts of gravel, cobbles, and stones. Fluvaquents are subject to brief periods of flooding in the spring and early summer and are also subject to flooding during prolonged, high intensity storms. Channeling and deposition are common along streambanks. A permanent water table is at a depth of 3 feet and a seasonal high water table is at a depth of 0 to 12 inches in the spring.

375BE – Evanston Variant – Bowbells Variant complex, 0 to 60% slopes – 2/89

This map unit is found on gently sloping to very steep uplands and upland fans. The native vegetation is mainly grasses and shrubs. The elevations range from 5,500 to 7,200 feet. The average annual precipitation is 10 to 14 inches, the average annual air temperature is 40 to 45 degrees F, and the average frost-free period is 90 to 110 days.

The unit is 40 percent Evanston Variant sandy loam and 40 percent Bowbells Variant gravelly loam. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used. The other 20 percent of the unit is made up of small areas of Evanston loam, 0 to 15 percent slopes; Crago gravelly loam, 0 to 45 percent slopes; Clayburn loam, 2 to 50 percent slopes; Blazon loam, 10 to 60 percent slopes; Millerlake loam, 2 to 25 percent slopes; and wet, seepy or riparian areas.

The Evanston Variant soil is very deep and well drained. It formed in alluvium derived dominantly from sedimentary and igneous rock. Typically, the surface layer is brown sandy loam about 2 inches thick. The subsoil is greyish brown loam about 16 inches thick. The substratum to a depth of 6 inches or more is light brownish grey fine sandy loam and gravelly loam. Permeability of the Evanston variant soil is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is slow to rapid and **the hazard of water erosion is light to moderate.**

The Bowbells Variant soil is very deep and well drained. It formed in alluvium derived dominantly from sedimentary and igneous rock. Typically, the surface layer is dark greyish brown gravelly loam about 3 inches thick. The subsoil is brown very gravelly loam about 16 inches thick. The substratum to a depth of 60 inches or more is brown very gravelly loam. Permeability of the Bowbells Variant soil is moderately rapid. Available water capacity is moderate. Effective rooting depth is 60 inches or more. Runoff is slow to rapid and **the hazard of water erosion is slight to moderate.**

420AD - Attewan-Evanston complex, 0 to 30 percent slopes – 2/89

This map unit is found on nearly level to steep glacial-fluvial fans and terraces. The native vegetation is mainly grasses and shrubs. Elevation range from 5,500 to 7,200 feet. The average annual precipitation is 10 to 14 inches, the average annual air temperature is 40 to 45 degrees F., and the average frost-free period is 80 to 110 days.

This unit is 55 percent Attewan sandy loam and 25 percent Evanston loam. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used. The remaining 20 percent of the unit is made up of small areas of Carmody, Fraddle, Bosler variant, Zillman, Yamac, and Brownsto soils.

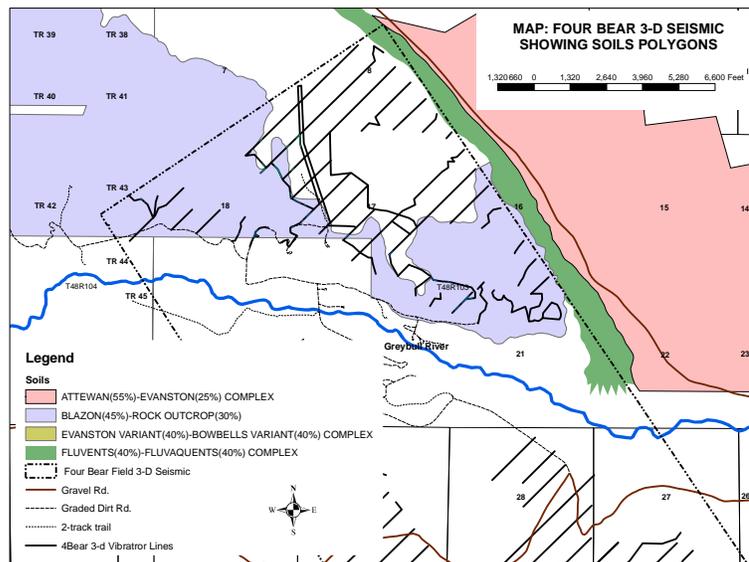
The Attewan soil is very deep and well drained. It formed in glacial-fluvial outwash derived dominantly from igneous and sedimentary rock. Typically, the surface layer is greyish brown sandy loam about 3 inches thick. The subsoil is greyish brown to light greyish brown loam about 17 inches thick. The upper 7 inches of the substratum is light grey loam. The lower part to a depth of 60 inches is light grey very gravelly sandy loam. Permeability of the Attewan soil is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is slow to rapid, and **the hazard of water erosion is light to severe.**

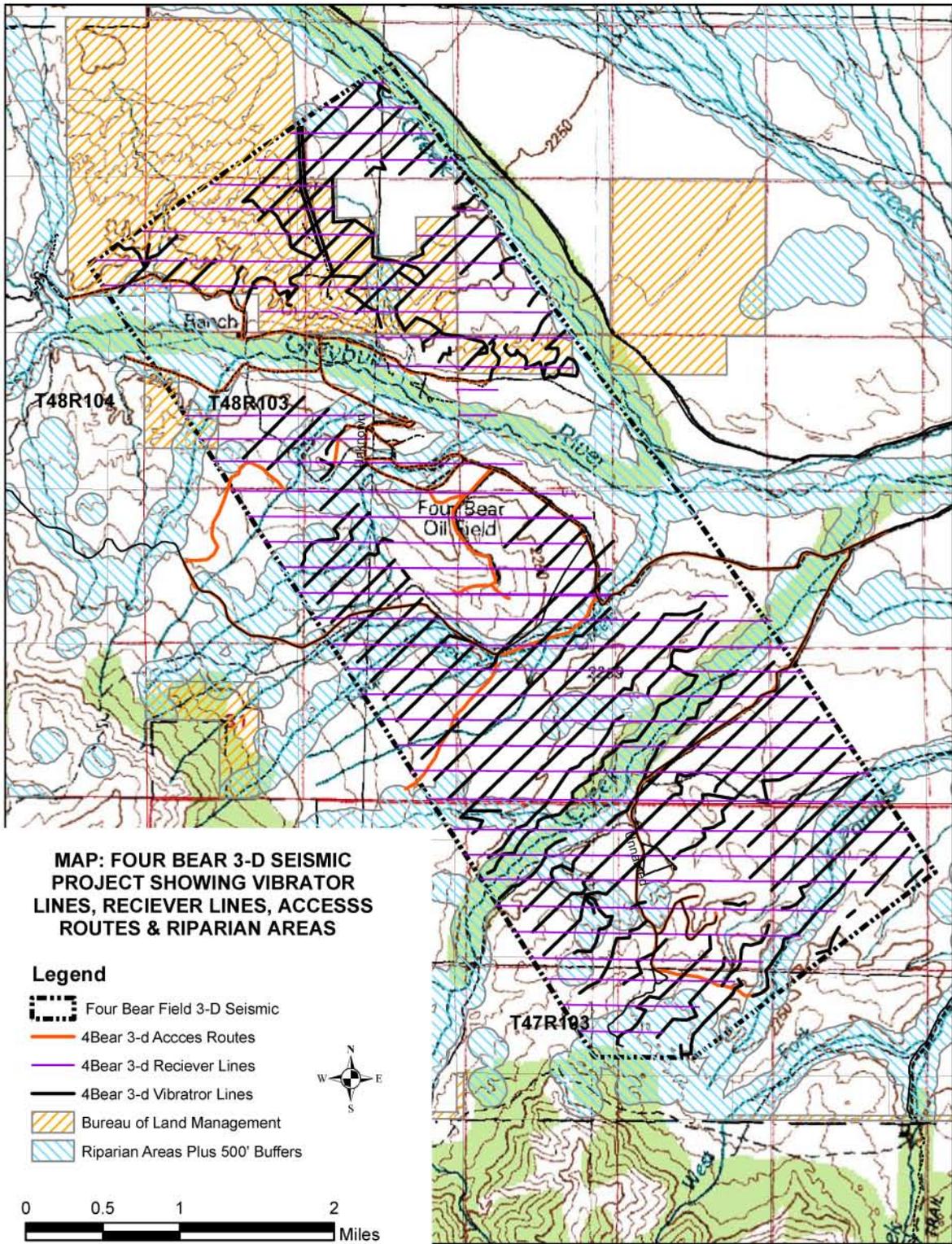
The Evanston soil is very deep and well drained. It formed in glacial-fluvial outwash derived dominantly from igneous and sedimentary rock. Typically, the surface layer is greyish brown loam about 2 inches thick. The subsoil is greyish brown clay loam about 16 inches thick. The substratum to a depth of 60 inches or more is very pale brown loam. Permeability of the Evanston soil is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is slow to rapid, and **the hazard of water erosion is slight to severe.**

1720--Blazon-Rock outcrop complex, 3 to 60 percent slopes

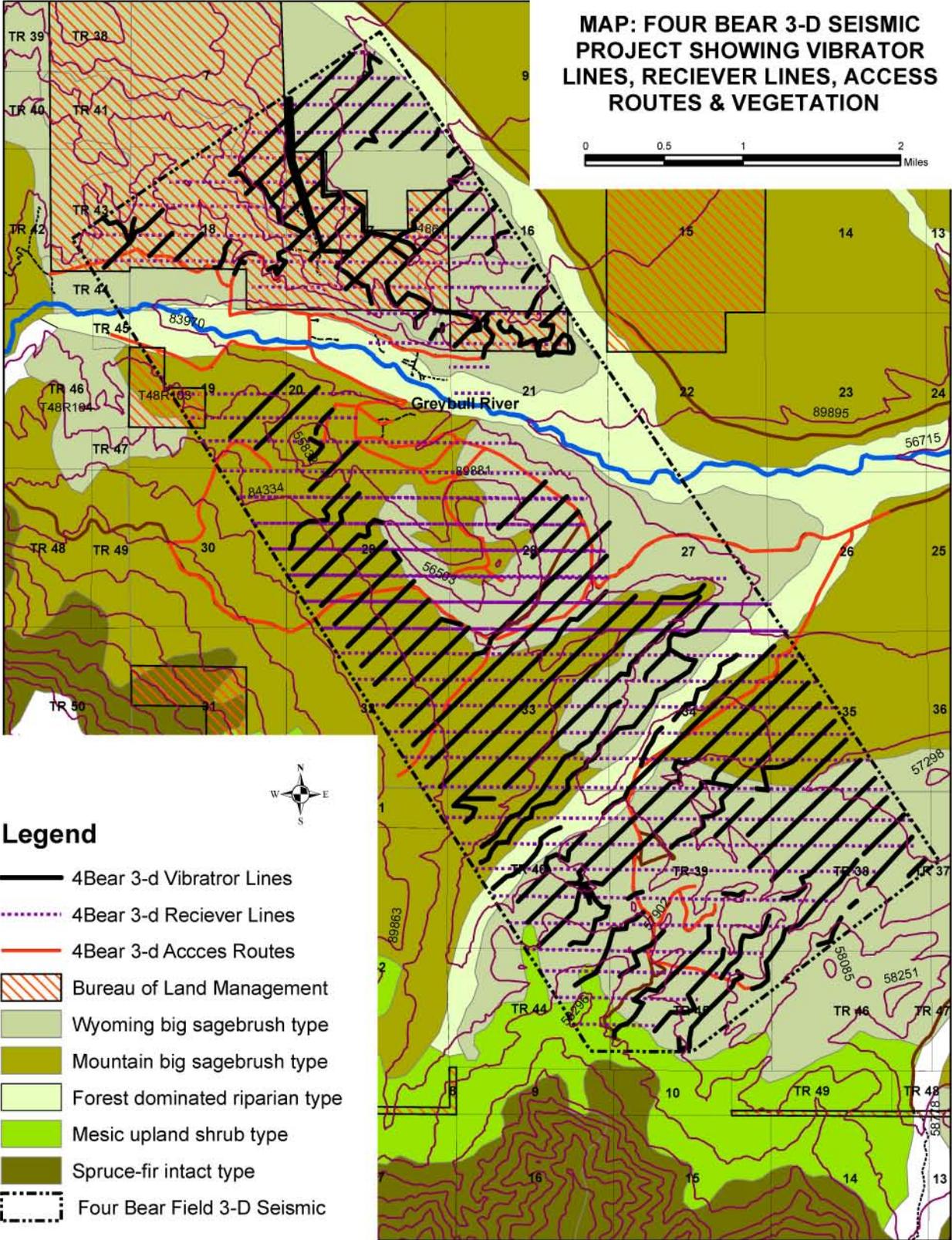
This map unit is found on gently sloping to very steep upland hills and ridges dissected by eroding intermittent drainages. Areas are irregular in shape and are 200 to 600 acres in size. The native vegetation is mainly grasses and shrubs. Elevation is between 5,500 to 7,200 feet. The average annual precipitation is 10 to 14 inches, the average annual air temperature is 38 to 43 degrees F, and the average frost-free period is 90 to 110 days.

This unit is 45 percent Blazon loam, 3 to 40 percent slopes, and 30 percent Rock outcrop. About 25 percent of the unit is made up of small areas of Diamondville loam, Blackhall sandy loam, Delphill loam, and Brownsto gravelly loam. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.





MAP: FOUR BEAR 3-D SEISMIC PROJECT SHOWING VIBRATOR LINES, RECIEVER LINES, ACCESS ROUTES & VEGETATION



Legend

-  4Bear 3-d Vibrator Lines
-  4Bear 3-d Reciever Lines
-  4Bear 3-d Acces Routes
-  Bureau of Land Management
-  Wyoming big sagebrush type
-  Mountain big sagebrush type
-  Forest dominated riparian type
-  Mesic upland shrub type
-  Spruce-fir intact type
-  Four Bear Field 3-D Seismic



The Blazon soil is shallow and well drained. It formed in loamy residuum derived dominantly from loamy shale and sandstone. Typically, the surface layer is brown loam about 3 inches thick. The underlying material to a depth of +/- 15 inches is very pale brown calcareous loam. Bedrock is at a depth of 15 inches. Permeability of the Blazon soil is moderate. Available water capacity is very low. Effective rooting depth is 10 to 20 inches. Runoff is medium to rapid and **the hazard of water erosion is moderate to very severe**. The hazard of soil blowing is moderate.

The Rock outcrop exposures consist of fine grained sandstone and loam shale.

Watershed and Water Resources

The project lies within the Greybull River hydrologic unit code #10080009, which is tributary to the Bighorn River hydrologic unit code #10080010. It encompasses an area that contains numerous springs, seeps, ponds, lakes, streams, and rivers including the Greybull River, Francs Fork, Picket Creek, Four Bear Creek, and Tera Creek, which is the only live stream known to exist on the public land within the project area. Tera Creek is fed by 2 or 3 springs that are also located on public land within the area. Other surface water occurs on public land primarily in the form of irrigation water. Most of the surface water resources within the project area are found on private and state land. According to the CYFO GIS NWI themes there are 170 acres of wetland within the project area and about 22 stream and/or river miles.

The project area contains some areas that have slopes in excess of 25%. The Wyoming BLM Standard Mitigation Guidelines for Surface Disturbing Activities recommends avoiding areas having slopes in excess of 25% to reduce the chance of increasing soil erosion. The majority of the project area is mapped as fragile soils per Map # 44 of the Draft Cody RMP, 1988 as are the majority of soils in the Cody Field Office.

Vegetative Resources

The project area’s relatively low rainfall and other climatic variables, combine to contribute to the development and maintenance of sagebrush steppe vegetation. Big sagebrush is present on most of the project area, with the exception of riparian areas. The brittle plant structure of sagebrush is more vulnerable to breakage than the more ductile grasses and forbs. Dispersed vibrator traffic as required in the conditions of approval, would result in more broken sage plants. The general vegetation types are shown below:

Primary / Secondary GAP Vegetation Type	Acres	Percent
Wyoming Big Sage Brush / Mixed Grass Prairie Type	3419	34
Wyoming Big Sage Brush / Basin Exposed Rock/Soil Type	1142	12
Wyoming Big Sage Brush / Mountain Big Sagebrush Type	1094	11
Mountain Big Sagebrush / Mixed Grass Prairie Type	2996	30
Forest Dominated Riparian / Irrigated Crop Type	1177	12
Mesic Upland Shrub / Mountain Big Sagebrush Type	135	1
Spruce-Fir Intact / Subalpine Meadow Type	15	t
Total	9978	100

Vegetation Information Per BLM Soil Descriptions – pertains to public land in north end of the project area

375 BE – Evanston Variant – Bowbells Variant complex, 0 to 60 % slopes

The Evanston variant part is in the loamy, 10 to 14 inch precipitation zone, range site. The Bowbells Variant part is in the Gravelly, 10 to 14 inch precipitation zone, range site. The potential plant community on this map unit consists mainly of bluebunch wheatgrass, rhizomatous wheatgrass, needle-and-thread, and big sagebrush. If the vegetation deteriorates, blue grama, threadleaf sedge, and black sagebrush increase. If the vegetation deteriorates further, annual grasses and weeds invade. The potential plant community produces about 400 pounds of air-dry vegetation per acre in normal years. Production varies from 600 pounds in favorable years to 250 pounds in unfavorable years.

420AD - Attewan-Evanston complex, 0 to 30 % slopes

The Attewan and Evanston soils are in the loamy, 10 to 14 inch precipitation zone, range site. The potential plant community on this unit is mainly bluebunch wheatgrass, rhizomatous wheatgrasses, needle-and-thread grass, and big sagebrush. If the vegetation deteriorates, big sagebrush, blue grama, junegrass, thread-leaf sedge and fringed sage increase. If the vegetation further deteriorates, prickly pear cactus and annual grasses and weeds invade. The potential plant community produces about 800 pounds of air-dry vegetation per acre in normal years. Production varies from 1100 pounds in favorable years to 500 pounds in unfavorable years

1720 - Blazon-Rock outcrop complex, 3 to 60 % slopes

The Blazon part is in the shallow loamy, 10 to 14 inch precipitation zone, range site. The potential plant community on the Blazon soil is mainly bluebunch wheatgrass, needleandthread, prairie junegrass, and big sagebrush. If the vegetation deteriorates, blue grama, Sandberg's bluegrass, and forbs increase. If the vegetation further deteriorates, annual grasses and weeds invade. The present vegetation in most areas is mainly Idaho fescue, bluebunch wheatgrass, lupine, big sagebrush, juniper, and limber pine. The potential plant community produces about 500 pounds of air-dry, vegetation per acre in normal years. Production varies from 700 pounds in favorable years to 350 pounds in unfavorable years. Production is limited on this soil due to shallow depth.

248 – Fluvents and Fluvaquents, 0 – 10 % slopes

These soils are found along streams and on low terraces adjacent to floodplains, etc. and usually support wetland and/or riparian vegetation that consists primarily of grasses, shrubs, and trees that can tolerate occasional, periodic, and/or prolonged flooding. Vegetation on these sites is quite variable and depends on a combination of factors that determine the potential of the site. Some sites will be limited to only herbaceous plant species such as Nebraska sedge, tri-square bulrush, alkali bulrush, water sedge, beaked sedge, or Baltic rush, etc. Other sites will have the potential to support a mix of willow, waterbirch, alder, or other shrubs and usually support an herbaceous understory. Still other sites will have the potential for a mix of cottonwood, various shrubs, and herbaceous plants. The productivity of these sites can vary widely depending on the plant species present and the condition of the site.

Livestock Grazing - The entire project area is grazed by livestock. The project is located on two BLM grazing allotments: the Palette - Allotment No. 03039 (parts of Sections 7, 17, 18, & 19, T48N, R103W), and the Pitchfork Allotment No 02532 (part of Section 21, T48N, R103W). The Palette has an active preference of 344 cattle on 1,858 federal acres, or about 5.4 acres per Animal Unit Month (AUM). The Pitchfork has an active preference of 1,245 cattle on 15,932 federal acres, or about 4.8 acres per Animal Unit Month (AUM).

Wildlife Resources – Big game including mule deer, elk and antelope are known to use the area. The project area occupies crucial big game winter range and elk parturition areas, where seasonal disturbance or use is restricted between November 15 and June 30. However, the federal part of the project does not

include parturition areas. Seasonal restrictions on disturbing activities should minimize affects to game animals. Some displacement of deer, elk and antelope could occur but should be a temporary affect and abundant suitable habitat is nearby the project area minimizing the effects of displacement.

There have been some reports of grizzly bears on the ridges north and west of the project area and along the Greybull river, but the Wyoming Game and Fish Department has no confirmed sightings within the project boundary area. The project area is not in the recovery zone, but it is within the ten mile buffer where mortality would be counted against allowable take. Human –grizzly bear conflicts have been uncommon in this area and have not occurred on BLM lands. Bear use near the project would be primarily during spring and early summer. Grizzly bears generally move up to higher elevation and more montane habitats during summer and fall. A project like this would not last long enough to habituate bears to humans. Potential for bear-human conflicts related to this project activities are very low. Helicopters and vehicles are generally avoided by bears. The project will take place in very open country with very good distance visibility allowing both humans and bears good buffer distances to avoid conflicts. Work crews will be required to have bear deterrent pepper spray available for use during work activities and food and attractants will be required to be stored in a manner that they are unavailable to bears. Attached stipulations would minimize any potential for human-grizzly bear conflicts related to this project. Timing restrictions limit this project to periods when the potential for grizzly bears use of this area is very low.

Sage grouse would be expected to use some lands in the project area, but the nearest known lek is at least ten miles to the east. It is not know whether or not nesting occurs in the project area, but adjacent hay meadows would make the area a potential productive nesting and brooding area. Seasonal restrictions limit potential disturbance to time periods when sage grouse are mobile. Grouse could be temporarily displaced during seismic activities but have abundant habitat in adjacent areas that could be occupied during project activities.

Gray wolves have been observed on several occasions on the Shoshone National Forest, on Carter Mountain and have been seen along both sides of the Greybull River. These wolves are considered part of an experimental, non-essential population that was reintroduced to the Greater Yellowstone Ecosystem in 1994. There are no known den sites in close proximity to the project area. The Greybull river pack has a large territory that would include the project area, but does not spend much time near the Four Bear oilfield due to human presence and activity.

Bald eagles have been observed along the Greybull river but most observations have been in fall and winter periods. There are no known nesting sites along the Greybull river. Observations of bald eagles have been infrequent. With seasonal period restrictions in place, this project should not affect bald eagles. Golden eagles are common in this area, but do not have any known nest sites within 3 miles of this project site. Project activities should have very little affect to golden eagles and other raptors. The project would not occur during nesting periods for raptors and migratory birds.

The grizzly bear, black-footed ferret, and bald eagle are listed, proposed or petitioned as Threatened and Endangered Species pursuant to the Endangered Species Act. This imposes certain obligations on the BLM; they are shown below on the table along with the actions taken and the reasons for doing so. Other special status species like mountain plover, sage grouse, long-billed curlews, white-tailed prairie dogs, and bats are managed to maintain or enhance populations and habitats under BLM policy. The proposed action is limited to periods outside of important reproductive cycles for special status species to avoid potential impacts.

TABLE 21 – ENDANGERED SPECIES ACT CONSULTATION SUMMARY				
Species	Legal Status	Legally Mandated Management & Consultation	Management Actions Taken	Rationale
Grizzly Bear	On T&E List Threatened	Must consult with F&WS* if action affects bears, occurs in seasonally occupied habitat; must avoid adverse impacts to species and habitat.	No overnight storage of food that might attract grizzly bears. BLM to be notified if grizzly bears are observed during activities. Informal consultation. Action determined to not likely adversely affect (NLAA) grizzly bears.	No confirmed record of grizzlies in project area. Bear deterrent spray available to work crews. Activities generally avoided by bears, and will occur outside of bear use periods.
Gray wolf	Exp pop	Must consult if actions could jeopardize the experimental population in Yellowstone area	Actions would not likely adversely affect wolves or jeopardize the experimental population.	Wolves are highly mobile and would avoid the area during activities. No special habitat in area.
Bald Eagle	T&E listed, formerly listed	Must consult if action affects species or nesting habitat. Also protected under Migratory Bird Act.	Timing stip restriction applied to protect nesting habitat. (March 1-July 31)	Eagles not affected by project. Project would occur after nesting period for all raptors.
Black-footed ferret	Endangered, T&E listed	Must consult if action affects the species or critical habitat. Adverse affects must be avoided or mitigated.	Avoid destruction of active prairie dog burrows. Notify BLM if any signs of ferrets are observed during operations	Ferrets removed from this area in 1985 and are currently not known to occur in this area. Prairie dog colonies & habitat outside of proposed project area.

* U. S. Fish and Wildlife Service

Fisheries

The Greybull River, Francs Fork, and Pickett Creek provide habitat for several cold-water native fish species, including the mountain whitefish, mountain sucker, long-nosed dace, Snake River cutthroat trout, and the Yellowstone River cutthroat trout, which is a BLM Sensitive species. Several Wyoming Environmental Groups recently sued the USF&WS for finding that the Yellowstone River cutthroat trout did not warrant being listed as a Threatened or Endangered Species pursuant to the Endangered Species Act. This may result in the USF&WS taking a closer look at this fish species to determine whether it needs to be listed. In the mean time, activities that BLM authorize that have potential to negatively affect the cold-water fish habitat in the Greybull River, Francs Fork, and Pickett Creek should be managed to minimize the potential for any negative affects. Restrictions on activities adjacent to water/riparian zones would minimize direct impacts to fisheries habitat and avoid potential for affecting riparian zones.

Recreation – The project area is in a Class IV Visual Resource Management area; The ridges are forested or in prairie, but are not high enough and rugged enough to make this area highly scenic as the Carter Mountain ACEC. The state lands are available for hunting. Federal lands in the project area are available for public use, but there is no direct public access to the BLM project area. Big game hunting is the primary recreation use on public lands.

Cultural Resources – The project area received extensive pre-Columbian use. Quite a number of National Register Eligible sites were found in the Class III inventory that was done in preparation for this permit. Cultural resource evaluation revealed no eligible historic properties within the area of potential effect (APE) of this project. No known National Register or NR eligible properties will be adversely affected by the project. There are no potentially ‘at risk’ historic properties located in areas incidental to the project. No impacts are anticipated.

4. ENVIRONMENTAL CONSEQUENCES

The environmental consequences are discussed in this section. Those related to Appendix “B” of the Cody RMP/ROD are summarized below in Table 25 and discussed further in the narrative as appropriate.

EFFECTS ON SPECIAL RESOURCE VALUES		
RESOURCE VALUE (Pg. #)	PROPOSED ACTION	NO ACTION
Cultural and Paleontological Resources (Pg. 64 of Cody RMP/ROD)	Long term visual effects of this project are minuscule when compared with features already present. In the mostly pristine BLM surface area north of the Greybull river , all access would be by helicopter and the total cross section of all shot holes north of the Greybull river (four to five square miles of the project area) is five square feet – roughly a circle less than 32” in diameter. Impacts and mitigation were developed in consultation with the Wyoming State Historical Preservation Office (SHPO).	NEFPA*
Riparian Areas and Surface Water (Pg. 64 of Cody RMP/ROD)	Avoidance of riparian areas and a 500 foot setback from the Greybull river. As noted in the affected environment, the rivers like this are often muddy because of runoff from diluvian storm events occurring on steep, volcanic headwaters. Because of low pressure tires and, mandates limiting vehicular use to dry conditions, sediment loading from buggy traffic would be miniscule. This meets the criteria that the project is necessary and can be mitigated.	NEFPA*
Soil and Watershed Values (Pg. 64 of Cody RMP/ROD)	The RMP allows timber cutting on slopes as steep as 45%. Impacts from operating vibrator drills on slopes less than 30% is considerably less than impacts that would occur in logging activities as discussed in this RMP reference, where a substantial number of logs are often skidded on slopes up to 45% in areas that could encompass ten or more acres.	NEFPA*
Wildlife: Recovery Habitat for Black-Footed Ferrets, Swift Fox & Other Special Status Species (Pg 65 of Cody RMP/ROD)	Includes Grizzly bears; wolves are an experimental population and need no further consideration except if a take would be expected. Stips designed to minimize potential for human –grizzly bear conflicts. Wandering wolves or grizzlies may alter their course if they happen to wander through the project area during the brief time it takes to complete the project. Neither species is likely to be adversely affected by this action. (NLAA). Black footed ferrets no longer known to occupy suitable habitat in the area. Prairie dog colonies not established within the project area. This would not constitute an effect to either species. Bald eagles not likely to use the project area except in mild winters. Seasonal timing restrictions minimize any potential for project to affect bald eagles. Not affected	NEFPA*
Wildlife: Big Game(Pg 65 of Cody RMP/ROD)	Seasonal operations window (8/1 – 11/15) protects this concern. Secondary window (mid-January -2/28) provides adequate protection for wintering big game because of short duration (total of 2-4 days) in crucial winter range and ability to adjust to seasonal weather and habitat conditions to minimize potential disturbance..	NEFPA*

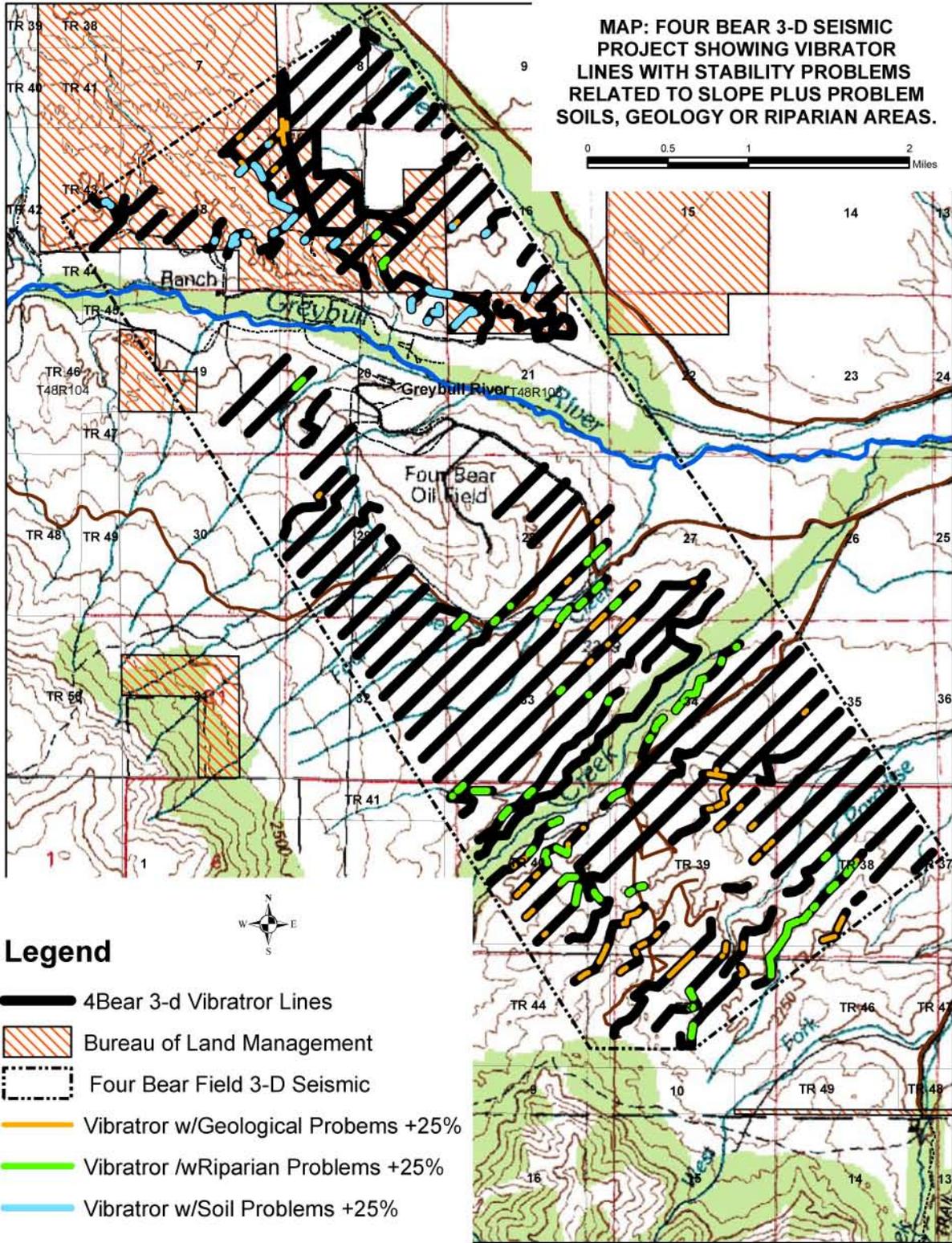
* *No Effect from the Proposed Action*

EFFECTS - PROPOSED ACTION

Stability, Soils, & Watershed

The section deals with geologic instability, soil erosion and compaction and the potential indirect effect to the watershed from these actions. About four miles of the total 88 miles of vibrator line cross lands with both steep slopes and unstable geology. On BLM surface about 1/3 mile of vibrator line crosses geologically unstable areas. Some churning of soil could occur particularly on steep slopes on unconsolidated soils. This could cause some erosion, but because the sod shifts but is not eliminated, effects should be slight. Reclamation measures further limit any long term effects. High risk areas generally include sensitive soils on steep slopes: about 2/3 mile of line is vulnerable on BLM surface. Soils data, other than that of a general nature, is not available on non-BLM lands within the proposed project area.

MAP: FOUR BEAR 3-D SEISMIC PROJECT SHOWING VIBRATOR LINES WITH STABILITY PROBLEMS RELATED TO SLOPE PLUS PROBLEM SOILS, GEOLOGY OR RIPARIAN AREAS.



Legend

-  4Bear 3-d Vibrator Lines
-  Bureau of Land Management
-  Four Bear Field 3-D Seismic
-  Vibrator w/Geological Problems +25%
-  Vibrator w/Riparian Problems +25%
-  Vibrator w/Soil Problems +25%

Because of low pressure tires and the condition of approval that limits vehicular use to dry conditions, sediment loading resulting from increased erosion caused by vibrators would be low. Even though vibrating occurs within 500 feet of a few small riparian/wetland areas, the 500 foot set back is enforced on the Greybull River. Maintaining 500' set back from the Greybull River and avoiding riparian areas protects surface water and riparian and aquatic habitats from direct impact. Surface disturbances that occur on adjacent uplands or uplands in the watershed could have indirect negative effects on the aquatic environment, including fish habitat. Vibrators cross a total of 2.5 miles of lands with steep slopes and adjacency to riparian areas. These are the problem areas where sediment loss could affect riparian areas, but would be conditioned by factors discussed above.

The heaviest traffic is a vibrator whose PSI is identical to that of a pick-up truck. Even though the tonnage of vibrators (31.5 T. per machine) is high, the reduced PSI plus the dispersed traffic pattern and the single pass in most cases, combine to limit compaction. There may be isolated churning on steep slopes by vibrators. There may also be minimal rutting deeper than the three inches prescribed in the COA's but reclamation requirements would mitigate this concern. The timbers used to cross dry gullies would not cause serious erosion problems because they would be removed when not in use. Even if a storm occurs while they are in place, in most cases, they would simply float down stream. However, there is always a possibility they could get jammed up and create substantial problems.

Vegetation Resources And Use – Generally on grass lands, vegetation damage from compaction that occurs in one growing season is barely noticeable after two seasons. This is based on a study initiated and funded by the Bureau of Land Management that studied effects of vibroseis prospects on prairie dog communities and their immediate environs. ("The Effects of Vibroseis of White-tailed prairie dog populations on the Laramie Plains of Wyoming", 1985; George E. Menkens and Stanley H. Anderson; Wyoming Cooperative Research Unit, Laramie, WY 82071).

However, sage brush is present in more than ¾ of the project area on BLM administered lands. In these areas, the woody sage brush branches will be bent and, in many cases be broken. This coupled with the prolonged drought, could severely affect and even kill some plants.

Impacts to grazing amount to less than 90 acres; this impact consists of a round trip with a vibrator and some ATV traffic, mostly to support surveyors. Because of the season of use, activities would affect mostly dormant vegetation in late summer; re-growth would take place the following spring. Of course, vehicular use on jeep trails or roads would not affect vegetation in this way.

There is a potential for the introduction and propagation of noxious weeds. Conditions of approval requiring the pressure washing of equipment prior to entry and prompt reseeding of disturbed areas would limit this possibility.

Wildlife Resources – Effects on big game are expected to be minimal because the project is being completed between late summer and early winter and because it has a light foot print and lasts only a few weeks. A project of this limited impact and short duration could probably be completed with limited impacts during the fall when wildlife use is reduced. Hunting for most game animals in this area would have a much greater affect on distribution and movements of game animals. A more detailed breakdown of effects on individual species is shown below.

Elk, mule deer and other big game – If they are present, elk could move in response to helicopter use. Late fall or early winter use at this level would have little or no effect on successful winter survival or parturition of big game in the project area, even if the project extended well into December. Some attrition (annual game harvest) is already expected from late fall and early winter hunting. . Any

movement of elk or mule deer for that brief a time would not adversely affect health of big game herds using this crucial winter range. This mitigation meets special management and RMP requirements (see Lines 1 and 12 of Table 25).

There are no known nest sites for raptors in the project area. However, seasonal restrictions would limit project activities to periods outside of the nesting period for raptors and ground nesting migratory birds. Bald eagles are unlikely to use the project area except during mild winter periods. Seasonal timing restrictions avoid project activities during bald eagle occupation periods.

Grizzly Bear - Food storage requirements would prevent the attraction of grizzly bears to the project area if one happened to be in the area. Timing restrictions limit the project to periods when bears would be very unlikely to occupy any part of the project area. Even if present, bears would avoid all project activities. Human and helicopter presence related to this project could temporarily cause grizzlies or black bears to move away from the project if they happen to be in the area. However the potential for attraction/encounter could be avoided even if a grizzlies or black bears were in the area. Unlike hikers or back packers, seismic crews enjoy helicopter support so that any bear in the sparse timber would be quickly spotted so appropriate avoidance measures could be taken. Grizzly bears would not likely be adversely affected (NLAA) by the project. This mitigation meets RMP requirements (see Line 11 of Table 25).

Gray Wolf - Although wolves could occupy the project area on a temporary basis, wolves would avoid human activities. There is no known important den or territorial habitat in the project area. Wolves would not be affected by this project and the project would not jeopardize the continued existence of the experimental wolf population in the Yellowstone area. This mitigation meets RMP requirements (see Line 11 of Table 25).

Fisheries

Following the procedures outlined in the proposed action along with the attached stipulations and mitigation is expected to minimize the potential for negative affects to upland vegetation and soils, which could negatively influence the cold-water fish habitat in the Greybull River, Francs Fork, and Pickett Creek.

Recreation – Helicopter use incidental to shooting and recording could have a slight impact on recreation users, particularly hunters. Lines may attract use as new jeep trails, but it is doubtful since public, vehicular access is limited and non-existent on BLM surface.

Cultural Resources - Cultural resource evaluation revealed no eligible historic properties within the area of potential effect (APE) of this project. All sites are avoided. No known National Register or NR eligible properties will be adversely affected by the project. There are no potentially 'at risk' historic properties located in areas incidental to the project. No impacts are anticipated.

The potential for effects to cultural and paleontological resources inadvertently discovered during completion of the project would be minimized by measures included in the conditions of approval, including the Class III inventory. These measures also require that work would be stopped and evaluations completed if unexpected artifacts are discovered. The passage of four-wheelers during initial surveys and for trouble shooting would have no potential to affect on National Register Eligible sites. This is due to the few trips, the lightweight of the ATVs and the low ground pressures exerted by the low-pressure tires (see Table 2, above).

EFFECTS - NO ACTION ALTERNATIVE

The environmental consequences of the No Action Alternative are considered below. In temporal context of one year the No Action may be slightly less impacting than the Proposed Action. In a longer temporal context of a decade there is virtually no difference between the two alternatives. However, in the longer context, a progression of development could occur; it is discussed under cumulative effects.

Soils, Watershed & Ground Water – Existing uses like expanding trail use, agricultural use, and grazing continue to impact values.

Vegetative Resources and Use – Grazing use continues. Weeds would continue to be a problem in some areas.

Wildlife Resources – Bald eagles, wolves and grizzly bear continue to repatriate areas abandoned in the late 19th and 20th centuries. Hunting as regulated by Wyoming Game and Fish Department would continue to affect big game populations, but only as intended to control herd sizes and provide recreational opportunities. Wildlife species would continue to utilize the area as important winter range and reproductive habitat. Special status species would be surveyed periodically but no expected changes in current status are likely to occur.

Recreation – Accepted recreation use can affect solitude for some users. The pattern of off highway vehicle (OHV) trails can be expected to gradually increase over time.

Cultural Resources – Compaction from livestock and wildlife and very occasional theft of artifacts would have a slight impact on cultural resources. The expected expansion of trail use would continue to impact known and unknown cultural sites.

Native Religious Concerns – All current uses would continue; their impacts on Native American Religious concerns would remain unknown.

CUMULATIVE EFFECTS

Proposed Action - The discussion of cumulative effects attempts to address concerns expressed about future development. It is general and somewhat speculative since the Cody Field Office currently has only the 3-D seismic permit to consider. Approval of the permit does not convey any future right to develop oil and gas resources in the project area, that right has already been given by issuance of oil and gas leases pursuant to the Cody RMP/ROD. However, the information provided by the prospect can materially reduce the number of wells needed to develop the resource.

This information, along with directional drilling technology, allows an energy company to develop reserves with minimal disturbance. If this is not possible, disturbed acreage could be two to three times that, possibly more

The Proposed Action, because it encourages geophysical exploration, is the most likely of the alternatives to promote the technology that effectively limits surface disturbance. The immediate environmental cost of long term benefit would be some woody vegetation bent and slightly broken so that forage values would be diminished for wildlife and livestock during the winter.

No Action – The “No Action” alternative raises an interesting issue: if, to protect environmental values, geophysical activities would be disallowed in an area open for leasing where leases have already been

issued, drilling could be precluded or the lessees could be forced to drill without critical information about the targeted structure.

CONSULTATION AND COORDINATION - Because of the nature of the proposed action the assessment was made available for a thirty (30) day public comment period. The Wyoming State Historic Preservation Officer was consulted. The Wyoming Game and Fish Department provided input on grizzlies and other wildlife. The U. S. Fish and Wildlife Service were contacted on grizzly bears, the gray wolf and Black footed ferrets.

TERMS & CONDITIONS

Lease/Serial/Case File No: WYW-162984		EA Number: WY-020-E06-E06	
Proposed Action: Four Bear Field 3-D (Vibroseis)			
Applicant (if any): Nance Petroleum Corporation			
TN. 48 N.	RGE. 103, 104 W.	SEC(S): var.	
Author: Vic Seefeldt		Date: August 7, 2006	

Applicant Address:			
City:	State:	Zip:	Phone:
Party Chief:	Phone:	Cell Phone:	

1. Cultural Resources, Standard Stipulation Nance Petroleum is responsible for informing all persons associated with this project that they may be subject to prosecution for knowingly damaging, altering, excavating or removing any archaeological, historical, or vertebrate fossil objects or site. If archaeological, historical, Native American, or vertebrate fossil materials are discovered; Trace is to suspend all operations that further disturb such materials and immediately contact the Authorized Officer. Operations are not to resume until written authorization to proceed is issued by the Authorized Officer (AO).

The authorized officer will evaluate, or will have evaluated such discoveries not later than five working days after being notified, and will determine what action shall be taken with respect to such discoveries. The decision as to the appropriate measures to mitigate adverse effects to significant cultural or Paleontological resources will be made by the authorized officer after consulting with the operator/holder.

The operator/holder is responsible for the cost of any investigations necessary for the evaluation, and any mitigative measures required by the Authorized Officer. The AO will provide technical and procedural guidelines for the conduct of evaluation and mitigation. Upon verification from the AO that the required evaluation and/or mitigation has been completed, the operator will be allowed to resume operations.

Native American Resources The area under consideration contains no known areas or locations of religious or cultural concern to Native Americans. If such areas are subsequently identified or become known through the Native American notification or consultation process they would be considered during the implementation phase. The BLM would take no action that would adversely affect these areas or locations without consultation with the appropriate Native Americans.

Human Remains If human remains are discovered or suspected the operator/holder shall suspend operations immediately, physically guard the area, and notify BLM immediately.

2. The BLM shall be notified by the operator at least 3 days, and no more than 14 days, before entering onto public lands. If conditions have changed, additional Terms and Conditions may be necessary.
3. Operations shall be suspended when the soil is saturated or during periods when significant watershed damage (e.g., rutting, extensive sheet soil erosion, formation or rills/gullies, etc) is likely to occur. Creation of ruts in excess of 3 inches is generally unacceptable, except in rare

situations such as emergencies or unexpectedly soft soils. The operator is expected to avoid areas where changed vegetation, topography or other indicators suggest vehicular travel could create ruts greater than 3 inches in depth.

4. A copy of the NOI and Terms and Conditions shall be kept in the field with each crew. The operator shall notify the AO, in writing, of any changes in the original notice and secure written approval for the changes before proceeding.
5. Due care must be taken to safeguard all livestock and wildlife in the vicinity of the exploration operations. Any unusual wildlife sightings (i.e. concentrations of animals of uncommon species) shall immediately be brought to the attention of the AO. All activities in the vicinity of such sightings shall be suspended until it is determined if threatened/endangered species or protected animals or plants may be affected. The BLM will evaluate these discoveries within five working days of being notified. Measures to mitigate adverse effects on protected or threatened/endangered species will be determined by the AO after consultation with the operator.
6. Range improvements (fences, reservoirs, etc) or land treatment projects (contour furrowing, seeding, or range monitoring sites) shall not be disturbed or altered.
7. All fires set or caused as a result of these exploration operations shall be extinguished without expense to the government. All fires shall be reported to the AO as soon as possible. All ATVs will be equipped with spark arresters and fire extinguishers. A self-loading water bucket that allows helicopter transport of water from the Sunshine Reservoir or another nearby source will be kept at the staging area.
8. Advanced written permission (Permit for Use of Earthmoving Equipment During Geophysical Operations, Form WY-3150-3) shall be obtained before conducting surface disturbing activities. This includes, but is not limited to blading, dozing, snow removal, and vegetation removal. This may involve additional delay.
9. Reclamation of disturbed areas shall be done concurrently with the geophysical operation, insofar as possible. All disturbed areas shall be reseeded, as directed by the AO, until adequate vegetative cover is established. All trash, flagging, lath, etc. shall be removed and hauled to an authorized disposal site. No oil or lubricants shall be drained onto the ground surface. The operator shall notify the AO of the date operations are completed. Where rutting has occurred that could result in erosion and long term instability, the operator will install silt fences, weed free hay bales or other approved runoff diversion features. A Notice of Completion (NOC 3150-4) shall be filed within 30 days of completion of operations.
10. Weed Management – Pedestrian crews will keep shoes and clothing free of weed seed and report any weed infestations they discover. Before bringing construction equipment into the oil field the operator will spray it to remove weed seeds. This may be done with high pressure air or by a water power wash at an appropriate facility. The spraying will employ a place and method that ensures that the detached weed seeds are contained so they do not infest new areas.
11. Crossings of dry gullies may be built up with timbers that are free of toxic substances like creosote. They will be removed from the gullies during any inactive period of two weeks or more. All timbers will be removed from federal lands at completion of the project.
12. Vibrator traffic will avoid a 500' buffer from the Greybull river and all riparian areas as indicated by uncommonly lush herbaceous or woody vegetation such as briars, cottonwoods, tall grasses,

cattails, etc. (Pertinent plant species include all Obligate Wetland and Facultative Wetland plant species per The National List of Plant Species that Occur in Wetlands: Northwest, USF&WS Biological Report 88(26.9), May 1988 and December 1993 Supplement.

13. Vibrators will be staggered to avoid compaction that could occur when two or more such vehicles pass in the same tracks.
14. Bear Stipulation – Each worker will carry a fully operational canister of bear repellent while on the project. Food will not be left unattended except where it is stored in a hard sided vehicle, trailer or building. All food, refuse or other things attractive to bears will be removed from the project area at the close of every working day. All bear sightings will be reported to Dennis Saville, the Cody BLM biologist (307/578-5926) within 24 hours.

IF UNANTICIPATED CONCERNS ARISE, ADDITIONAL MEASURES MAY BE NECESSARY. THEY WILL NOT UNREASONABLY INTERFERE WITH EXECUTION OF THE PROJECT. I HAVE BEEN INFORMED OF THE TERMS AND CONDITIONS UNDER WHICH THESE EXPLORATION OPERATIONS WILL BE CONDUCTED.

Signature of Party Chief /Date