APPENDIX "A"

Surface and Mineral Owners

Beaver Creek Ranch

Surface Owners:

Richard W. Leavitt

626 2nd Ave. N.

Greybull, Wyoming 82426

Mineral Owners:

Richard W. Leavitt

626 2nd Ave. N.

Greybull, Wyoming 82426

Brenton C. Leavitt

425 4th Ave. N.

Greybull, Wyoming 82426

Ruth M. Leavitt

202 4th St.

Greybull, Wyoming 82426

Permit No. 624(5)

Temporary Filing No. 2 4/134

DEQ 3 - 001

APPENDIX "B"

Adjacent Surface Rights

i. Bureau of Land Management

Richard W. Leavitt

626 2nd Ave. N.

Greybull, Wyoming 82426

Dresser Industries, Inc.
(MI Drilling Fluids, Inc.)
PO Box 832
Greybull, Wy 82426

ii. Bureau of Land Management

MI Drilling Fluids, Inc.

Permit No. 624(S)

Temporary Filing No. 24/134

DEQ 3 - 002

See File Folder 1 of 1 Right Side for app "C"
RC
2-10-89

APPENDIX "C"

Permit No. 624(S)

Temporary Filing No. 24134

DEQ 3 - 003

LQD

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APPENDIX "C"

This Appendix "C" presents the location of lands by legal description, section, township, range, county, and municipal corporation, if any, [W.S. § 35-11-406 (a)(vi)] and the number of acres in each description. No mining may take place on land for which there is not in effect a valid mining permit (W.S. § 35-11-405). To include additional lands within a permit area it is necessary to amend the permit [W.S. § 35-11-406 (a)(xii)], so care should be taken to include all lands necessary to the mining and reclamation operation as defined in W.S. § 35-11-103 (e)(vii). All acreage figures should be obtained from official survey documents of recent surveys if available. An original U.S.G.S. topographic map with the permit area clearly outlined should accompany each permit application.

NWSW	Section 1	T. 53 N	R. 93 W	Acres 40
N½S½	Section 2	T. 53 N	R. 93 W	Acres 160
E½SENE	Section 2	T. 53 N	R. 93 W	Acres 20
E½W½SENE	Section 2	T. 53 N	R. 93 W	Acres 10
E½E½SENE	Section 2	T. 53 N	R. 93 W	Acres 5
	Section	T. N	R. W	Acres
	Section	T. N	R. W	Acres
	Section	T. N	R. W	Acres
	Section	T. N	R. W	Acres
	Section	T. N	R. W	Acres
	Section	T. N	R. W	Acres
	Section	T. N	R. W	Acres
	Section	T. N	R. W	Acres
	Section	T. N	R. W	Acres
	Section	T. N	R. W	Acres
	Section	T. N	R. W	Acres

COUNTY of Big Horn

Municipal Corporation

Subtotal Above Acres 235

Total Permit (Amendment) Acres 235

Reviewed (Compiled)

WDEQ/LQD BRW

Date 11/15/2001

Permit No. 624(s)

Applicant Signature

Date 11/10/2011

TFN 5 1/268

11/2011 - 624(s)

DEQ13 - 004

5 1/268

SURFACE LANDOWNERS'S CONSENT

I, Richard W. Leavitt, CERTIFY that I hold surface rights on certain lands on which Richard W. Leavitt, Brenton Leavitt, and Ruth M. Leavitt holds mineral estate rights, on the following lands:

$NE\frac{1}{4}$, $N\frac{1}{2}SW\frac{1}{4}$, Section 2, T. 53 N., R. 93 W. 6 P.M.

$N\frac{1}{2}SE\frac{1}{4}$, Section 2, T. 53 N., R. 93 W. 6 P.M.

$W\frac{1}{2}NW\frac{1}{4}$, Section 1, T. 53 N., R. 93 W. 6 P.M.

$NW\frac{1}{4}SW\frac{1}{4}$, Section 1, T. 53 N., R. 93 W. 6 P.M.

I have examined the mining plans and reclamation plan prepared by Kenneth E. Tanner in compliance with the Wyoming ENVIRONMENTAL QUALITY ACT of 1973 as amended, and do hereby approve said plans, and give my consent to enter and carry out said mining and reclamation programs on said lands as proposed therein.

Dated this _____ day of _____, 1989.

Richard W Leavitt

Surface Landowner
Richard W. Leavitt

Witness:

Brenda K. Kunkle

Dana Ann Harris

Permit No. 624(S)

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DEQ 3 - 005

DESCRIPTION OF THE LAND

Appendix "D"

1. a. Past Land Use

The area has historically been used for native wildlife grazing. Since settlement, during the spring and fall the land has been used for domestic livestock grazing.

b. Present Land Use

The land is presently used in the spring and fall for limited domestic livestock grazing.

c. Post-mining Land Use

All lands will be returned to their present use of limited grazing and wildlife habitat.

2. History of the Area

The Big Horn Basin was practically unknown until 1879, when the cattle kings moved in with large herds of long-horned cattle. The cattle kings overgrazed the land and withdrew within ten years. This created a void which was filled by smaller operators who were looking for permanent homes. Around 1890, several families had started homesteads on the fringes of the Basin. The Burlington railroad extended into the Basin, reaching Cody in 1901. The first settlers in the area started showing up around 1884. There are no known historical sites within the permit area.

3. Archeological Resources

There are no known archeological resources within the permit area.

4. Climetology

a. Meterological Data

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Records of the U. S. Weather Bureau at Basin, Wyoming show the annual precipitation for the area to be 7.3 inches a year. The heaviest rainfall occurs during April, May, and June. May is commonly the wettest month and November is the driest. The prevailing winds are from the northwest with an average velocity of 10 mph, and are subject to wide variations.

b. Summary and Conclusions

Reclamation depends largely on the amount and time of precipitation. Regrowth may be slow in a dry year, but when there is sufficient precipitation, all reclaimed lands will show excellent regrowth.

5. Topography, Geology and Overburden Assement

a. Description of Overburden

i) Interbedded shale and sandstone contained in the lower Frontier Formation.

b. Natural Slope Conditions

The natural slopes which will be affected by the mining operations vary from 0^{o} - 5 degrees, with most of the land in the 0^{o} - 5 degree range.

c. Geological Stratigraphy and Structure

The permit area lies on a gentle northeast slope resulting from the uplifting of Sheep Mountain.

6. Hydrology

a. Surface Water

i) See Mine map.

ii) During any one year of operation, no more than 2 to 3 acres will affect drainage in the area. Any run-off will be minimal.

iii) Bear Creek is the only live-water stream in the permit area. Most of the year the creek runs about one-half

Permit No. 624(5)

Temporary Filing No. 2 4/134

DEQ 3 - 007

foot of water during the spring and early summer, depending on the year it may flow as much as 10 to 15 feet. But, most of the water is taken out above the mine area to irrigate Bear Creek Ranch. The mining operation will have no effect on Bear Creek.

b. Water Rights

i) All water rights are owned by Richard W. Leavitt. These rights are used to irrigate Bear Creek Ranch ten to fifteen miles to the North. No water from Bear Creek is used in the area south of Bear Creek Ranch, nor are there any water rights or diversion ditches.

ii) No water wells or water well permits exist within three miles of the permit area.

7. Soils Assessment (See report by Bill Eckert attached.)

a. Soils Inventory (Except for the "draws" in the mine area one to two feet of soil can be recovered in the mine area.) See Mine Plan map.

See Reclamation Map.

b. Soil Mapping Units (See report by Bill Eckert attached.)

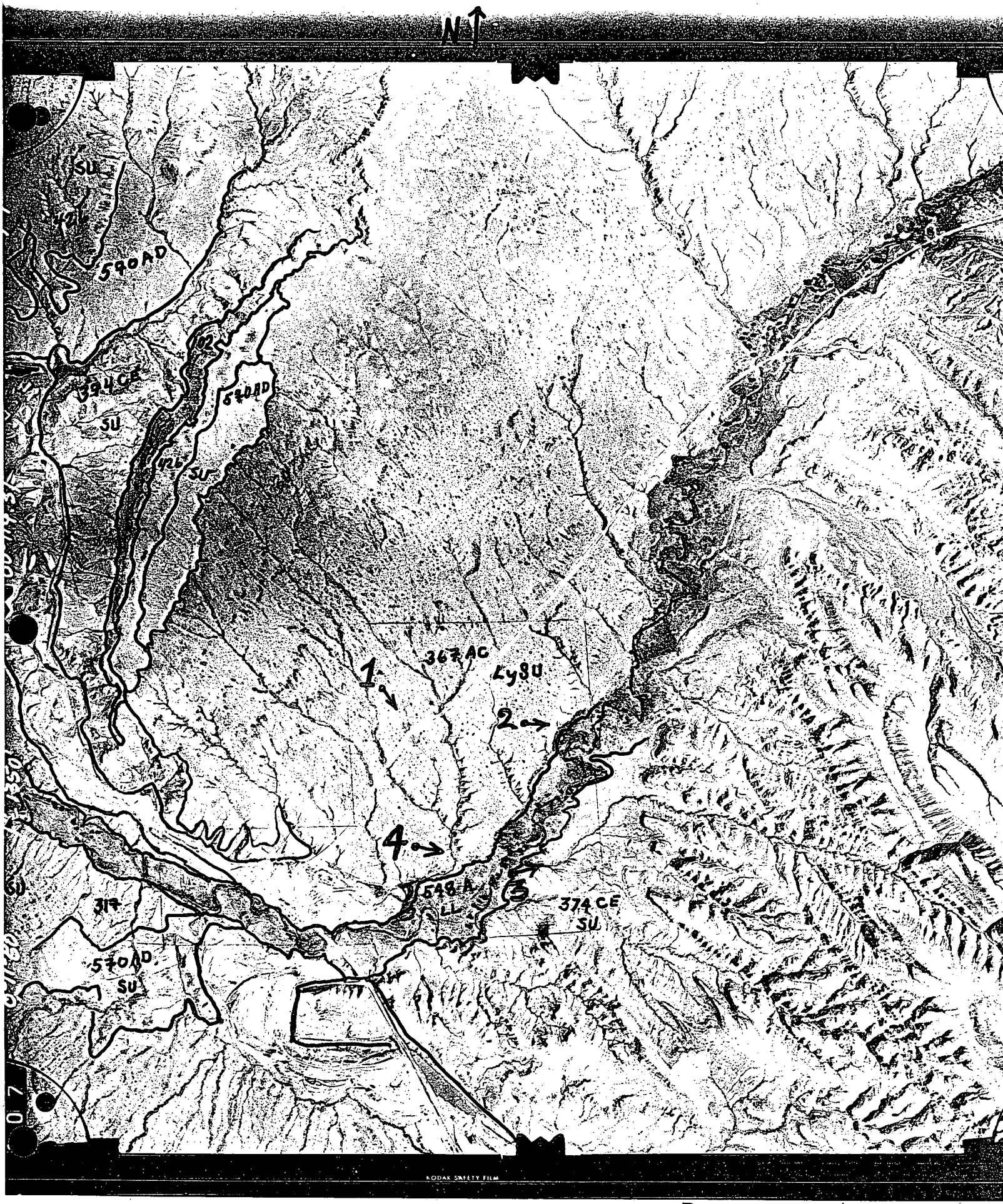
8. Vegetation Inventory (See report by Bill Eckert attached.)

a. Methods

Vegetation inventories were done by the Big Horn County Agent.

b. Results (attached) (See report by Bill Eckert attached.)

See attached vegetation inventories.



Permit No. DEQ 3-009(S)

Temporary Filing No. 2 4/134

RANGE SITE & CONDITION DATA

LOCATION _____ AERIAL PHOTO # 4-9 8-11-80

AREA Bear Creek-South RANGE SITE PHOTO # 4

DATE-SITE EVALUATION 10-25-82 BY John W. Eckerdt

RANGE SITE SV-Saline Upland

SPECIES	PRESENT COMPOSITION Present % Composition	% Allowable in Potential
Gardners Saltbush	76	50
Big Sagebrush	T	0
Bottlebrush Squirreltail	6	25
Sandberg Bluegrass	T	5
Forbs	6	10
Cactus	12	0

RANGE CONDITION CLASS 62 ESTIMATED GROUND COVER % 14

KEY GRAZING PLANTS Bottlebrush, Squirreltail, and Sandberg Bluegrass

KEY BROWSE SPECIES Gardners Saltbush

RANGE CONDITION Good RANGE TREND Down

Range Condition	% Original Vegetation
Excellent	76-100
Good	51- 75
Fair	26- 50
Poor	0- 25

Permit No. 624(5)

Temporary Filing No. 24/134

DEQ 3 - 010

RANGE SITE & CONDITION DATA

LOCATION [redacted]

AERIAL PHOTO # 4-9 8-11-80

AREA Bear Creek-South

RANGE SITE PHOTO # 3

DATE-SITE EVALUATION 10-25-82

BY John W. Eckerdt

RANGE SITE Lowland

PRESENT COMPOSITION

SPECIES	Present % Composition	% Allowable in Potential
Greasewood	82	0--20
Big Sagebrush	7	0
Gardners Saltbush	2	0
Bottlebrush Squirreltail	1	5
Forks	6	10
Buffalo Burr	T	0
Cheatgrass	T	0
Rubber Rabbitbrush	T	0
Cottonwoods	2	20
Rhizomatous Wheatgrass	T	5
Sandberg Bluegrass	T	5

RANGE CONDITION CLASS 29

ESTIMATED GROUND COVER % 35

KEY GRAZING PLANTS Bottlebrush, Squirreltail, and Sandberg Bluegrass

KEY BROWSE SPECIES Gardners Saltbush

RANGE CONDITION Fair

RANGE TREND Down

Range Condition % Original Vegetation	
Excellent	76-100
Good	51- 75
Fair	26- 50
Poor	0- 25

Permit No. 624(5)

Temporary Filing No. 24/134

RANGE SITE & CONDITION DATA

LOCATION [redacted] AERIAL PHOTO # 4-9 8-11-80

AREA Bear Creek-South RANGE SITE PHOTO # 2

DATE-SITE EVALUATION 10-25-82 BY John W. Eckerdt

RANGE SITE LySV-Loamy Saline Upland

SPECIES	PRESENT COMPOSITION Present % Composition	% Allowable in Potential
Gardners Saltbush	72	50
Big Sagebrush	3	0
Bottlebrush Squirreltail	12	25
Sandberg Bluegrass	T	5
Forbs	8	10
Cactus	5	0

RANGE CONDITION CLASS 70 ESTIMATED GROUND COVER % 14-16

KEY GRAZING PLANTS Bottlebrush, Squirreltail, and Sandberg Bluegrass

KEY BROWSE SPECIES Gardners Saltbush

RANGE CONDITION Good RANGE TREND Down

Range Condition	% Original Vegetation
Excellent	76-100
Good	51- 75
Fair	26- 50
Poor	0- 25

Permit No. 624(5).

Temporary Filing No. 24/134

DEQ 3 - 012

RANGE SITE & CONDITION DATA

LOCATION _____ AERIAL PHOTO # 4-9 8-11-80

AREA Bear Creek South RANGE SITE PHOTO # 1

DATE-SITE EVALUATION 10-25-82 BY John W. Eckerdt

RANGE SITE LySV-Loamy Saline Upland

SPECIES	PRESENT COMPOSITION Present % Composition	% Allowable in Potential
Gardners Saltbush	69	50
Big Sagebrush	6	0
Bottlebrush Squirreltail	12	25
Sandberg Bluegrass	T	5
Forbs	8	10
Cactus	5	0

RANGE CONDITION CLASS Good ESTIMATED GROUND COVER % 16-18

KEY GRAZING PLANTS Bottlebrush, Squirreltail, and Sandberg Bluegrass

KEY BROWSE SPECIES Gardners Saltbush

RANGE CONDITION Good RANGE TREND Down

Range Condition % Original Vegetation	
Excellent	76-100
Good	51- 75
Fair	26- 50
Poor	0- 25

Permit No. 624(s)

Temporary Filing No. 24/134

DEQ 3 - 013

SOILS

Rairdent - Uffens Association 367 AC

This association consists of nearly level to sloping, very deep soils on alluvial fans and terraces at elevations between 3800 to 5200 feet. The annual precipitation is about 7 inches. The mean annual soil temperature is about 52° F. with mean summer soil temperature about 69° F. The frost free season is 110 to 140 days. This association is bout 60 percent Rairdent, 0 to 10 percent slopes and about 35 percent Uffens, 0 to 10 percent slopes. The Rairdent soil is located on nearly level to sloping fans and terraces. The Uffens soil is located on nearly level to sloping fans and terraces.

Included with this association in mapping are areas of Gystrum soil. This inclusion makes up about 5 percent of the total acreage.

The Rairdent series is a very deep, well drained soil formed in moderately fine textured alluvial sediments on nearly level to sloping alluvial fans and terraces. Typically, the surface layer is very pale brown loam about 2 inches thick. The underlying material is very pale brown loam about and to white loam and clay loam about 56 inches thick.

The Rairdent soil has moderate permeability. The effective rooting depth is 40 inches or more. Available water capacity is 7 to 11 inches. Surface runoff is slow to medium and the erosion hazard is slight to moderate.

The Uffens series is a very deep, well drained soil formed in moderately fine textured alluvial sediments on nearly level to sloping fans. Typically, the surface layer is light gray loam about 4 inches thick. The subsoil is light gray clay loam about 11 inches thick. The substratum is pale brown sandy clay loam to 54 inches.

The Uffens soil has moderate permeability. The effective rooting depth is 40 inches or more. Available water capacity is 6.2 to 10.8 inches. Surface runoff is slow to rapid and the erosion hazard is slight to severe.

The Rairdent soil has native vegetation that consists mainly of a grass-shrub association.

The Uffens soil has native vegetation that consists mainly of a grass-shrub association.

Permit No. 624(s)

Temporary Filing No. 24/134

These soils are rangeland and are used primarily for grazing and wildlife habitat. Proper grazing management can help offset or minimize the deterioration caused by over utilization.

Management of the vegetation supported by the Uffens soil should be designed to increase the production of Gardner saltbush, Indian ricegrass, and bottlebrush squirreltail. The application of management practices such as proper grazing use, deferred, or deferred rotation grazing can help offset or minimize the limitations of these soils and help them produce more desirable plant species. Such accelerated practices as brush managemnt, cross fencing, and water development can be used to more effectively utilize these soils without damaging them. Bed grounds, seismograph trails, pipelines, and similar disturbed areas can successfully be reseeded as part of a reclamation program.

These soils are grazed by cattle, sheep, and horses. They produce food and cover for mule deer, antelope, sage grouse, chukar partridge, small mammals, and birds.

Rairdent part: Capability Unit VIe2, dryland; loamy, 5 to9 inch precipitation zone, range site.

Uffens Part: Capability Unit VIsI2, dryland; saline upland, 5 to 9 inch precipitation zone, range site. Type location for this association is on photo 4EB-229.

Permit No. ...624(s)..

Temporary Filing No. 24/134

DEQ 3 - 015

SOILS

570 AD Muff, Uffens, Persayo Complex

This complex consists of nearly level to moderately steep, very deep to shallow soils on uplands and alluvial fans at elivations between 3800 and 5200 feet. the annual precipitation is about 7 inches. The mean annual soil temperature is about 52°F., with mean summer soil temperature about 62° F. The frost-free season is 110 to 140 days. This complex is about 35 percent Muff, 0 to 10 percent slopes, about 25 percent Uffens, 0 to 10 slopes, and about 20 percent Persayo, 10 to 30 percent slopes. The Muff soil is located on rolling uplands and alluvial fans. The Uffens soil is located on alluvial fans and terraces. The Persayo soil is located on side slopes and breaks and slickspot areas.

Included with this complex in ampping are areas of 317 sandy clay loam, Chipeta, and Bributte soils, and badlands. These inclusions make up about 20 percent of the total acreage.

In some areas the soils are mantled with 6-20 inches of aeolian material having a sandy loam texture. This mantle is predominantly leached, however, unleached areas have also been encountered.

The Muff series is a moderately deep, well drained soil formed in moderately fine alluvium and residuum on nearly level to sloping alluvial fans and rolling uplands.

Typically, the surface layer is a dark brown fine sandy loam, 3 inches thick. The subsoil is a strong brown clay loam, 21 inches thick. The substratum is a brown sandy clay loam, 13 inches thick, and is underlain by sandy shale at 37 inches.

The Muff soil has moderate permeability. The effective rooting depth is 20 to 40 inches. Available water capacity is moderate high. Surface runoff is slow to rapid and the erosion hazard is slight to severe.

The Uffens series is a very deep, well drained soil formed in moderately fine alluvium and residuum on nearly level to sloping alluvial fans and rolling uplands.

Typically, the surface layer is a light gray loam, 4 inches thick. The subsoil is a light brown clay loam, 11 inches thick. The substratum is a pale brown sandy clay loam, to 60 inches or more.

The Uffens soil has moderate permeability. The effective rooting depth is 40 to 60 inches or more. Available water capacity is high. Surface runoff is slow to rapid and the erosion hazard is slight to severe.

The Persayo series is a shallow, well drained soil formed in moderately fine residuum on sideslopes and rolling uplands.

Typically, the surface layer is light brownish gray clay loam, 2 inches thick. The unerlying material is light brownish gray clay loam, 10 inches thick, and is underlain by pale white unconsolidated shale at 12 inches.

The Persayo soil has moderate permeability. The effective rooting depth is 10 to 20 inches. Available water capacity is very low. Surface runoff is rapid and the erosion hazard is moderate.

The complex has native vegetation that consists mainly of a shrub-grass association.

These soils are rangeland and are primarily used for grazing and wildlife habitat. Proper grazing management can help offset or minimize the deterioration caused by over utilization.

Management of the vegetation supported by the complix should be designed to increase the production of gardner saltbush, indian ricegrass, and bottlebrush squirreltail.

The applicatibn of management practices such as proper grazing use and deferred, or deferred rotation grazing can help offset or minimize the limitations of these soils and help them produce more desirable plant species.

Such accelerated practices as brush management, cross fencing, and water develòpment can be used to more effictively utilize these soils without damaging them. Bed grounds, pipelines, and similar disturbed areas can successfully be reseeded as part of a reclamation program.

These soils are grazed by cattle, sheep, and horses. They produce food and cover for umle deer, antelope, sage grouse, chukar partridge, and small mammals, and birds.

This complex is in capability unit VII s 12 dryland, and saline upland, 5 to 9 inch precipitation zone range site.

Type location for this complex is on Schuster Flats NW Quadrangle centered photo.

SOILS

Chipeta - Persayo - Rock Outcrop complex, 6 to 60 percent slopes

374-CE

This complex consists of sloping to steep, shallow soils and rock outcrop on shale uplands at elevations between 3800 and 5200 feet. The annual precipitation is about 7 inches. The mean annual soil temperature is about 52° F., with mean summer soil temperature about 69° F. The frost-free season is 110 to 140 days. This complex is about 40 percent Chipeta clay loam, 6 to 60 percent slopes, and about 20 percent Persayo clay loam, 6 to 60 percent slopes and about 15 percent rock outcrop. These soils are in inter-mingled patterns on the uplands. The Chipeta soil is located on black shale ridge tops and hill sides. The Persayo soil is located on light colored shale ridge tops and hillsides. Rock outcrop occurs as knobs, bands, and escarpments.

Included with this complex in mapping are areas of Deaver and Sayles soils. These inclusions make up about 25 percent of the total acreage.
The Chipeta series is a shallow, well drained soils formed in fine textured residuum on ridge tops. Typically, the surface layer is grayish brown silty clay, 3 inches thick. The underlying material is grayish brown silty clay, 15 inches thick. The substratum is underlain by shale at 18 inches.

The Chipeta soil has slow permeability. The effective rooting depth is 10 to 20 inches. Available water capacity is 1.8 to 4.6 inches. Surface runoff is medium to rapid and the erosion hazard is moderate to high.

The Persayo series is a shallow, well drained soil formed in moderately fine textured residuum on sideslopes. Typically, the surface layer is light gray clay loam, 1 inch thick. The underlying material is light gray clay loam, 10 inches thick, and is underlain by shale at 10 inches. The Persayo soil has moderately slow permeability. The effective rooting depth is 10 to 20 inches. Available water capacity is 1.6 to 3.6 inches. Surface runoff is medium to rapid and the erosion hazard is moderate to high.

These soils have native vegetation that consists mainly of grass and shrub.

These soils are rangeland and are primarily used for grazing and wildlife habitat. Proper grazing management can help offset or minimize the deter-

ioration caused by over utilization.

Management of the vegetation supported by the Chipeta and Persayo soil should be designed to increase the production of Gardner saltbush, Indian ricegrass, and bottlebrush squirreltail.

The application of management practices such as proper grazing use and deferred, or deferred rotation grazing can help offset or minimize the limitations of these soils and help them produce more desirable plant species.

Such accelerated practices as brush management, cross fencing, and water development can be used to more effectively utilize these soils without damaging them. Bed grounds, pipelines, and similar disturbed areas can successfully be reseeded as part of a reclamation program.

These soils are grazed by cattle and sheep. They produce food and cover for mule deer, antelope, sage grouse, chukar partridge, and small mammals and birds.

This complex is in capability subclass VIIe dryland; saline upland, 5 to9 inch precipitation zone range site. Type location for this complex is on photo BBN 5N-50.

FLUVENTS, 0-3 PERCENT SLOPES 548-A

This unit consists of moderately coarse to coarse textured soils underlain by gravel at 5 to 40 inches and gravel bars. They are intermingled on nearly level bottomlands. They are flooded periodically and a fluctuating saline water table is on or near the surface to 30 inches.

The soils are gray sands to sandy loams with reddish brown mottles in the lower part of some profiles. The soils have slight to moderate salinity and moderately rapid to rapid permeability. Included in mapping are small areas of Baroid, Glending, Havig, Poganeab, Willwood, Shoshone and Avent series.

Runoff is slow and erosion hazard is slight to moderate.

This unit is used for pasture, community uses and wildlife habitat.

Highly variable, but primarily soils with a Lowland Range Site. Capability Unit: VIs4, dryland; lowland rangesite.

Technical Guide
Section II E
Major Land Resource Area (32)

SALINE UPLAND (SU)
5-9" Big Horn and Wind River Basins
Correlated Range Site No._____

RANGE SITE DESCRIPTION

A. PHYSICAL CHARACTERISTICS

1. Physiographic Features

This site occurs on all slopes in an upland position. Elevations range from 3,700 feet to 6,000 feet.

2. Climatic Features

See attached climate description.

3. Native (climax) Vegetation

a. The climax plant community is dominated by halophytes, salt-loving plants, and drought-resistant grasses. Potential vegetation is about 40% grasses and grass-like plants, 10% forbs and 50% gardner's saltbush and other woody plants.

b. Plant species and percentage composition of this plant community by air-dry weight:

SPECIES	PERCENT
Grasses and Grass-like Plants	
Indian ricegrass	15-25
Bottlebrush squirreltail	10-25
Western wheatgrass	5-10
Sandberg bluegrass	T-5
Forbs	
All following Forbs	T-10*
Woody aster	
Salsify	
Onion	
Milkvetch	
Winterfat	T-5
Woody Plants	
Gardner's saltbush	30-50
Bud sagebrush	T-10
All following Woody Plants	T-5*

Permit No. 624(5)

Temporary Filing No. DEQ-2-0734

Birdsfoot sagebrush
Greasewood

*Of plants in these groups, no more than 5% of any species is allowable in the potential plant community.

c. Approximate percent ground cover -- 10-20 percent.

d. As the ecological condition changes by deterioration, birdsfoot sagebrush and annuals become more dominant. Species most likely to invade the site as cover deteriorates are stickseed, mustard, cheatgrass, prickly pear, plantago and Russian thistle.

4. Total Annual Production (Pounds per Acre Air-dry Weight)

Favorable years - 550 pounds
Median years - 350 pounds
Unfavorable years - 200 pounds

5. Soils

a. The soils associated with this site are various depths, but generally 8 inches or more in depth. Top soil textures and subsoil permeability are variable. The first 8 to 20 inches has zones where the salt content exceeds .2 percent and/or 15 percent exchangeable sodium. The pH is usually greater than 8.5 in the surface soils. Halophytes are always a major part of the plant community in climax condition. These soils appear extremely droughty due to high salt content.

b. Soils taxonomic units which characterize this site are:

Muff, Greybull, Persayo, Uffens, Stutzman, Chipeta, Deaver, Sayles, Cestnik, Torchlight, Bributte

c. Complete soil descriptions are available in the soil survey descriptive legend.

B. MAJOR USES AND INTERPRETATIONS FOR:

1. Grazing

This site provides good forage for summer, fall, and winter for cattle, sheep and horses.

2. Wood Products

No trees occur on this site.

3. Wildlife

See attached wildlife interpretations sheet.

4. Watershed (Hydrologic Interpretations)

This range site has a potential for moderate to high runoff. The soil cover complex numbers are:

Excellent	80
Good - high fair	85
Fair	90

(See Section 4, SCS National Engineering Handbook for runoff quantities and hydrologic curves.)

5. Recreation and Natural Beauty

Recreation potential for this site is low. Primary recreation use is hunting.

6. Threatened or Endangered Plant and Animals

Threatened or endangered animal species found on this site are the prairie falcon and peregrine falcon (winter months). Threatened or endangered plant species found on this site are payson penstemon (Fremont Co.).

7. Location of Typical Example of the Site (To be determined at the local field office level.)

8. Other Pertinent Information

GUIDE TO SUGGESTED INITIAL STOCKING RATE

Condition Class	Percent Climax Vegetation	AUM's/Acre	Acres/AUM
Excellent	76 - 100	.20	5.00
Good	51 - 75	.15	6.70

Fair	26 - 50	.10	10.00
Poor	0 - 25	.05	20.00

RELATIVE FORAGE QUALITY OF PLANTS FOR ANIMAL USE

1 - Preferred
2 - Desirable
3 - Undesirable
* - Poisonous

PLANT SPECIES	CATTLE	SHEEP	HORSES	DEER	ANTELOPE
Indian ricegrass	1	1	1	1	1
Bottlebrush squirreltail	2	2	2	3	2
Western wheatgrass	2	2	2	2	2
Sandberg bluegrass	2	2	2	2	2
Woody aster	*	*	*	*	*
Salsify	3	3	3	3	3
Onion	2	2	2	2	2
Milkvetch	2	2	2	2	2
Winterfat	1	1	1	1	1
Gardner's saltbush	1	1	2	1	1
Bud sagebrush	1	1	2	1	1
Birdsfoot sagebrush	3	3	3	3	3
Greasewood	2	2	3	2	2

9. Field Offices

Cody	Lander	Riverton
Dubois	Lovell	Worland
Greybull	Powell	Thermopolis

Technical Guide
Section II E
Major Land Resource Area (32)

LOWLAND (LL)
5-9" Big Horn and Wild River Basins
Correlated Range Site No. _____

RANGE SITE DESCRIPTION

A. PHYSICAL CHARACTERISITCS

1. Physiographic Features

This site occurs on lowland positions adjacent to streams that run at least during the major part of the growing season. Elevations range from 3,700 feet to 6,000 feet in the Wind River Basin.

2. Climatic Features

(See attached climate description.)

3. Native (climax) Vegetation

a. The climax plant community is dominated by tall grasses. Potential vegetation is about 60% grasses and grass-like plants, 10% forbs and 30% woody plants.

b. Major plant species and percentage of the total plant community by air-dry weight:

SPECIES	PERCENT
Grasses and Grass-like Plants	
Basin wildrye	10-25
Canada wildrye	5-10
Needleandthread grass	10-25
Slender wheatgrass	5-15
All following Grasses and Grass-like Plants	T-10*
Prairie sandreed	
Indian ricegrass	
Bottlebrush squirreltail	
Western wheatgrass	
Sandberg bluegrass	
Blue grama	
Forbs	
All following Forbs	T-10*
Aster	
Dock	
Phlox	

Woody Plants

Cottonwood	10-20
All Following Woody Plants	T-10*
Rubber rabbitbrush	
Silver buffaloberry	
Wild rose	
Skunkbush sumac	

*Of plants in these groups, no more than 5% of any species is allowable in the potential plant community.

c. Cottonwood occur on this site and overstory canopy is about 15 percent. The site index would be low.

d. Approximate percent ground cover is 30-40 percent.

e. As the ecological condition changes by deterioration, woody species such as cottonwood, silver buffaloberry, and wild roses become more dominant. Species most likely to invade the site as cover deteriorates are ragweed,kochia, dock, Russian thistle and cheathrass.

4. Total Annual Production (Pounds per Acre Air-dry Weight)

Favorable years	- 2,400 pounds
Median years	- 1,800 pounds
Unfavorable years	- 1,400 pounds

5. Soils

a. The soils associated with this site will vary in surface texture depth over gravel or bedrock. The presence of a slightly saline to nonsaline and/or slight alkali to non alkaline water table within reach of the woody plants, but not benefical to the majority of heraceous plants, is the most important environmental factor for this site. This water table is usually more than 3 feet. This site may occasionally be overflowed during flooding conditions.

Grasses and forbs are benefited only slightly; however, the deeper rooted woody plants root deep enough to be greatly benefited by the deep water table.

b. Soil taxonomic units which characterize this site are:

Baroid Fluvents Glending

c. Complete soil series descriptions are available in the soil survey descriptive legend.

B. MAJOR USES AND INTERPRETATIONS FOR:

1. Grazing

This site provides excellent summer grazing and good fall and winter grazing for cattle, sheep and horses. Grazing may be restricted at times because of wetness.

2. Wood Products

Cottonwoods on this site are plentiful enough for some to be harvested for firewood.

3. Wildlife

(See attached general wildlife description for this precipitation zone.)

4. Watershed (Hydrologic Interpretations)

This range site has a potential for low to moderate runoff. The soil cover complex numbers are:

Excellent	55
Good - high fair	65
Fair	80

(See Section 4, SCS National Engineering Handbook for runoff quantities and hydrologic curves.)

5. Recreational and Natural Beauty

Potential value of this site for recreation uses is fair. This site has potential for recreation uses such as picnicking, hunting and camping.

6. Threatened or Endangered Plants and Animals

Threatened or endangered animal species on this range site are the prairie falcon and peregrine falcon (sinter months). Threatened or endangered plant species on this site are payson penstemon (Fremont Co.).

7. Location of Typical Example of the Site (To be determined at the local field office.)

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8. Other Pertinent Information

GUIDE TO SUGGESTED INITIAL STOCKING RATE

Condition Class	Percent Climax Vegetation	AUM's/Acre	Acres/AUM
Excellent	76 - 100	.4	2.5
Good	51 - 75	.33	3.0
Fair	26 - 50	.20	5.0
Poor	0 - 25	.10	10.0

RELATIVE FORAGE QUALITY OF PLANTS FOR ANIMAL USE

1 - Preferred
2 - Desirable
3 - Undesirable
* - Poisonous

PLANT SPECIES	CATTLE	SHEEP	HORSES	DEER	ANTELOPE
Basin wildrye	1	1	1	2	2
Canada wildrye	1	1	1	2	2
Needleandthread grass	1	1	1	1	1
Slender wheatgrass	1	2	1	2	2
Prairie sandreed	1	2	1	3	3
Indian ricegrass	1	1	1	1	1
Bottlebrush squirreltail	2	2	2	3	2
Western wheatgrass	2	2	2	2	2
Sandberg bluegrass	2	2	2	2	2
Blue grama	2	2	2	2	2
Aster	3	3	3	3	3
Dock	3	3	3	3	3
Phlox	3	3	3	3	3
Rubber rabbitbrush	3	1	3	2	1
Silver buffaloberry	3	3	3	3	3
Wild rose	2	2	3	2	2
Skunkbush sumac	2	2	3	2	2
Cottonwood	1	1	1	1	3

9. Field Offices

Cody	Lander	Riverton
Dubois	Lovell	Worland
Greybull	Powell	Thermopolis

9. Wildlife

a. The following wildlife is known to exist or thought to exist in habitats located around the permit area. The information was obtained from the Wyoming Game and Fish Department.

Birds

Sage Grouse
Chuckers
Sage Sparrow
Duke
Rough legged Hawk
Song birds - several species

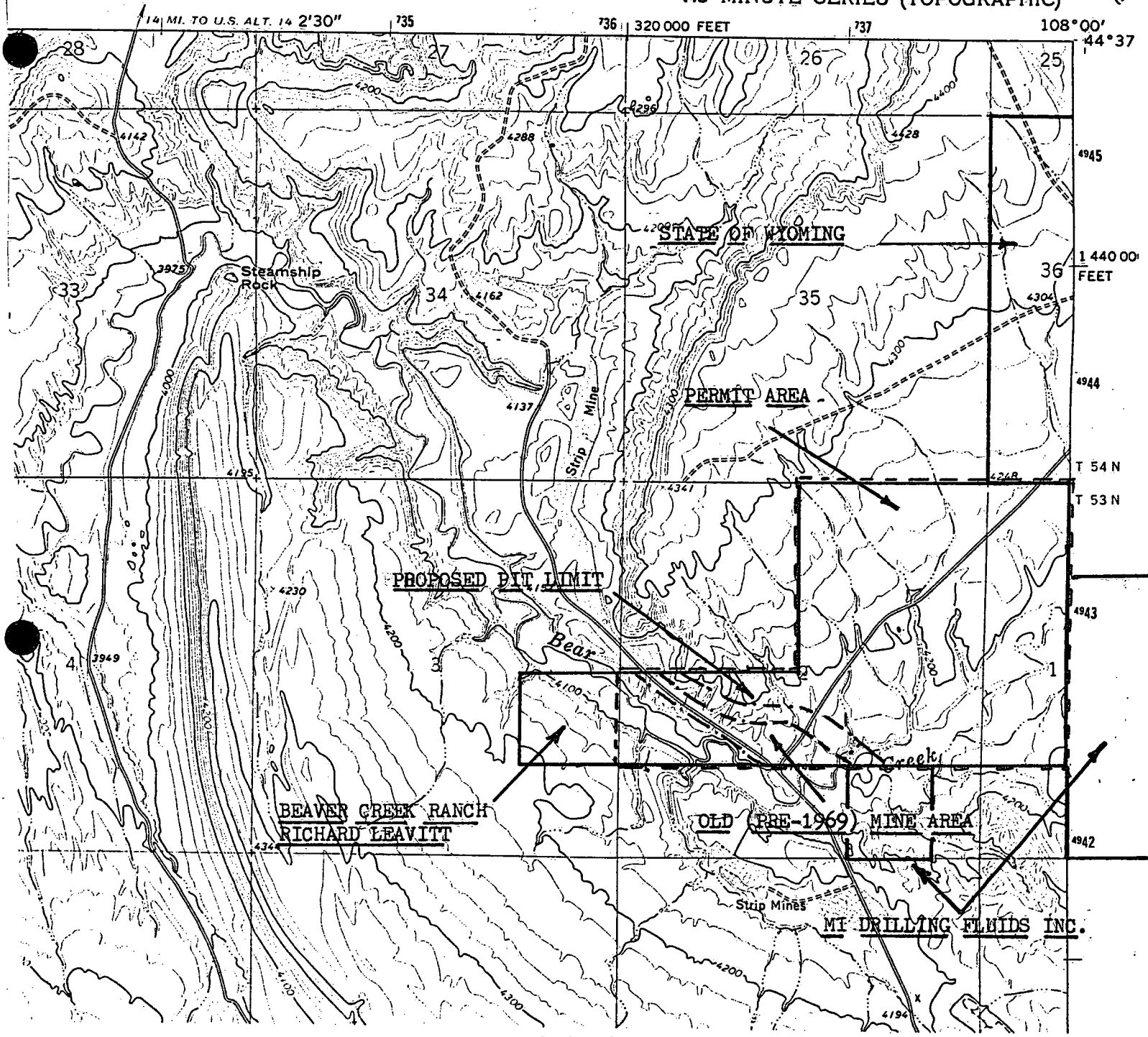
Wild life Ranges

Deer - year long

Fur Animals

White-tailed Jackrabbit (Lepus townsedii)
Coyote (Canis latrans)
Red Fox (Vulpes vulpes)
Badger (Taxidea taxus)
Spotted skunk (Spilogale putorius)
Striped skunk (Mephitis mephitis)
Bobcat (Lynx rufus)
Raccoon (Procyonloter)

NOTE: Over the past twenty years the areas adjacent to the permit area have been permitted and mined by Dresser Industries (MI Drilling Fluids, Inc.). The State of Wyoming should have ample data for evaluating any effect this permit might have on Wildlife.



APPENDIX "E"
SURFACE OWNERSHIP MAP

LEGEND:
- — — — PERMIT BOUNDRY
- PRIVATE AND STATE LAND BOUNDRY
- ALL ADJACENT LAND IS OWNED BY BLM

N

TANNER
MINE PERMIT MAP
BEAR CREEK SOUTH
BIG HORN CO. WYO.
T53N, R93W
JAN. 1989 SCALE: 1" = 2000'

Permit No. 624(5)
DEQ 3-030
Temporary Filing No. 24/134

MINE PLAN

AND

RECLAMATION PLAN

Permit No. 624(5)

Temporary Filing No. 24/34

DEQ 3 - 031

MINE PLAN

1. General Description of Mining Operation.

a. Type of Mine

The mine will consist of one small open cut per year. The cut will cover approximately two acres and will never exceed four acres.

b. Life of Mine

Each cut will be reclaimed after being mined out. Mining will be active within the permit area for at least the next ten years. The area will be reclaimed after the adjacent pit is stripped and mined.

c. Equipment List

1 D-7 or D-8 Cat, 1 JD 860 scraper, and 1, 3 yard front-end loader.

2. = Description and Mapped locations of Mine Facilities and Other Construction (See enclosed Mine maps showing pit plan, haul and access roads.).

a. No building, processing plants or other facilities are planned.

b. Existing roads that are now used to gain access to the permit area will be used as access and haul roads to the mine area. No new roads will be constructed in the permit area.

3. Mining Method and Schedule

a. Topsoil

i) Topsoil from the initial pits #1 through #4 will be piled north and adjacent to the final pit limits (200' to 300' from the initial pits.).

The affected land in the permit will not exceed 35 acres.

The pit depths will not exceed 65'. If enough topsoil exists (based on recommendations from the Department of Environmental Quality), adjacent pre-1969 mine areas will be topsoiled and reseeded.

ii) Quantity - At least one stockpile will be made north and adjacent to each pit. The stockpile locations and approximate size are shown on the reclamation map. The height of the stockpile will not exceed ten feet. There is an estimated 40,000 yards of topsoil in the mine area; all of the topsoil will be saved and replaced during the reclamation process.

iii) Stockpile Conservation - Any stockpile of soil which is to be stored for more than one year and natural revegetation does not take place, a suitable temporary cover will be planted and the stockpile will be marked as being topsoil.

b. Mine Pit Excavation, Backfilling and Contouring

i) Methods - This is a pre-1969 mine area. All lands adjacent to the proposed pits have been mined and depleted. (See Mine Plan Map.) The topsoil from the proposed pits will be recovered to a depth of 1 to 1.5 feet and stored north and adjacent to the last pit. The overburden from the pits will be pushed into the mined out areas.

If drying is conducted the mined out area will be used to "field dry" the bentonite. Topsoil from each subsequent pit will be recovered and stored for final reclamation. Plans are to mine at least 200' from the present edge of the existing pit. Any mining beyond these two cuts will depend on future economics and demand for bentonite.

All pits as well as the last pit will be shaped and graded to a surface configuration consistent with post-mining uses and adjacent topography. All mined out pits will then be topsoiled and reseeded. All slopes will be no greater than 3:1. The affected land in the permit will not exceed 35 acres. See affected area outlined on the mine plan map.

ii) None

iii) Burial of Toxic Materials - No acid-forming or other toxic materials are encountered or created in the mining process. All stray bentonite and bentonite cleanings will be deposited with other overburden and then with suitable topsoil material to the extent available.

iv) In the process of pushing overburden into the proceeding cut, the weight of the equipment will provide adequate compaction. No toxic substances are anticipated.

v) Mine Sequence Map - See Mine Plan Map.

c. Commodity Removal and Handling

i) Removal process - Plans are to use a field drying program that involves leaving the bentonite in the field for approximately one year after exposure. This field drying reduces the moisture content of the clay from approximately thirty percent to eighteen percent,

saving fuel in both the hauling and processing of the bentonite. With this in mind the bentonite is removed in six to eight inch layers and placed adjacent to the pit high-wall. Topsoil will be removed before piling the bentonite. A scraper wide buffer zone will be left adjacent to the bentonite. The dried bentonite will then be hauled to the plant before the next pit is opened up.

d. Mining Hydrology

No water is used in the mining process. All pits will be designed to let natural drainage continue for the life of each pit. No impoundments will be created unless the surface owner documents a need for one. At no time will overburden be pushed over the edge of the pit, or into the adjacent Bear Creek drainage area. During the mining process a barrier will be kept in place adjacent to Bear Creek to prevent surface runoff.

RECLAMATION PLAN

1. Post Mining Land Use

All lands will be returned to their present use of limited grazing and wildlife habitat.

2. Re-contouring Plan

All overburden and pit banks will be graded to a topography similar to existing topography prior to mining and will conform with adjacent undisturbed areas. All slopes will be left in a stable condition (no greater than 3:1) and will be tranversible by livestock. Natural drainages will be returned to their approximate original contours and all potential boggy conditions will be eliminated. Shaping will be done as the overburden is deposited during the backfill. After reshapping the topsoil will be placed back on the overburden, shaped, tilled, and reseeded.

3. No water impoundments planned

4. Surface Preparation

All surface preparation will be done during the mining/backfill operation.

5. Topsoil/Subsoil Replacement

a. Methods of Replacement

Topsoil and subsoil will be replaced on previously mined out pits as it is removed from a currently operating pit. The soil will be brought into the old pit by scrapers and contoured with bulldozers. The topsoil will then be tilled and replanted.

b. Schedule for Replacement

Soil replacement will take place concurrent with the mining operations as described in the mine plan. The initial stockpiled topsoil and subsoil will be used on the last pit. All pits will be reclaimed after the area is no longer needed for field drying.

c. Replacement Depth

All affected areas will be covered by suitable topsoil material to the extent available. All bentonite cleanings will be covered by at least two feet of subsoil. At least one foot to 1.5 feet of topsoil will be replaced in the mined out areas.

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DEQ 3 - 035

d. Erosion Control

Natural drainage will be maintained throughout the mining operation. Any stockpile of soil material will be seeded if left for longer than one year. Re-graded areas will be graded so as to prevent loss by water erosion. Steep slopes will usually not be affected by mining; in cases where steep slopes are disturbed, a suitable seeding program will be used.

e. Soil Amendments

No fertilizers or other soil treatments are planned at this time. However, if any such treatments are deemed necessary, the recommendations of the appropriate State or Federal agencies will be sought.

6. Re-Vegetation Practices

Live-topsoiling will be employed on all regraded cuts. On any affected steep slopes, a suitable seed mixture will be used to re-vegetate the area. All affected areas will be re-vegetated based on soil tests and recommendations of the DEQ. The seed will be broadcast or drilled and harrowed or dragged on the contour. All seeding will be done between October 15 and May 15 with late fall the preferred planting time. A seed bed will be prepared with tillage machinery. Seed to be used in the re-seeding will be based on DEQ recommendations.

7. Protection of Re-Seeded Areas

The newly seeded areas will be protected from grazing pressure for at least two years whrough a co-operative agreement of grazing deferment with the surface owners. If this cannot be worked out, the re-seeded area will be fenced.

8. Other Reclamation in the Permit Area

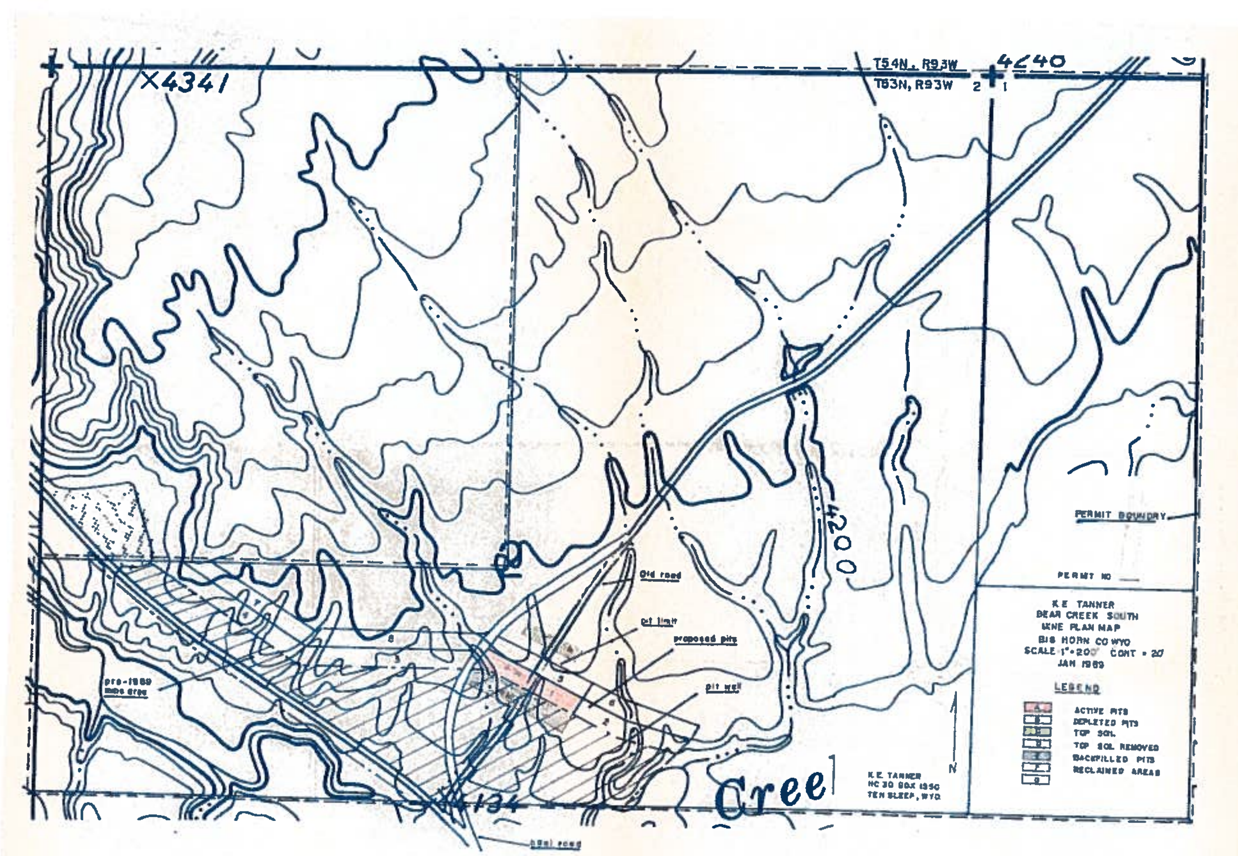
a. Building and Structures

No building or other structures will be constructed within the permit area.

b. Roads - No new roads will be needed in the operation.

9. Reclamation Costs

Since all reclamation will be conducted during the mining operations and is in essence a part of the mining process, an exact cost is difficult to determine. An estimated total reclamation cost is $4,000.00/acre. The first year of operation will affect only 1 to 2 acres. During the life of the operation no more than three acres will be affected during any one year and the total mine area to be affected for the life of the mine will not exceed 35 acres. Total reclamation costs for the mine, during any one year, should not exceed $10,000. I have tried to estimate the costs on a contract basis, by an outside contractor.


X4341
T54N, R93W
T53N, R93W
4240
4200
PERMIT BOUNDRY
PERMIT NO
K.E. TANNER
BEAR CREEK SOUTH
MINE PLAN MAP
BIG HORN CO WYO
SCALE 1"=200' CONT = 20'
JAN 1989
LEGEND
ACTIVE PITS
DEPLETED PITS
TOP SOIL
TOP SOIL REMOVED
BACKFILLED PITS
RECLAIMED AREAS
K.E. TANNER
HC 30 BOX 1350
TEN SLEEP, WYO.
N
old road
pit limit
proposed pits
pit wall
pre-1989
mine area
Cree
haul road