

### Document Information Form

Mine Number: C/015/019

File Name: Incoming

To: DOGM

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Person N/A

Company N/A

Date Sent: N/A

Explanation:

REVEGETATION / ENVIRONMENT CONDITIONS.

cc:

File in:  
CI 015, 019, Incoming

- Refer to:
- Confidential
  - Shelf
  - Expandable

Date \_\_\_\_\_ For additional information

Revegetation

Environment Conditions

The surrounding vegetation is a pinyon-juniper community. Important perennial understory species include curlleaf mountain mahogany, Cutler ephedra, black sagebrush, Harriman yucca, Indian ricegrass and bottlebrush squirreltail. Grasses are rare within this pinyon-juniper community.

The soil is a loamy-skeletal, mixed, mesic Xeralic Calciothid and belongs to the Kenilworth series. These soils have a pH of around 7.7 and an exchangeable sodium of 4 percent. Erosion potential is moderate.

The range site is a Semi-Desert Stony Loam (Pinyon-Juniper). Slopes vary from 3 to 5 percent. Annual precipitation is 8 to 10 inches with the majority being received during late summer. The frost-free season is 110 to 130 days. Elevation varies around 6800 ft. Present use of the area is rangeland. The post-mining use will also be rangeland.

A native plant mixture has been selected that is adapted to the site (Table 1). These species are perennial, drought resistant and fairly salinity resistant.

A fall planting will occur after September 1 when soil water and weather conditions are favorable. A grass and forb mixture will be direct seeded at a rate of 12 pounds of pure live seed per acre (Table 2). Container-grown shrubs will be transplanted immediately after seeding occurs at a density of 1700 seedlings per acre (Table 3).

Forbs and grasses will be direct seeded using a rangeland drill. Two passes over the area will be necessary to accomplish the seeding.

On the first pass, the seed will be planted at a depth of one to two inches. On the second pass, the seed will be planted as a mixture of one to two inches and one-half inch.

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## Revegetation

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Forbs and grasses will be direct seeded using a rangeland drill. Two passes over the area will be necessary to accomplish the seeding. On the first pass, only Indian ricegrass will be planted at a depth of one to two inches. The other grass and forb seed will be planted as a mixture on the second pass at a depth of about one-half inch.

Immediately after seeding straw will be used to mulch the area at a rate of two tons per acre. The straw will then be crimped into the soil.

The container-grown shrub seedlings will be transplanted after mulching. Standard transplanting procedures will be followed. Care will be taken to minimize root damage to the seedlings. If possible, seedlings will be irrigated immediately after transplanting. At the time of transplanting a slow release fertilizer such as Agriform Planting Tablets will be placed with each seedling.

Proper management is important following the revegetation process. Livestock and wildlife grazing will be prevented for at least two years. Also, all vehicle and foot traffic will be restricted from the area. Fencing the revegetated area will prevent livestock grazing and keep unwanted traffic away. If rodent, rabbit and deer damage is anticipated, Vexar plastic netting can be placed around individual shrub seedlings to minimize animal depredation.

Sources of seeds, container-grown shrubs:

Kroh Nurseries, Inc.  
P.O. Box 536  
Loveland, CO 80537  
(303) 667-5466

Mountain West Environments, Inc.  
P.O. Box 2107  
Steamboat Springs, CO 80477  
(303) 879-2313

Native Plants, Inc.  
360 Wakara Way  
Salt Lake City, UT 84108  
(801) 582-0144

Wm. Roger Stewart & Sons  
Box 724  
Ephraim, UT 84627  
(801) 283-4423

Source for the Vexar plastic netting and Agriform Planting Tablets:

International Reforestation Supplier  
P.O. Box 5547  
Eugene, OR 97405  
(503) 345-0597

Table 1. Recommended native plant species for revegetating the Waste Rock Storage Site.

	<u>Scientific Name</u>	<u>Common Name</u>
<u>Grasses</u>	<u>Agropyron riparium</u>	Streambank wheatgrass
	<u>A. smithii</u>	Western wheatgrass
	<u>Elymus cinereus</u>	Great Basin wildrye
	<u>Oryzopsis hymenoides</u>	Indian ricegrass
	<u>Stipa comata</u>	Needle-and-Thread grass
<u>Forbs</u>	<u>Aster chilensis</u>	Pacific aster
	<u>Hedysarum boreala</u> <sup>a</sup>	Northern sweetvetch
	<u>Penstemon palmeri</u>	Palmer penstemon
	<u>Sphaeralcea coccinea</u>	Scarlet globemallow
<u>Shrubs</u>	<u>Artemisia nova</u>	Black sagebrush
	<u>Atriplex canescens</u>	Fourwing saltbush
	<u>Cercocarpus ledifolius</u>	Curlleaf mountain mahogany
	<u>Ephedra cutleri</u>	Cutler ephedra

<sup>a</sup> native legume

Table 2. Planting rate (pounds of pure live seed per acre) of grass and forb seeds.

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	<u>Species</u>	<u>Planting Rate</u>
<u>Grasses</u>	Western wheatgrass	2.0
	Indian ricegrass	2.0
	Needle-and-thread grass	2.0
	Galleta	2.0
	Crested wheatgrass	<u>1.0</u>
		9.0
<u>Forbs</u>	Scarlet globemallow	1.0
	Yellow sweet clover	<u>1.0</u>
		2.0

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Table 3. Planting rate of shrubs (pounds of pure live seed per acre).

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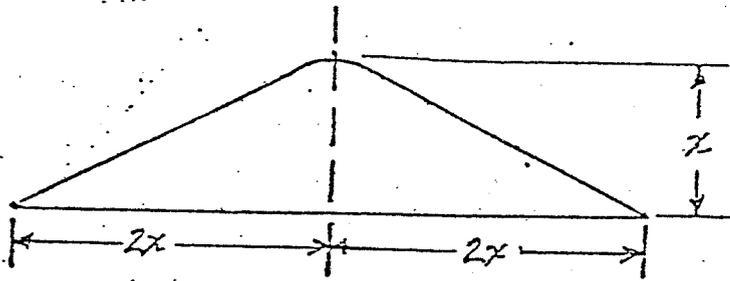
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<u>Species</u>	<u>Planting Rate</u>
Fourwing Saltbush	2.0
Curlleaf Mountain Mahogany	2.0
Ephedra Mormon Tea	4.0
Vasey Big Sagebrush	<u>0.2</u>
	8.2

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Waste Dump Berm Design

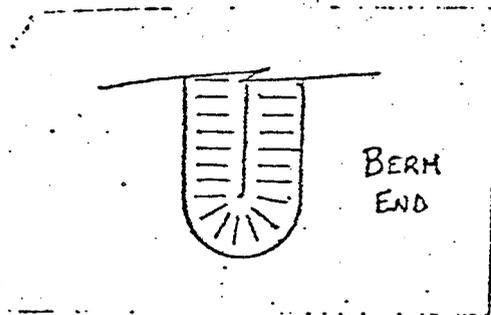


Excavate 200' x 300' x 1'

Volume Material = 60,000 Ft.<sup>3</sup>

Assume: Negligible Swell

Berm Length = 160' + 375' + 375' + Ends + Corners



Volume Ends = 7 cone

$$= \frac{1}{3} \pi r^2 h ; h = x \quad v = 2x$$

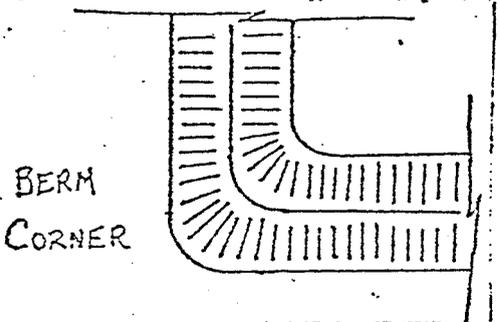
$$= \frac{4}{3} \pi x^3$$

Equivalent Length

$$2x^2 L = \frac{4}{3} \pi x^3$$

$$L = \frac{2}{3} \pi x ; \text{ Assume } x = 6$$

$$L = 12.6'$$



$$\text{Equ. Length Corners} = 2x + 2x + 2x + 2x$$

$$= 8x$$

$$= 42'$$

Total Berm Length = 970.6 use 970'

Volume of 2h : lv berm per foot of length =  $2x^2$

Waste Dump Volume Calculation

Anticipated Rock Tonnage = 11,000 Tons

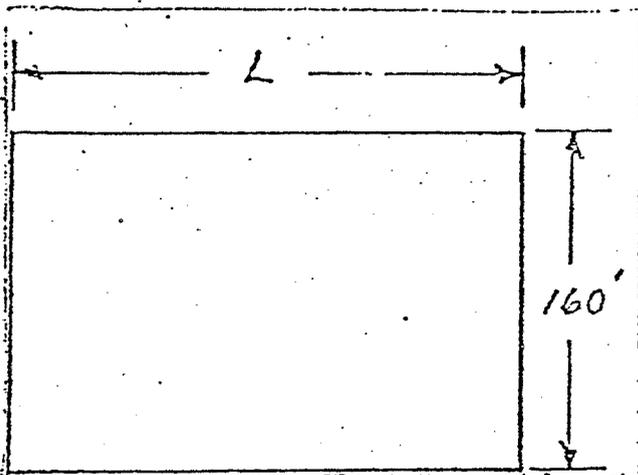
Assumed Loose Density = 2,500 lbs./cu. yd.

= 1.25 tons/yd.<sup>3</sup>

Volume Required =  $\frac{11,000 \text{ Tons}}{1.25 \text{ Tons/yd.}^3}$

= 8,800 yd.<sup>3</sup>

= 237,600 Ft.<sup>3</sup>



- Length for 160' Wide Dump

- Placement in single 4' lift

$$L = \frac{237,600 \text{ ft.}^3}{4 \text{ ft.}} \div 160 \text{ ft.}$$

$$= \underline{371'} \quad \text{use} \quad \underline{375'}$$

Therefore, Proposed Storage Area = 160' x 375'

Waste Dump Berm Design (Continued)

Find Berm Height (x):

$$\begin{aligned}\text{Volume Req. Per Foot of Berm} &= \frac{60,000 \text{ Ft.}^3}{970 \text{ Ft.}} \\ &= 62 \text{ Ft.}^3\end{aligned}$$

Therefore:  $2x^2 = 62 \text{ Ft.}^2$

$$x^2 = \frac{62 \text{ Ft.}^2}{2}$$

2

$$= 31 \text{ Ft.}^2$$

$$x = \underline{\underline{5.6'}}$$

(Assumption of  $x = 6'$  close enough)

Use 5.5' Berm Height

22' Base Width

WILBERG WASTE ROCK DUMP SITE

SOIL DESCRIPTION

JOSEPH M. JARVIS

WILBERG WASTE ROCK DUMP SITE

SITE: Portions of E $\frac{1}{2}$ SE $\frac{1}{4}$  S. 34 and W $\frac{1}{2}$ SW $\frac{1}{4}$  S. 35 T. 17 S. R. 17 E. SLBM. 48.62 acres

PARENT MATERIAL: Alluvial outwash of Cretaceous sandstone and siltstone beds.

ASPECT: Southeast

SLOPE: 3%

ANNUAL PRECIPITATION: 12 inches

VEGETATION: Pinyon-Juniper Woodland

An open stunted type with a sparse shrub understory of Ephedra nevadensis, Cercocarpus montanus and Cowania mexicana.

LAND USE: Currently the site has a coal hauling road and is partially cleared of trees on about ten acres. Some deer winter use occurs here but the alluvial fan produces less browse than adjacent higher slopes.

PRODUCTIVITY: Low, 1,000 lbs/acre

SOIL: A young shallow alluvial derived soil, calcerous with a definite hardpan. Impervious layer influences plant growth so large rooted species predominate in the vegetation composition.

SOIL DESCRIPTION:

- A<sub>1</sub> 0-3" Brown (10YR 5/3,moist) silt loam; gravelly with scattered rocks; granular, soft, loose, slightly sticky, slightly plastic; moderately calcerous, PH 8.2; few small and medium roots; boundary gradual.
- A<sub>2</sub> 3-18" Pale brown (10YR 6/3,moist) loam, gravelly with scattered rocks; small angular blocky, friable, slightly sticky, slightly plastic; moderately calcerous; common small and medium roots, some large relic roots; some clay buildup at 14", cobble bed at 18-20"
- C<sub>ca</sub> 20"- Light brownish gray (10YR 6/2,moist) caliche,rocky; massive, very hard, strongly calcerous; few medium roots; a cemented caliche layer.
- C Depth varies but consists mainly of bedded cobbles and rocks.