Mountain Coal Company
West Elk Mine
Post Office Box 591
Somerset, Colorado 81434
Telephone 303 929-5015

RECEIVED
AUG 11 1997
DIV. OF OIL, GAS & MINING

August 1, 1997

Pamela Grubaugh Littig
Permit Supervisor
Utah Division of Oil, Gas & Mining
P. O. Box 145801
Salt Lake City, Utah 84114-5801

Re: Phase III Bond Release
Gordon Creek No. 3/6 Mines
INA / 007 / 017; Folder #2
Carbon County, Utah

Dear Ms. Littig:

In reference to your letter of 10/24/96, Mountain Coal Company is providing 3 copies of additional information requested for the Gordon Creek No. 3/6 Mine Bond Release.

Each of the requested items are addressed in separate, attached sections to be added to the previously submitted Bond Release application.

It is our hope this information will satisfy the noted deficiencies. If you have any questions, or need additional information, please let me know.

Sincerely,

Dan W. Guy
for
Paige B. Beville

cc: Paige Beville
File

MOUNTAIN COAL COMPANY

GORDON CREEK NO. 3/6 MINES

PHASE III BOND RELEASE

Mining / Reclamation History

Mining / Reclamation History

Mining

The Gordon Creek Nos. 3 and 6 Mine portals are located in Coal Canyon, approximately thirteen (13) miles northwest of Price, Utah in Section 16, Township 13 South, Range 8 East. The mines shared common surface facilities, except conveyors and stockpiles. The disturbance for both mines is pre-existing, even though production in the No. 6 Mine did not actually start until November, 1978. The No. 3 Mine was opened in October, 1975. Both mines were permanently closed in September 1983.

The general area of mining was in the northeast part of the Wasatch Plateau in the Black Hawk formation of the Mesa Verde group. The No. 3 Mine is in the Hiawatha Seam (lower), and the No. 6 Mine is located some 150 feet above in the Castle Gate "A" seam.

Both mines were underground with small surface disturbed support areas. There area no Federal coal leases involved. All coal and surface is privately owned, except for a coal lease from Carbon County of 320 acres, and a 40-acre State Lease #27542.

There were four portals in the lower seam (Hiawatha Seam) at the No. 3 Mine; One haulage, on intake air, two return air. There were three portals in the upper seam (Castle Gate "A" Seam) at the No. 6 Mine: One haulage, one intake air, one return air. All portals have been sealed.

All major disturbance was performed prior to the enactment of P.L. 95-87, and methods of site selection and preparation were not conducted per existing regulations. Roads and pads were constructed with a cut and fill technique and no topsoil was saved. All surface facilities were sited on privately owned surface.

Reclamation

Final reclamation of the Gordon Creek No. 3/6 Mines started on September 15, 1985, and was completed on November 30, 1986. The work consisted of structure demolition, sealing of 7 portals, regrading and backfilling of pad and road areas, soil placement, road ripping and regrading, reseeding and drainage control in accordance with the approved reclamation plan.

Minor reseeding was done on the slope above the No. 6 stockpile area in early 1997, to ensure adequate vegetative cover. No other reseeding has been done at this site. There has been an on-going effort to eradicate noxious weeds, such as Musk Thistle.

Phase I Bond Release was granted on the reclamation on June 26, 1987. Phase II Bond Release was granted on January 9, 1995. An application for Phase III or Final Bond Release was filed with the Division on September 16, 1996.

MOUNTAIN COAL COMPANY

GORDON CREEK NO. 3/6 MINES

PHASE III BOND RELEASE

Casing / Sealing of Wells

Casing / Sealing of Wells

There were no wells associated with the Gordon Creek No, 3/6 Mines.

There was one surface drill hole on the Permit Area - DH-1-76. This hole was recorded to have been plugged and capped with concrete.

MOUNTAIN COAL COMPANY

GORDON CREEK NO. 3/6 MINES

PHASE III BOND RELEASE

Water Monitoring Summary

Water Monitoring Summary

Water monitoring results have been summarized for all stations monitored since reclamation. One monitoring station (3-3-W) was for underground water and was discontinued long before reclamation occurred.

Based on available data, there is no evidence of surface or subsurface impacts to the area. The water quality of both the runoff and water contained on the permanent sediment pond meets the requirements for the post-mining land use, which is stock and wildlife grazing.

The attached sheets will show the summarized water monitoring results.

WATER MONITORING REPORT
MOUNTAIN COAL COMPANY
E. STREAM
3-1-W

	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
FLOW	11	1.8	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
pH-F	8.1	8								
pH-L	NA	NA								
TEMP	4	1								
S.C.-F	1640	690								
S.C.-L	NA	NA								
TDS	1060	355								
TSS	61	1.36								
O&G	NA	NA								
$CaCO_3$	806	240								
A $CaCO_3$	356	<1								
Al $CaCO_3$	NA	NA								
Hd $CaCO_3$	NA	NA								
Ac $CaCO_3$	NA	NA								
HCO_3	422	NA								
CO_3^{-2}	0	0								
Cl^-	94	82								
SO_4^{-2}	458	88								
Ca	100	60								
Mg	135	22								
K	8	5								
Na	61	33								
CAT / AN	.31%	.16%								
Fe	0.88	5.87								
Mn	0.04	0.1								

NA- NOT APPLICABLE

WATER MONITORING REPORT
MOUNTAIN COAL COMPANY
SEDIMENT POND
3-2-W

	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
FLOW	DRY	DRY	DRY	DRY	2.7	DRY	DRY	DRY	DRY	DRY
pH-F					8.1					
pH-L										
TEMP					6					
S.C.-F					NA					
S.C.-L					NA					
TDS					172					
TSS					870					
O&G					NA					
$CaCO_3$										
A $CaCO_3$										
Al $CaCO_3$					112					
Hd $CaCO_3$					110					
Ac $CaCO_3$					0					
HCO_3					137					
CO_3^{-2}					0					
Cl^-					5.62					
SO_4^{-2}					13.8					
Ca					41.4					
Mg					1.73					
K					4.03					
Na					6.6					
CAT / AN					1.56					
Fe					25					
Mn					.57					

NA- NOT APPLICABLE

WATER MONITORING REPORT
MOUNTAIN COAL COMPANY
E. STREAM
3-4-W

	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
FLOW	16	1.6	DRY	DRY	DRY	DRY	2	DRY	DRY	DRY
pH-F	7.8	8.1					7.8			
pH-L	NA	NA					NA			
TEMP	1	2					15			
S.C.-F	330	490					NA			
S.C.-L	NA	NA					NA			
TDS	192	757					805			
TSS	216	43					3			
O&G	NA	NA					NA			
$CaCO_3$	148	556					NA			
A $CaCO_3$	119	<1					NA			
Al $CaCO_3$	NA	NA					374			
Hd $CaCO_3$	NA	NA					603			
Ac $CaCO_3$	NA	NA					NA			
HCO_3	145	309					457			
CO_3^{-2}	0	0					0			
Cl^-	18	66					62			
SO_4^{-2}	41	287					277			
Ca	30	163					110			
Mg	18	37					81			
K	5	7					6.8			
Na	18	47					45			
CAT / AN	3.55	1.68					2.76			
Fe	9.02	0.84					0.21			
Mn	0.1	0.04					<.02			

NA- NOT APPLICABLE

MOUNTAIN COAL COMPANY

GORDON CREEK NO. 3/6 MINES

PHASE III BOND RELEASE

Retained Roads

Retained Roads

There were two types of roads within the permit area: (1) coal haul roads and (2) mine access roads. The coal haul road was approximately 5000-feet inside the permit boundary and connects to the Carbon County road in Gordon Creek Canyon. This road is located on privately-owned surface, and at the landowners request, was left in place to provide access to the Coal Canyon Area as well as to the UP&L powerline access. This road was built and maintained as a class I haulroad.

The mine access road was used for men and material access to the upper portals. This road is approximately 2,400 feet long. This road originates on privately-owned surface and crosses through a portion of State surface to reach the upper portal pad which is on private surface. This road was built and maintained as a class II Road, and once again, at the landowner's request, was left in place to provide access to the upper pad area as well as to the UP&L powerline road.

Access to Coal Canyon is controlled by private surface owners and locked gates; therefore, none of the roads in the permit area are considered public roads.

During reclamation, the road width of the main haul road was reduced from approximately 30' to 16' and the width of the portal access road was reduced from approximately 20' to 12' by ripping and reseeding the shoulders. The roads were also resurfaced with 6" of 3/4" gravel at that time. All drainage controls were left in place to ensure long-term hydrologic protection. Revegetation of the shoulders and ditches, as well as minimal traffic use help minimize additional sediment contributions to streamflow.

The roads and drainage controls have been maintained throughout the reclamation liability period according to the approved plan and design. These roads are meeting the post-mining land use, since they have been left at the landowner's request, and they are providing necessary access to the UP&L powerline and private property beyond the minesite.

MOUNTAIN COAL COMPANY

GORDON CREEK NO. 3/6 MINES

PHASE III BOND RELEASE

Vegetation Information

REVEGETATION OF THE GORDON CREEK 3 & 6 MINES

A TWO-YEAR DATA COMPARISON OF THE RECLAIMED AREAS, REFERENCE AREA, AND REVEGETATION STANDARDS

1995 - 1996

Prepared by

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June 1997

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REVEGETATION OF THE GORDON CREEK 3 & 6 MINES

A TWO-YEAR DATA COMPARISON OF THE RECLAIMED AREAS, REFERENCE AREAS, AND REVEGETATION STANDARDS

1995-1996

SCOPE

The purpose of this document is to show a comparison of two consecutive years of vegetation data of a mine area that has been reclaimed for at least 10 years. Comparisons can be made between the reclaimed areas, a reference area, and criteria chosen previously to represent final revegetation success standards.

INTRODUCTION

Vegetation sampling has been conducted in various degrees of detail for the entire 10-year period. The 10-year period represents the responsibility period determined by state regulations following reclamation of a mine site. The reclamation bond posted by the operator cannot be released until vegetation parameters are "equal or exceed the approved success standard during the growing seasons for the last two years of the responsibility period".

The last two years vegetation reports have been included in this document as an *Addendum*.

These reports were called:

Vegetation Monitoring:
Reclaimed Areas of the
Gordon Creek No. 3 & 6 Mines
1995

Vegetation Monitoring:
Reclaimed Areas of the
Gordon Creek No. 3 & 6 Mines
1996

This document was written to summarize these data sets and to make comparisons between years, including comparisons between the reclaimed areas, the predetermined standard for revegetation success and the vegetation reference area -- or an undisturbed area selected previously in a plant community similar to the one that has been disturbed by mining activities.

General site descriptions and a vegetation sampling histories have been included in the aforementioned previous years sample reports mentioned above.

METHODS

With the exception of exact sample locations, quantitative sampling methods between years 1995 and 1996 were virtually identical, therefore comparisons between data sets were much facilitated. In an attempt to simplify this report and to minimize repetition, the vegetation monitoring reports for the years 1995 and 1996 have been submitted along with this document in their entirety.

Each of the reports provide a 'Methods' section that fully describes the methodologies used for sampling and analyzing the data sets for those years. Methods and parameters previously described include those for sampling and analyzing cover, composition, frequency, woody species density, productivity, sample adequacy, and diversity. Raw data, summary tables, literature cited, sample maps, graphs, figures, and color photographs were also included in the reports Methods described herein have therefore been limited to procedures and analyses used to compare data for this report.

Sample Adequacy & Statistical Comparisons

As recommended by the State of Utah, Division of Oil, Gas & Mining (DOGM) guidelines, sampling adequacy was recalculated using formulas from Cochran (1977), with the goal of 90% confidence level with a 10% change in mean (one-tailed t-value was used). The formula used is given below.

$$nMIN = \frac{t^2 s^2}{(dx)^2}$$

where,

nMIN	= minimum adequate sample
t	= appropriate confidence t-value
s	= standard deviation
x	= sample mean
d	= desired change from mean

Student's t-tests were employed to compare the reclaimed and reference areas of the sites for

cover, density and productivity. All sample means, standard deviations, and sample sizes were included in this report to enable the reviewers to check or apply further statistical tests if desired.

Diversity

There are several good methods to assess diversity in plant communities. One diversity index has been reported in this document for the reclaimed and reference areas (MacArthur's diversity index).

MacArthur's diversity index is an effective diversity measurement and is computed using the equation $1/\sum pi^2$ (MacArthur and Wilson 1976, *The Theory of Island Biogeography*, Princeton: Princeton University Press). In this equation *pi* is the proportion of sum frequency contributed by the *i*th species in the sample area of concern. The proportional contribution of each species is then squared and the values for all species in the sample areas are summed. This index integrates the number of species and the degree to which frequency of occurrence was equitably distributed among those species. In other words, this index provides greater weight to those species that are present more often (with greater frequency) than those that are merely "present" in one or two quadrats.

RESULTS

Summaries of results from sampling the vegetation in 1995 and 1996 have been provided in Tables 1-7. These tables provide the final results for the: 1) reclaimed areas, 2) reference areas,

and 3) predetermined standards of revegetation success. All sample means and standard deviations have been included to provide data for additional statistical analyses. *Statistical analyses comparing reclaimed areas to revegetation standards have not been provided in this document because the final standards for revegetation success are fixed numbers and do not have standard deviations associated with them.* However, statistical analyses have been performed comparing the reclaimed areas with the reference area (numerical results not included). With the exception of density, all parameters of the reclaimed areas exceeded those of the reference area. Below are the results of the comparisons for cover, density, productivity and diversity.

Cover

Total living cover results in 1995 were 50.75% for the reclaimed areas, 42.83% for the reference area, and 37.00% for the standard (Table 1). Table 1 also shows the cover results for 1996. They were 59.50% for the reclaimed areas, 47.00% for the reference area, and 37.00% for the final predetermined revegetation success standard .

Density

Results of woody species density (measured as number of individuals per acre) in 1995 were 1,945 for the reclaimed areas, 7,966 in the reference area, and 1,000 for the final standard. Results in 1996 had a similar trend with 1,814 in the reclaimed areas, 7,318 in the reference area, and 1,000 for the final standard (Table 2).

Productivity

Annual production results (total air dried biomass in pounds per acre) for the communities were also reported. Results show the productivity to be 1,100.15 lbs. per acre in 1995 for the reclaimed areas, 408.09 in the reference area, and 640.00 for the revegetation standard. The 1996 results for productivity were 823.23 lbs. per acre for the reclaimed areas, 365.88 in the reference area and 640.00 for the standard. (Table 3).

Diversity

Unlike the previous parameters, a specific diversity standard was not determined beforehand. However, state regulations require that reclaimed plant communities be "diverse, effective, and permanent..." . Therefore, MacArthur's diversity index was calculated comparing the reclaimed areas with the reference area. The 1995 diversity index for the reclaimed communities was 11.11 (Table 4) compared to 5.58 for the reference area (Table 5). In 1996, the diversity index for the reclaimed areas was 9.09 (Table 6) compared to 6.25 for the reference area (Table 7).

SUMMARY

As indicated in the Results sections above, the reclaimed areas in the Gordon Creek 3 & 6 mine site were greater when compared to each standard of success or reference area standard for cover, woody species density, productivity and diversity.

TABLE 1: Percent total living cover comparisons at the Gordon Creek 3 & 6 mine site.

	1995				1996			
AREA	$\bar{x}$	s	n	*n*MIN	$\bar{x}$	s	n	*n*MIN
RECLAIMED (A)	61.00	9.95	10	-----	62.00	9.27	10	-----
RECLAIMED (B)	50.00	5.48	10	-----	55.00	5.02	10	-----
RECLAIMED (C)	49.50	11.72	10	-----	49.50	8.79	10	-----
RECLAIMED (D)	50.50	8.79	10	-----	62.50	10.78	10	-----
RECLAIMED (E)	52.00	7.48	10	-----	72.00	7.48	10	-----
RECLAIMED (F)	46.50	4.50	10	-----	57.50	7.50	10	-----
RECLAIMED (G)	52.50	7.83	10	-----	58.00	7.48	10	-----
RECLAIMED (H)	45.00	10.25	10	-----	59.00	7.68	10	-----
RECLAIMED (A-H)	**50.75**	**9.56**	**80**	**5.81**	**59.50**	**10.62**	**80**	**5.22**
REFERENCE AREA	**42.83**	**7.92**	**30**	**5.60**	**47.00**	**9.27**	**30**	**6.37**
REVEG. STANDARD	**37.00**	--	--	--	**37.00**	--	--	--

$\bar{x}$ = mean percent cover
s = standard deviation
n = sample size
*n*MIN = minimum adequate sample

TABLE 2: Woody species density (number of individuals per acre) comparisons at the Gordon Creek 3 & 6 mine site.

	1995				1996			
AREA	$\bar{x}$	s	n	*n*MIN	$\bar{x}$	s	n	*n*MIN
RECLAIMED (A)	980.10	492.34	8	-----	304.92	323.05	8	-----
RECLAIMED (B)	1023.66	237.59	8	-----	1176.12	415.54	8	-----
RECLAIMED (C)	827.64	226.34	8	-----	1254.53	213.40	10	-----
RECLAIMED (D)	1633.50	529.48	8	-----	1858.56	365.03	12	-----
RECLAIMED (E)	1851.30	443.69	8	-----	2160.58	648.21	10	-----
RECLAIMED (F)	3767.94	1341.02	8	-----	2787.84	1256.46	10	-----
RECLAIMED (G)	522.72	150.90	8	-----	644.69	191.66	10	-----
RECLAIMED (H)	5056.96	1829.52	8	-----	3542.88	1263.16	12	-----
RECLAIMED (A-H)	**1944.80**	**1711.45**	**64**	**126.8**	**1814.27**	**1268.99**	**80**	**80.1**
REFERENCE AREA	**7965.51**	**1607.77**	**3(150)**	**6.67**	**7318.08**	**1426.93**	**30(150)**	**6.23**
REVEG. STANDARD	**1000.00**	**--**	**--**	**--**	**1000.00**	**--**	**--**	**--**

$\bar{x}$ = mean number of individuals per acre
s = standard deviation
n = sample size
*n*MIN = minimum adequate sample

TABLE 3: Total annual biomass production (lbs. per acre) comparisons at the Gordon Creek 3 & 6 mine site.

	1995					1996			
AREA	$\bar{x}$	s	n	*n*MIN		$\bar{x}$	s	n	*n*MIN
RECLAIMED (A)	1452.04	504.14	25(5)	-----		1140.53	806.97	50(10)	-----
RECLAIMED (B)	1648.46	756.23	25(5)	-----		1119.21	704.31	50(10)	-----
RECLAIMED (C)	932.88	335.67	25(5)	-----		699.16	409.77	50(10)	-----
RECLAIMED (D)	760.05	302.66	25(5)	-----		774.02	356.11	50(10)	-----
RECLAIMED (E)	1241.99	326.14	25(5)	-----		948.53	382.51	50(10)	-----
RECLAIMED (F)	616.24	165.60	25(5)	-----		651.64	205.33	50(10)	-----
RECLAIMED (G)	1323.94	518.68	25(5)	-----		795.97	581.05	50(10)	-----
RECLAIMED (H)	761.55	368.12	25(5)	-----		456.75	301.50	50(10)	-----
RECLAIMED (A-H)	**1100.15**	**579.46**	**40(200)**	**45.4**		**823.23**	**532.41**	**80(200)**	**68.5**
REFERENCE AREA	**408.09**	**79.24**	**30(150)**	**6.1**		**365.88**	**298.74**	**30(150)**	**109.2**
REVEG. STANDARD	**640.00**	--	--	--		**640.00**	--	--	--

$\bar{x}$ = mean dry-weight pounds per acre
s = standard deviation
n = sample size
*n*MIN = minimum adequate sample

Table 4: 1995 Diversity Data

GORDON CREEK 3/6
Reclaimed Areas A-H

	Lifeform	% Cover	Rel. Cover	Freq.	pi^2
Agropyron cristatum	Grass	0.06	0.12	1.25	0.00001
Artemisia nova	Shrub	0.13	0.25	1.25	0.00001
Artemisia tridentata	Shrub	1.75	3.45	13.75	0.00157
Aster foliaceus	Forb	1.13	2.22	7.50	0.00047
Atriplex canescens	Shrub	0.13	0.25	1.25	0.00001
Bromus tectorum	Grass	0.75	1.48	7.50	0.00047
Bromus carinatus	Grass	0.06	0.12	1.25	0.00001
Ceratoides lanata	Shrub	0.19	0.37	2.50	0.00005
Chrysothamnus nauseosus	Shrub	2.81	5.54	26.25	0.00571
Cynoglossum officinale	Forb	0.44	0.86	3.75	0.00012
Elymus cinereus	Grass	15.63	30.79	47.50	0.01868
Elymus hispidus	Grass	0.06	0.12	1.25	0.00001
Elymus spicatus	Grass	8.81	17.36	51.25	0.02175
Elymus lanceolatus	Grass	7.00	13.79	47.50	0.01868
Epilobium halleanum	Forb	0.31	0.62	6.25	0.00032
Eriogonum sp.	Forb	0.06	0.12	1.25	0.00001
Eriogonum corymbosum	Shrub	0.13	0.25	1.25	0.00001
Grindelia squarrosa	Forb	0.06	0.12	1.25	0.00001
Gutierrezia sarothrae	Shrub	0.25	0.49	2.50	0.00005
Hedysarum boreale	Forb	0.13	0.25	1.25	0.00001
Kochia prostrata	Shrub	1.56	3.08	11.25	0.00105
Kochia scoparia	Forb	0.19	0.37	2.50	0.00005
Lactuca serriola	Forb	0.06	0.12	1.25	0.00001
Machaeranthera grindelioides	Forb	0.06	0.12	1.25	0.00001
Machaeranthera canescens	Forb	1.38	2.71	21.25	0.00374
Medicago sativa	Forb	4.50	8.87	47.50	0.01868
Melilotus officinalis	Forb	0.69	1.35	11.25	0.00105
Poa secunda	Grass	0.38	0.74	6.25	0.00032
Poa pratensis	Grass	1.31	2.59	12.50	0.00129
Polygonum aviculare	Forb	0.06	0.12	1.25	0.00001
Rosa woodsii	Shrub	0.25	0.49	1.25	0.00001
Salsola pestifer	Forb	0.31	0.62	1.25	0.00001
Symphoricarpos oreophilus	Shrub	0.13	0.25	1.25	0.00001
TOTALS		50.75	100.00	347.50	0.09

$1/\Sigma P_i^2$ **= 11.11**

Table 5: 1995 Diversity Data					
Gordon Creek 3/6 Reference Area	LIFEFORM	% COVER	REL. COVER	FREQ.	pi^2
Artemisia frigida	Shrub	15.83	36.97	100.00	0.07176
Asclepias sp.	Forb	0.07	0.16	3.33	0.00008
Astragalus mollissimus	Forb	0.50	1.17	30.00	0.00646
Cercocarpos montanus	Shrub	1.67	3.89	16.67	0.00199
Chrysothamnus depressus	Shrub	0.50	1.17	10.00	0.00072
Elymus salinus	Grass	15.17	35.41	100.00	0.07176
Eriogonum corymbosum	Shrub	2.00	4.67	10.00	0.00072
Gutierrezia sarothrae	Shrub	1.00	2.33	16.67	0.00199
Hedysarum boreale	Forb	3.83	8.95	43.33	0.01347
Machaeranthera grindelioides	Forb	1.83	4.28	36.64	0.00963
Stipa hymenoides	Grass	0.43	1.01	6.67	0.00032
TOTALS		42.83	100.01	373.31	0.17890
$1/\Sigma P_i^2$ = **5.58**					

Table 6: 1996 Diversity Data

GORDON CREEK 3/6
Reclaimed Areas A-H

	LIFEFORM	% COVER	REL. Cover	FREQ.	pi^2
Artemisia tridentata	Shrub	3.38	5.67	23.75	0.00386
Artemisia nova	Shrub	0.13	0.21	2.50	0.00004
Aster foliaceus	Forb	0.50	0.84	6.25	0.00027
Atriplex canescens	Shrub	0.13	0.21	1.25	0.00001
Bromus carinatus	Grass	0.06	0.11	1.25	0.00001
Bromus tectorum	Grass	0.19	0.32	3.75	0.00010
Ceratoides lanata	Shrub	0.13	0.21	2.50	0.00004
Cercocarpus montanus	Shrub	0.50	0.84	1.25	0.00001
Chrysothamnus nauseosus	Shrub	3.00	5.04	18.75	0.00240
Cynoglossum officinale	Forb	0.13	0.21	2.50	0.00004
Dactylis glomeratus	Grass	0.13	0.21	1.25	0.00001
Elymus spicatus	Grass	9.44	15.86	60.00	0.02461
Elymus smithii	Grass	1.00	1.68	15.00	0.00154
Elymus lanceolatus	Grass	3.44	5.78	23.75	0.00386
Elymus salinus	Grass	2.88	4.83	13.75	0.00129
Elymus cinereus	Grass	18.19	30.57	75.00	0.03845
Epilobium halleanum	Forb	0.13	0.21	2.50	0.00004
Gutierrezia sarothrae	Shrub	0.31	0.53	3.75	0.00010
Hedysarum boreale	Forb	0.06	0.11	1.25	0.00001
Kochia prostrata	Shrub	1.94	3.26	12.50	0.00107
Machaeranthera grindelioides	Forb	0.31	0.53	6.25	0.00027
Machaeranthera canescens	Forb	0.31	0.53	3.75	0.00010
Medicago sativa	Forb	0.19	0.32	1.25	0.00001
Melilotus officinalis	Forb	8.50	14.29	65.00	0.02888
Poa pratensis	Grass	1.06	1.79	10.00	0.00068
Poa secunda	Grass	2.44	4.10	17.50	0.00209
Quercus gambelii	Shrub	0.44	0.74	2.50	0.00004
Sphaeralcea grossulariaefolia	Forb	0.13	0.21	2.50	0.00004
Stipa hymenoides	Grass	0.50	0.84	1.25	0.00001
TOTALS		59.50	100.00	382.50	0.10987

$1/\Sigma P_i^2$ **= 9.09**

Table 7: 1996 Diversity Data					
Gordon Creek 3/6 Reference Area					
	LIFEFORM	% COVER	REL. COVER	FREQ.	pi^2
Artemisia frigida	Shrub	12.03	25.60	86.67	0.05557
Astralagus mollissimus	Forb	0.67	1.42	13.33	0.00131
Cercocarpus montanus	Shrub	2.83	6.03	16.67	0.00206
Chrysothamnus viscidiflorus	Shrub	0.33	0.71	6.67	0.00033
Chrysothamnus depressa	Shrub	0.50	1.06	10.00	0.00074
Elymus salinus	Grass	18.67	39.72	100.00	0.07397
Eriogonum corymbosum	Shrub	2.83	6.03	13.33	0.00131
Gutierrezia sarothrae	Shrub	1.17	2.48	23.33	0.00403
Hedysarum boreale	Forb	3.23	6.88	50.00	0.01849
Machaeranthera grindelioides	Forb	0.83	1.77	20.00	0.00296
Petradoria pumila	Forb	0.07	0.14	3.33	0.00008
Pinus edulis	Shrub	0.83	1.77	6.67	0.00033
Purshia tridentata	Shrub	1.83	3.90	6.67	0.00033
Stipa hymenoides	Grass	0.83	1.77	13.33	0.00131
Tetradymia spinosa	Shrub	0.33	0.71	6.67	0.00033
TOTALS		47.00	100.00	376.67	0.16316
$1/\Sigma P_i^2$ = **6.25**					

ADDENDUM

Includes:

Vegetation Monitoring:
Reclaimed Areas
of the Gordon Creek No. 3 & 6 Mines
1995

Vegetation Monitoring:
Reclaimed Areas
of the Gordon Creek No. 3 & 6 Mines
1996

VEGETATION MONITORING: RECLAIMED AREAS OF THE GORDON CREEK NO. 3 & 6 MINES

1996

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VEGETATION MONITORING:

RECLAIMED AREAS OF THE GORDON CREEK NO. 3 & 6 MINES

1996

SCOPE

The following report has been prepared to assess the current condition of the vegetation of the reclaimed areas at the Gordon Creek No. 3 & 6 Mines. As was done in 1995, the reclaimed areas were compared with an undisturbed reference area that was used as a standard for revegetation success.

INTRODUCTION

General Site Description

A description of the site was submitted in previous reports, but is given again below.

The Gordon Creek No. 3 & 6 Mines are located in the Gordon Creek area of Carbon County, Utah. The elevation of the area lies

between 7,550 ft and 7,850 ft above sea level. Vegetation types adjacent to the mine area were oak-shrubland and sagebrush-grassland communities. The reclaimed areas of the mine site lie on a variety of slopes and exposures which are discussed further in the METHODS section of this report.

Sample History

MT. NEBO SCIENTIFIC, INC. has been involved with sampling the area in the recent past. In 1989 qualitative and quantitative sampling was conducted on the reclaimed areas of the mine sites. Also surveyed in 1989 was species survival of containerized transplants. Woody plant species density sampling was conducted in 1991, whereas, no vegetation sampling was done in 1992. In 1993 quantitative and qualitative sampling was conducted on the reclaimed areas and comparisons were made with the reference area. In 1995 intensive sampling was conducted in the area with the intention to make 2-year comparisons of the standards set for revegetation success for bond release.

METHODS

Methodologies used herein were performed in accordance with the guidelines supplied by the State of Utah, Division of Oil, Gas and Mining (DOGM). Other than exact sample locations, nearly identical methods were used in both 1995 and 1996 to facilitate

data comparisons between years.

Quantitative and qualitative data were taken on the vegetation of the reclaimed and reference areas. Sampling was conducted June 24 - June 27, 1996. The reclaimed areas were divided into sample areas (see Sample Map). Each of those areas consisted of several disturbance types (i.e. roads, pads, portals, regraded slopes, etc.).

Transect and Quadrat Placement

Transect lines for sampling were placed randomly throughout the reclaimed areas resulting in several sample sites (see Sample Map).

Random/regular placement of sampling quadrats were designed to decrease bias, yet encompass as much of the area as practical. These methods placed the sample locations objectively in a stratified-random fashion without "preconceived bias".

The transect lines were placed randomly in each area. Once this was done, regular points were marked on them. From these marks, a random number dictated the direction and distance to place the quadrats at right angles from the transect lines.

All reclaimed areas were seeded with the same seed mix on a

variety of slopes, exposures, soil conditions, and water relationships, etc. Data summaries are presented separately, then combined due to heterogeneity of this area. Reporting the data in this manner was an attempt to provide information of small, localized areas, yet also provide the average success of the entire mine site. The reference area was also sampled using the same methods and reports the data combined.

Cover and Composition

Cover estimates were made using ocular methods with meter square quadrats. Species composition and relative frequencies were also assessed from the quadrats. Additional information recorded on the raw data sheets were: estimated precipitation, slope, exposure, grazing use, animal disturbance and other appropriate notes. Plant nomenclature follows Welsh et al. (1993).

Woody Plant Species Density

Density of woody plant species of the reclaimed and reference areas were made using belt transects. These 5 ft by 50 ft belts were placed randomly throughout the study areas. Total number of individuals by species were counted in each of the belt transects. The average number was then calculated followed by the number of individuals per acre.

Production

Total annual biomass production was estimated by clipping, drying and weighing current annual growth. "Double sampling" using four quadrats estimated around the clipped and weighed plot was implemented.

Sample sizes (n) shown on the tables report one number followed by another number in parenthesis. The first number is the sample size including clipped-and-weighed samples and estimated plots from "double sampling". The number in parenthesis is the total number of clipped-and-weighed samples.

Sample Adequacy & Statistical Comparisons

Sampling adequacy was calculated using formulas from Cochran (1977), with the goal of 90% confidence level with a 10% change in mean (one-tailed t-value was used). The formula used is given below.

$$nMIN = \frac{t^2 s^2}{(dx)^2}$$

where,

nMIN	= minimum adequate sample
t	= appropriate confidence t-value
s	= standard deviation
x	= sample mean
d	= desired change from mean

Student's t-tests were employed to compare the reclaimed and reference areas of the sites for cover, density and productivity. All sample means, standard deviations, and sample sizes were included in this report to enable the reviewers to check or apply further statistical tests if desired.

Photographs

Color photographs of the reclaimed and reference sample areas were taken at the time of sampling and have been submitted with this report.

Raw Data

The raw data for cover, composition and frequency have been summarized on a spreadsheet and are included in this report in Appendix A.

RESULTS

Reclaimed Areas (Areas A-H, separately)

To first get an idea of the sample results for each reclaimed area individually, summaries were compiled of each area separately [areas A-H (see Sample Map)]. Tables 1 through 16 summarize the results of the sampling for these areas. The

tables include total cover, lifeform composition, cover by species, species frequency, sample sizes, woody plant species density, and productivity.

Cover of each of the reclaimed areas ranged from 49.50% to 72.00%. Like the 1995 data suggested, grass species were the most important lifeform by *composition* in each of the reclaimed areas by a wide margin. Relative importance of forbs and woody plant species varied depending on the area. Woody plant species *density* of each of the areas when summarized separately ranged from 305 to 3,543 individuals per acre. *Production* of each area ranged between 651.64 to 1140.53 lbs. per acre.

<u>Reclaimed Areas</u> (Areas A-H, combined)

When the data of the reclaimed areas were combined to show the success of the revegetation of the mine site as a whole, the following results were found.

Cover of the combined areas was estimated as 59.50% (Table 17-A). As one would expect by the results described above for each area separately, grasses were by far the most important lifeform in the combined results, followed distantly by forbs and woody species. Forbs and woody species were near equally represented (Tables 17-B).

Density of the woody plant species of the combined reclaimed areas was 1,814 individuals per acre (Table 18-A). Productivity was estimated to be 823.23 lbs. per acre, most of which was herbaceous biomass (Table 18-B).

Reference Area

Total living cover of the Reference Area was 47.00% (Table 19A). Shrubs dominated the composition of the area comprising 48.57%, followed by grasses and forbs at 40.75% and 10.67%, respectively.

The dominant individual plant species, however, was the grass, Salina wildrye (*Elymus salinus*). The cover of this plant was estimated at 18.67%. Next in dominance was the shrub called fringed sagebrush (*Artemisia frigida*) at 12.03% and the forb, northern sweetvetch *(Hedysarum boreale*) at 3.23% (see Table 19-C).

Woody species density of the reference area was estimated to be 7,318 individuals per acre (Table 20-A). Productivity of the area was 365.88 pounds per acre (Table 20-B).

DISCUSSION

Cover

As mentioned above, the *cover* of each of the reclaimed areas (A-H, separately) ranged from 49.50% to 72.00%. The total living cover of the reference area was 47.00% (Table 19). Each reclaimed area was statistically greater than or equal to the cover of the reference area.

Total living cover of the all reclaimed areas combined was 59.50%. This cover value was also statistically greater than the reference area (see Table 21).

The predetermined success standards for revegetation of the Gordon Creek 3/6 mines are given in Appendix 9 of the Mining and Reclamation Plan (MRP). The standard for cover of the area is 37.00%.

The results of this report suggest that the Gordon Creek reclaimed mine site area met or exceeded Reference Area standards and other standards predetermined for revegetation success in 1996.

Density

Also reported in the Results section above, the woody plant species *density* of each of the areas when summarized separately ranged from 305 to 3,543 individuals per acre. The mean density of all areas combined was 1,814 individuals per acre.

The standard set for the density of the reclaimed area according to Appendix 9 in the MRP was 1,000 individuals per acre. Therefore, the mean density for all reclaimed areas of the Gordon Creek 3/6 mines exceeded the standard for revegetation success in the 1996 data.

Productivity

Production of each reclaimed area ranged between 651.64 to 1,140.53 lbs. per acre. The mean productivity of all areas combined was 823.23 lbs. per acre. The standard for production was previously set at 640 lbs. per acre. Therefore, the productivity of the reclaimed area exceeded that of the reference area by a statistically significant margin (see Table 21) and also exceeded the predetermined standard of 640 lbs. per acre.

In conclusion, all parameters met or exceeded those of the reference area and those standards set for revegetation success in the MRP for Gordon Creek 3/6 mines.

TABLE 1: Summary of total cover, composition and cover by species for the reclaimed areas of the Gordon Creek 3 & 6 Mines (Area "A", see Sample Map).

A.

TOTAL COVER	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE
Living Cover	62.00	9.27	10
Litter	17.00	8.72	10
Bareground	9.50	6.41	10
Rock	11.50	6.64	10

B.

COMPOSITION	PERCENT	STANDARD DEVIATION	SAMPLE SIZE
Shrubs	0.00	0.00	10
Forbs	6.00	9.98	10
Grasses	94.00	9.98	10

C.

COVER BY SPECIES	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE	RELATIVE FREQUENCY
Trees & Shrubs				
Forbs				
Aster foliaceus	1.50	3.20	10	20.00
Cynoglossum officinalis	0.50	1.50	10	10.00
Machaeranthera canescens	1.50	4.50	10	10.00
Grasses				
Bromus carinatus	0.50	1.50	10	10.00
Elymus spicatus	12.00	9.80	10	70.00
Elymus cinereus	37.00	21.59	10	90.00
Elymus lanceolatus	8.50	12.66	10	30.00
Poa pratensis	0.50	1.50	10	10.00

TABLE 2: Summary for woody species density and annual production for the reclaimed areas of the Gordon Creek 3 & 6 Mines (Area "A", see Sample Map).

A.

WOODY SPECIES DENSITY	NUMBER/ACRE
Artemisia tridentata	174.24
Ceratoides lanata	21.78
Cercocarpus montanus	21.78
Symphoricarpos oreophilus	87.12
TOTAL	304.92

B.

ANNUAL PRODUCTION

LIFEFORM	LBS/ ACRE	STANDARD DEVIATION	SAMPLE* SIZE
Herbaceous	1091.58	317.20	50(10)
Woody Spp.	48.95	39.56	50(10)
TOTAL	1140.53	806.97	50(10)

* Number in parentheses show total clipped-and-weighed samples.

TABLE 3: Summary of total cover, composition and cover by species for the reclaimed areas of the Gordon Creek 3 & 6 Mines (Area "B", see Sample Map).

A.

TOTAL COVER	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE
Living Cover	55.50	10.11	10
Litter	11.50	5.02	10
Bareground	15.00	8.94	10
Rock	18.00	10.30	10

B.

COMPOSITION	PERCENT	STANDARD DEVIATION	SAMPLE SIZE
Shrubs	28.48	25.77	10
Forbs	12.62	8.51	10
Grasses	58.90	26.29	10

C.

COVER BY SPECIES	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE	RELATIVE FREQUENCY
Trees & Shrubs				
Artemisia tridentata	4.50	7.89	10	30.00
Cercocarpus montanus	4.00	12.00	10	10.00
Chrysothamnus nauseosus	4.50	10.59	10	20.00
Gutierrezia sarothrae	0.50	1.50	10	10.00
Quercus gambelii	3.50	7.76	10	20.00
Forbs				
Cynoglossum officinale	0.50	1.50	10	10.00
Epilobium brachycarpum	1.00	2.00	10	20.00
Melilotus officinalis	5.50	4.72	10	70.00
Grasses				
Bromus tectorum	1.50	2.29	10	30.00
Elymus cinereus	11.00	17.15	10	50.00
Elymus lanceolatus	2.00	4.00	10	20.00
Elymus smithii	4.50	9.07	10	20.00
Elymus spicatus	5.00	8.37	10	30.00
Elymus salinus	2.50	7.50	10	10.00
Poa pratensis	1.00	3.00	10	10.00
Stipa hymenoides	4.00	12.00	10	10.00

TABLE 4: Summary for woody species density and annual production for the reclaimed areas of the Gordon Creek 3 & 6 Mines (Area "B", see Sample Map).

A.

WOODY SPECIES DENSITY	NUMBER/ACRE
Artemisia tridentata	718.74
Cercocarpus montanus	87.12
Chrysothamnus nauseosus	239.58
Quercus gambelii	130.68
TOTAL	1176.12

B.

ANNUAL PRODUCTION

LIFEFORM	LBS/ ACRE	STANDARD DEVIATION	SAMPLE* SIZE
Herbaceous	775.45	320.57	50(10)
Woody Spp.	343.76	110.17	50(10)
TOTAL	1119.21	704.31	50(10)

* Number in parentheses show total clipped-and-weighed samples.

TABLE 5: Summary of total cover, composition and cover by species for the reclaimed areas of the Gordon Creek 3 & 6 Mines (Area "C", see Sample Map).

A.

TOTAL COVER	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE
Living Cover	49.50	8.79	10
Litter	12.50	5.12	10
Bareground	16.00	6.63	10
Rock	22.00	10.54	10

B.

COMPOSITION	PERCENT	STANDARD DEVIATION	SAMPLE SIZE
Shrubs	7.72	10.11	10
Forbs	31.11	15.11	10
Grasses	61.17	17.71	10

C.

COVER BY SPECIES	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE	RELATIVE FREQUENCY
Trees & Shrubs				
Artemisia tridentata	1.50	3.20	10	20.00
Chrysothamnus nauseosus	1.00	3.00	10	10.00
Gutierrezia sarothrae	1.00	3.00	10	10.00
Forbs				
Aster foliaceus	1.50	3.20	10	20.00
Machaeranthera grindelioides	1.00	2.00	10	20.00
Medicago sativa	1.50	4.50	10	10.00
Melilotus officinalis	11.50	8.67	10	100.00
Grasses				
Elymus cinereus	5.00	6.63	10	90.00
Elymus lanceolatus	1.50	4.50	10	10.00
Elymus smithii	2.00	4.00	10	20.00
Elymus spicatus	16.00	8.31	10	100.00

TABLE 6: Summary for woody species density and annual production for the reclaimed areas of the Gordon Creek 3 & 6 Mines (Area "C", see Sample Map).

A.

WOODY SPECIES DENSITY	NUMBER/ACRE
Artemisia tridentata	836.35
Ceratoides lanata	17.42
Chrysothamnus nauseosus	383.33
Eriogonum corymbosum	17.42
TOTAL	1254.53

B.

ANNUAL PRODUCTION

LIFEFORM	LBS/ ACRE	STANDARD DEVIATION	SAMPLE* SIZE
Herbaceous	562.59	153.85	50(10)
Woody Spp.	136.57	19.18	50(10)
TOTAL	699.16	409.77	50(10)

* Number in parentheses show total clipped-and-weighed samples.

TABLE 7: Summary of total cover, composition and cover by species for the reclaimed areas of the Gordon Creek 3 & 6 Mines (Area "D", see Sample Map).

A.

TOTAL COVER	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE
Living Cover	62.50	10.78	10
Litter	8.00	3.32	10
Bareground	9.00	4.90	10
Rock	20.50	11.06	10

B.

COMPOSITION	PERCENT	STANDARD DEVIATION	SAMPLE SIZE
Shrubs	16.65	13.43	10
Forbs	38.96	20.50	10
Grasses	44.39	24.03	10

C.

COVER BY SPECIES	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE	RELATIVE FREQUENCY
Trees & Shrubs				
Artemisia tridentata	3.00	6.40	10	20.00
Chrysothamnus nauseosus	6.00	6.63	10	50.00
Kochia prostrata	1.00	3.00	10	10.00
Forbs				
Aster	1.00	3.00	10	10.00
Hedysarum boreale	0.50	1.50	10	10.00
Melilotus officinalis	22.50	14.01	10	100.00
Grasses				
Dactylis glomeratus	1.00	3.00	10	10.00
Elymus salinus	10.54	50.00	10	50.00
Elymus cinereus	7.00	12.49	10	40.00
Elymus lanceolatus	2.50	7.50	10	10.00
Elymus smithii	0.50	1.50	10	10.00
Elymus spicatus	6.50	8.96	10	50.00
Poa pratensis	7.48	20.00	10	20.00

TABLE 8: Summary for woody species density and annual production for the reclaimed areas of the Gordon Creek 3 & 6 Mines (Area "D", see Sample Map).

A.

WOODY SPECIES DENSITY	NUMBER/ACRE
Artemisia tridentata	914.76
Chrysothamnus nauseosus	827.64
Kochia prostrata	116.16
TOTAL	1858.56

B.

ANNUAL PRODUCTION

LIFEFORM	LBS/ ACRE	STANDARD DEVIATION	SAMPLE* SIZE
Herbaceous	703.59	137.69	50(10)
Woody Spp.	70.43	20.77	50(10)
TOTAL	774.02	356.11	50(10)

* Number in parentheses show total clipped-and-weighed samples.

TABLE 9: Summary of total cover, composition and cover by species for the reclaimed areas of the Gordon Creek 3 & 6 Mines (Area "E", see Sample Map).

A.

TOTAL COVER	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE
Living Cover	72.00	7.48	10
Litter	13.50	3.20	10
Bareground	6.80	4.69	10
Rock	7.70	6.59	10

B.

COMPOSITION	PERCENT	STANDARD DEVIATION	SAMPLE SIZE
Shrubs	16.62	13.56	10
Forbs	7.46	7.55	10
Grasses	75.93	15.72	10

C.

COVER BY SPECIES	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE	RELATIVE FREQUENCY
Trees & Shrubs				
Artemisia nova	1.00	3.00	10	10.00
Atriplex canescens	1.00	3.00	10	10.00
Chrysothamnus nauseosus	3.00	6.40	10	20.00
Kochia prostrata	7.50	10.06	10	50.00
Forbs				
Melilotus officinalis	5.00	5.00	10	50.00
Grasses				
Elymus cinereus	37.50	17.07	10	100.00
Elymus spicatus	17.00	9.27	10	90.00

TABLE 10: Summary for woody species density and annual production for the reclaimed areas of the Gordon Creek 3 & 6 Mines (Area "E", see Sample Map).

A.

WOODY SPECIES DENSITY	NUMBER/ACRE
Artemisia tridentata	574.99
Atriplex canescens	17.42
Ceratoides lanata	52.27
Chrysothamnus nauseosus	766.66
Kochia prostrata	749.23
TOTAL	2160.58

B.

ANNUAL PRODUCTION

LIFEFORM	LBS/ ACRE	STANDARD DEVIATION	SAMPLE* SIZE
Herbaceous	847.67	143.89	50(10)
Woody Spp.	100.87	30.13	50(10)
TOTAL	948.53	382.51	50(10)

* Number in parentheses show total clipped-and-weighed samples.

TABLE 11: Summary of total cover, composition and cover by species for the reclaimed areas of the Gordon Creek 3 & 6 Mines (Area "F", see Sample Map).

A.

TOTAL COVER	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE
Living Cover	57.50	7.50	10
Litter	7.50	2.50	10
Bareground	18.50	5.02	10
Rock	16.50	6.34	10

B.

COMPOSITION	PERCENT	STANDARD DEVIATION	SAMPLE SIZE
Shrubs	19.16	18.72	10
Forbs	28.39	18.67	10
Grasses	52.45	15.70	10

C.

COVER BY SPECIES	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE	RELATIVE FREQUENCY
Trees & Shrubs				
Artemisia tridentata	8.50	8.08	10	60.00
Chrysothamnus nauseosus	1.50	4.50	10	10.00
Kochia prostrata	1.50	4.50	10	10.00
Forbs				
Machaeranthera canescens	1.00	2.00	10	20.00
Machaeranthera grindelioides	0.50	1.50	10	10.00
Melilotus officinalis	14.50	10.59	10	90.00
Grasses				
Elymus smithii	1.00	3.00	10	10.00
Elymus spicatus	14.00	12.41	10	70.00
Elymus cinereus	8.00	8.43	10	70.00
Elymus lanceolatus	2.00	3.32	10	30.00
Poa secunda	5.00	5.92	10	50.00

TABLE 12: Summary for woody species density and annual production for the reclaimed areas of the Gordon Creek 3 & 6 Mines (Area "F", see Sample Map).

A.

WOODY SPECIES DENSITY	NUMBER/ACRE
Artemisia nova	17.42
Artemisia tridentata	2509.06
Ceratoides lanata	17.42
Chrysothamnus nauseosus	156.82
Kochia prostata	69.70
Pinus ponderosa	17.42
TOTAL	2787.84

B.

ANNUAL PRODUCTION

LIFEFORM	LBS/ ACRE	STANDARD DEVIATION	SAMPLE* SIZE
Herbaceous	624.76	139.03	50(10)
Woody Spp.	26.87	6.29	50(10)
TOTAL	651.64	205.33	50(10)

* Number in parentheses show total clipped-and-weighed samples..

TABLE 13: Summary of total cover, composition and cover by species for the reclaimed areas of the Gordon Creek 3 & 6 Mines (Area "G", see Sample Map).

A.

TOTAL COVER	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE
Living Cover	58.00	7.48	10
Litter	10.50	4.15	10
Bareground	12.50	4.61	10
Rock	19.00	6.24	10

B.

COMPOSITION	PERCENT	STANDARD DEVIATION	SAMPLE SIZE
Shrubs	7.08	11.95	10
Forbs	13.22	9.38	10
Grasses	79.70	14.36	10

C.

COVER BY SPECIES	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE	RELATIVE FREQUENCY
Trees & Shrubs				
Ceratoides lanata	1.00	2.00	10	20.00
Gutierrezia sarothrae	1.00	3.00	10	10.00
Kochia prostata	2.00	6.00	10	10.00
Forbs				
Melilotus officinalis	7.50	5.12	10	90.00
Grasses				
Elymus salinus	12.50	12.89	10	50.00
Elymus spicatus	3.50	7.09	10	20.00
Elymus cinereus	19.50	13.87	10	90.00
Elymus lanceolatus	5.00	6.32	10	40.00
Poa secunda	6.00	16.40	10	20.00

TABLE 14: Summary for woody species density and annual production for the reclaimed areas of the Gordon Creek 3 & 6 Mines (Area "G", see Sample Map).

A.

WOODY SPECIES DENSITY	NUMBER/ACRE
Artemisia nova	17.42
Artemisia tridentata	348.48
Ceratoides lanata	52.27
Eriogonum corymbosum	34.85
Gutierrezia sarothrae	17.42
Kochia prostrata	139.39
Rosa woodsii	34.85
TOTAL	644.69

B.

ANNUAL PRODUCTION

LIFEFORM	LBS/ ACRE	STANDARD DEVIATION	SAMPLE* SIZE
Herbaceous	667.58	132.58	50(10)
Woody Spp.	128.39	67.22	50(10)
TOTAL	795.97	581.05	50(10)

* Number in parentheses show total clipped-and-weighed samples.

TABLE 15: Summary of total cover, composition and cover by species for the reclaimed areas of the Gordon Creek 3 & 6 Mines (Area "H", see Sample Map).

A.

TOTAL COVER	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE
Living Cover	59.00	7.68	10
Litter	6.00	2.00	10
Bareground	20.50	8.50	10
Rock	14.50	5.22	10

B.

COMPOSITION	PERCENT	STANDARD DEVIATION	SAMPLE SIZE
Shrubs	35.16	27.20	10
Forbs	6.09	6.98	10
Grasses	58.75	29.30	10

C.

COVER BY SPECIES	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE	RELATIVE FREQUENCY
Trees & Shrubs				
Artemisia tridentata	9.50	7.23	10	70.00
Chrysothamnus nauseosus	8.00	12.49	10	40.00
Kochia prostrata	3.50	7.76	10	20.00
Forbs				
Machaeranthera grindelioides	1.00	2.00	10	20.00
Melilotus officinale	1.50	3.20	10	20.00
Sphaeralcea grossulariifolia	1.00	2.00	10	20.00
Grasses				
Elymus cinereus	14.50	14.04	10	60.00
Elymus lanceolatus	6.00	8.89	10	40.00
Elymus spicatus	1.50	2.29	10	20.00
Poa pratensis	4.00	5.39	10	50.00
Poa secunda	8.50	8.08	10	70.00

TABLE 16: Summary for woody species density and annual production for the reclaimed areas of the Gordon Creek 3 & 6 Mines (Area "H", see Sample Map).

A.

WOODY SPECIES DENSITY	NUMBER/ACRE
Artemisia nova	174.24
Artemisia tridentata	1698.84
Atriplex canescens	14.52
Ceratoides lanata	14.52
Chrysothamnus nauseosus	1437.48
Kochia prostrata	203.28
TOTAL	3542.88

B.

ANNUAL PRODUCTION

LIFEFORM	LBS/ ACRE	STANDARD DEVIATION	SAMPLE* SIZE
Herbaceous	440.32	116.09	50(10)
Woody Spp.	16.43	6.63	50(10)
TOTAL	456.75	301.50	50(10)

* Number in parentheses show total clipped-and-weighed samples.

TABLE 17: Summary of total cover, composition and cover by species for the reclaimed areas of the Gordon Creek 3 & 6 Mines (Areas "A-H" combined, see Sample Map).

A.

TOTAL COVER	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE
Living Cover	59.50	10.62	80
Litter	10.81	5.78	80
Bareground	13.48	7.86	80
Rock	16.21	9.31	80

B.

COMPOSITION	PERCENT	STANDARD DEVIATION	SAMPLE SIZE
Shrubs	16.36	20.31	80
Forbs	17.98	17.79	80
Grasses	65.66	25.22	80

C.

COVER BY SPECIES	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE	RELATIVE FREQUENCY
Trees & Shrubs				
Artemisia nova	0.13	1.11	80	2.50
Artemisia tridentata	3.38	6.46	80	23.75
Atriplex canescens	0.13	1.11	80	1.25
Ceratoides lanata	0.13	0.78	80	2.50
Cercocarpus montanus	0.50	4.44	80	1.25
Chrysothamnus nauseosus	3.00	7.44	80	18.75
Gutierrezia sarothrae	0.31	1.65	80	3.75
Kochia prostrata	1.94	5.84	80	12.50
Quercus gambelii	0.44	2.98	80	2.50
Forbs				
Aster foliaceus	0.50	2.03	80	6.25
Cynoglossum officinale	0.06	0.56	80	2.50
Epilobium brachycarpum	0.13	0.78	80	2.50
Hedysarum boreale	0.06	0.56	80	1.25
Machaeranthera canescens	0.31	1.83	80	3.75

TABLE 17 (continued)

Machaeranthera grindelioides	0.31	1.21	80	6.25
Medicago sativa	0.19	1.67	80	1.25
Melilotus officinalis	8.50	10.32	80	65.00
Sphaeralcea grossulariaefolia	0.13	0.78	80	2.50
Grasses				
Bromus carinatus	0.06	0.56	80	1.25
Bromus tectorum	0.19	0.95	80	3.75
Dactylis glomerata	0.13	1.11	80	1.25
Elymus cinereus	18.19	18.66	80	75.00
Elymus lanceolatus	3.44	7.40	80	23.75
Elymus spicatus	9.44	10.40	80	60.00
Elymus salinus	2.88	7.86	80	13.75
Elymus smithii	1.00	3.98	80	15.00
Poa pratensis	1.06	3.77	80	10.00
Poa secunda	2.44	7.54	80	17.50
Stipa hymenoides	0.50	4.44	80	1.25

TABLE 18: Summary for woody species density and annual production for the reclaimed areas of the Gordon Creek 3 & 6 Mines (Areas "A-H" combined, see Sample Map).

A.

WOODY SPECIES DENSITY	NUMBER/ACRE
Artemisia nova	30.49
Artemisia tridentata	1014.95
Atriplex canescens	4.36
Cercocarpus montanus	10.89
Ceratoides lanata	21.78
Chrysothamnus nauseosus	527.08
Eriogonum corymbosum	6.53
Gutierrezia sarothrae	2.18
Kochia prostrata	167.71
Quercus gambelii	13.07
Pinus ponderosa	2.18
Rosa woodsii	4.36
Symphoricarpos oreophilus	8.71
TOTAL	1814.27

B.

ANNUAL PRODUCTION

LIFEFORM	LBS/ ACRE	STANDARD DEVIATION	SAMPLE* SIZE
Herbaceous	714.19	479.36	400(80)
Woody Spp.	109.03	238.93	400(80)
TOTAL	823.23	532.41	400(80)

* Number in parentheses show total clipped-and-weighed samples.

TABLE 19: Summary of total cover, composition and cover by species for the reference area of the Gordon Creek 3 & 6 Mines (see Sample Map).

A.

TOTAL COVER	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE
Living Cover	47.00	9.27	30
Litter	7.67	2.49	30
Bareground	19.33	7.39	30
Rock	26.00	9.61	30

B.

COMPOSITION	PERCENT	STANDARD DEVIATION	SAMPLE SIZE
Shrubs	48.57	15.85	30
Forbs	10.67	10.30	30
Grasses	40.75	16.56	30

C.

COVER BY SPECIES	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE	RELATIVE FREQUENCY
Trees & Shrubs				
Artemisia frigida	12.03	8.32	30	87.67
Cercocarpus montanus	2.83	7.15	30	16.67
Chrysothamnus depressus	0.50	1.50	30	10.00
Chrysothamnus viscidiflorus	0.33	1.25	30	6.67
Eriogonum corymbosum	2.83	6.15	30	13.33
Gutierrezia sarothrae	1.17	2.11	30	23.33
Pinus edulis	0.83	4.49	30	6.67
Purshia tridentata	1.83	7.58	30	6.67
Tetradymia spinosa	0.33	1.25	30	6.67
Forbs				
Astragalus mollissimus	0.67	1.70	30	13.33
Hedysarum boreale	3.23	3.89	30	50.00
Machaeranthera grindelioides	0.83	1.75	30	20.00
Petradoria pumila	0.07	0.36	30	3.33
Grasses				
Elymus salinus	18.67	10.08	30	100.00
Stipa hymenoides	0.83	2.27	30	13.33

TABLE 20: Summary for woody species density and annual production for the reference area of the Gordon Creek 3 & 6 Mines (combined, see Sample Map).

A.

WOODY SPECIES DENSITY	NUMBER/ACRE
Amelanchier utahensis	5.81
Artemisia frigida	6481.73
Artemisia tridentata	17.42
Cercocarpus montanus	255.55
Chrysothamnus depressus	11.62
Chrysothamnus nauseosus	5.81
Chrysothamnus viscidiflorus	11.62
Eriogonum corymbosum	249.74
Gutierrezia sarothrae	139.39
Pinus edulis	11.62
Purshia tridentata	40.66
Symphoricarpos oreophilus	5.81
Tetradymia spinosa	81.31
TOTAL	7318.08

B.

ANNUAL PRODUCTION

LIFEFORM	LBS/ ACRE	STANDARD DEVIATION	SAMPLE* SIZE
Herbaceous	281.31	285.51	150(30)
Woody Spp.	84.57	83.68	150(30)
TOTAL	365.88	298.74	150(30)

* Number in parentheses show total clipped-and-weighed samples.

TABLE 21: Statistical summary sheet for the reclaimed areas and reference areas at Gordon Creek No. 3 & 6 Mines.

RECLAIMED AREAS (A-E Combined)			
Living Cover	x=59.50	s=10.62	n=80
Density	x=1801.21	s=1233.28	n=80
Production	x=823.23	s=532.41	n=400(80)
REFERENCE AREA			
Living Cover	x=47.00	s=9.27	n=30
Density	x=7818.06	s=1426.93	n=30
Production	x=365.88	s=298.74	n=150(30)
PREDETERMINED SUCCESS STANDARDS			
Living Cover	x=37.00	s= --	n= --
Density	x=1000.00	s= --	n= --
Production	x=640.00	s= --	n= --
STATISTICAL ANALYSES (reclaimed areas vs. reference area)			
Cover	t=5.683	df=108	SL=p<.001
Density	t=-21.818	df=108	SL=p<.001
Production	t=4.442	df=108	SL=p<.001

x = sample mean, s = sample standard deviation,
n = sample size, NS = nonsignificant, t =Student t-value,
df = degrees of freedom, SL = significance level
p = probability level of significance

COLOR PHOTOGRAPHS

Reclaimed Area "A"

Reclaimed Area "B"

Reclaimed Area "C"

Reclaimed Area "D"

Reclaimed Area "E"

Reclaimed Area "F"

Reclaimed Area "G"

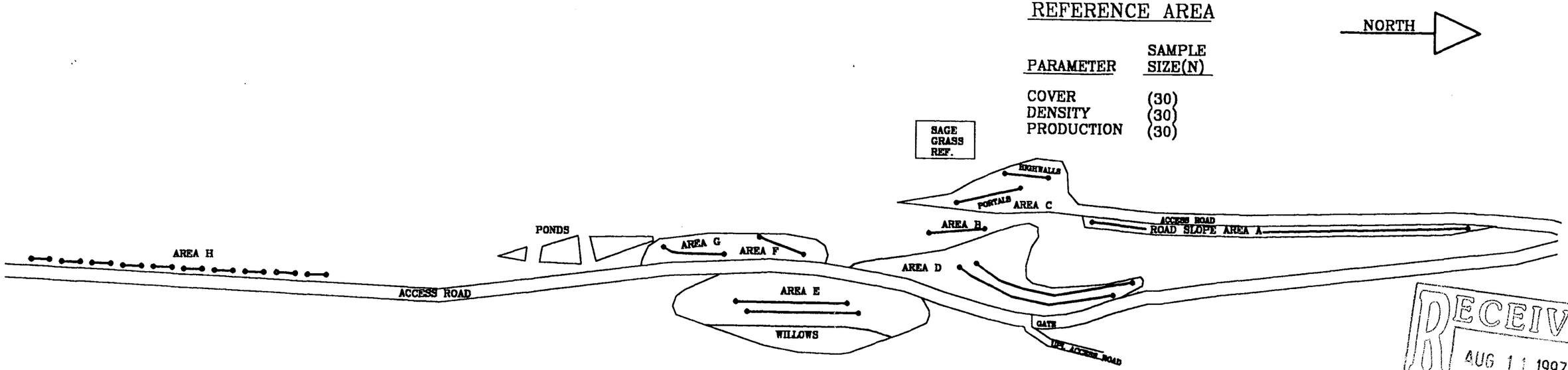
Reclaimed Area "H"

Reference Area

SAMPLE MAP

REFERENCE AREA

PARAMETER	SAMPLE SIZE(N)
COVER	(30)
DENSITY	(30)
PRODUCTION	(30)



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SAMPLE AREA	PARAMETER	SAMPLE SIZE(N)
A–H	COVER	(80)
	DENSITY	(80)
	PRODUCTION	(80{400})

SAMPLE AREA	PARAMETER	SAMPLE SIZE(N)
A	COVER	(10)
	DENSITY	(8)
	PRODUCTION	(10)
B	COVER	(10)
	DENSITY	(8)
	PRODUCTION	(10)
C	COVER	(10)
	DENSITY	(10)
	PRODUCTION	(10)
D	COVER	(10)
	DENSITY	(12)
	PRODUCTION	(10)
E	COVER	(10)
	DENSITY	(10)
	PRODUCTION	(10)

SAMPLE AREA	PARAMETER	SAMPLE SIZE(N)
F	COVER	(10)
	DENSITY	(10)
	PRODUCTION	(10)
G	COVER	(10)
	DENSITY	(10)
	PRODUCTION	(10)
H	COVER	(10)
	DENSITY	(12)
	PRODUCTION	(10)

TRANSECT LINES •—•

GORDON CREEK NO. 3&6
SAMPLE LOCATION MAP
1996

MT. NEBO SCIENTIFIC
RESEARCH AND CONSULTING

DRAWN	S. ROWLEY
CHECKED	P. COLLINS
DATE	6/25/97
SCALE	NOT TO SCALE

GC36.DWG

APPENDIX A:

RAW DATA

BLACKHAWK
Gordon Creek 3 & 6
Reclaimed Mine Site
Area "A" - Road Slope
Exposure: E
Slope: Var.
Sample Date: 24 June 1996

	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00
TREES & SHRUBS								
FORBS								
Aster foliaceus	5.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00
Cynoglossum officinale	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Machaeranthera canescens	0.00	0.00	0.00	0.00	15.00	0.00	0.00	0.00
GRASSES								
Poa pratensis	0.00	0.00	0.00	0.00	0.00	5.00	0.00	0.00
Elymus lanceolatus	0.00	10.00	0.00	10.00	30.00	0.00	0.00	0.00
Elymus cinereus	65.00	40.00	55.00	45.00	5.00	45.00	15.00	60.00
Elymus spicatus	0.00	0.00	15.00	10.00	0.00	10.00	30.00	15.00
Bromus carinatus	0.00	0.00	0.00	0.00	0.00	0.00	5.00	0.00
COVER								
Total Living Cover	75.00	60.00	70.00	65.00	50.00	60.00	50.00	75.00
Litter	10.00	10.00	10.00	10.00	10.00	15.00	20.00	20.00
Bareground	5.00	10.00	5.00	15.00	20.00	5.00	20.00	2.00
Rock	10.00	20.00	15.00	10.00	20.00	20.00	10.00	3.00
% COMPOSITION								
Shrubs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Forbs	13.33	16.67	0.00	0.00	30.00	0.00	0.00	0.00
Grasses	86.67	83.33	100.00	100.00	70.00	100.00	100.00	100.00

BLACKHAWK
Gordon Creek 3 & 6
Reclaimed Mine Site
Area "A" - Road Slope
Exposure: E
Slope: Var.
Sample Date: 24 June 1996

9.00	10.00	Mean	SDev	Freq	
					TREES & SHRUBS
					FORBS
0.00	0.00	1.50	3.20	20.00	*Aster foliaceus*
0.00	0.00	0.50	1.50	10.00	*Cynoglossum officinale*
0.00	0.00	1.50	4.50	10.00	*Machaeranthera canescens*
					GRASSES
0.00	0.00	0.50	1.50	10.00	*Poa pratensis*
0.00	35.00	8.50	12.66	30.00	*Elymus lanceolatus*
40.00	0.00	37.00	21.59	90.00	*Elymus cinereus*
25.00	15.00	12.00	9.80	70.00	*Elymus spicatus*
0.00	0.00	0.50	1.50	10.00	*Bromus carinatus*
					COVER
65.00	50.00	62.00	9.27		Total Living Cover
30.00	35.00	17.00	8.72		Litter
3.00	10.00	9.50	6.41		Bareground
2.00	5.00	11.50	6.64		Rock
					% COMPOSITION
0.00	0.00	0.00	0.00		Shrubs
0.00	0.00	6.00	9.98		Forbs
100.00	100.00	94.00	9.98		Grasses

BLACKHAWK
Gordon Creek 3 & 6
Reclaimed Mine Site
Area "B" - Pad Slope
Exposure: E
Slope: 39 deg.
Sample Date: 24 June 1996

	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00
TREES & SHRUBS								
Chrysothamnus nauseosus	0.00	0.00	0.00	0.00	0.00	35.00	0.00	0.00
Artemisia tridentata	0.00	0.00	0.00	0.00	0.00	0.00	10.00	25.00
Quercus gambelii	0.00	0.00	0.00	0.00	25.00	0.00	10.00	0.00
Gutierrezia sarothrae	0.00	0.00	0.00	0.00	0.00	5.00	0.00	0.00
Cercocarpus montanus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FORBS								
Cynoglossum officinale	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Melilotus officinalis	10.00	0.00	15.00	0.00	5.00	10.00	5.00	0.00
Epilobium brachycarpum	0.00	0.00	0.00	5.00	5.00	0.00	0.00	0.00
GRASSES								
Bromus tectorum	0.00	0.00	5.00	5.00	0.00	0.00	0.00	0.00
Elymus lanceolatus	0.00	10.00	10.00	0.00	0.00	0.00	0.00	0.00
Elymus cinereus	55.00	30.00	0.00	10.00	10.00	5.00	0.00	0.00
Elymus spicatus	0.00	0.00	10.00	0.00	0.00	0.00	25.00	0.00
Poa pratensis	0.00	0.00	10.00	0.00	0.00	0.00	0.00	0.00
Elymus smithii	0.00	0.00	0.00	20.00	0.00	0.00	0.00	0.00
Elymus salinus	0.00	0.00	0.00	0.00	25.00	0.00	0.00	0.00
Stipa hymenoides	0.00	0.00	0.00	0.00	0.00	0.00	0.00	40.00
COVER								
Total Living Cover	65.00	40.00	50.00	40.00	70.00	55.00	50.00	65.00
Litter	25.00	10.00	10.00	15.00	10.00	5.00	10.00	10.00
Bareground	5.00	10.00	20.00	35.00	5.00	25.00	10.00	15.00
Rock	5.00	40.00	20.00	10.00	15.00	15.00	30.00	10.00
% COMPOSITION								
Shrubs	0.00	0.00	0.00	0.00	35.71	72.73	40.00	38.46
Forbs	15.38	0.00	30.00	12.50	14.29	18.18	10.00	0.00
Grasses	84.62	100.00	70.00	87.50	50.00	9.09	50.00	61.54

BLACKHAWK
Gordon Creek 3 & 6
Reclaimed Mine Site
Area "B" - Pad Slope
Exposure: E
Slope: 39 deg.
Sample Date: 24 June 1996

9.00	10.00	Mean	SDev	Freq	
					TREES & SHRUBS
10.00	0.00	4.50	10.59	20.00	*Chrysothamnus nauseosus*
10.00	0.00	4.50	7.89	30.00	*Artemisia tridentata*
0 00	0.00	3 50	7.76	20.00	*Quercus gambelii*
0.00	0.00	0.50	1.50	10.00	*Gutierrezia sarothrae*
0.00	40.00	4.00	12.00	10.00	*Cercocarpus montanus*
					FORBS
5.00	0.00	0.50	1.50	10.00	*Cynoglossum officinalé*
5.00	5.00	5 50	4.72	70.00	*Melilotus officinalis*
0.00	0.00	1.00	2.00	20.00	*Epilobium brachycarpum*
					GRASSES
0.00	5.00	1.50	2.29	30.00	*Bromus tectorum*
0.00	0.00	2.00	4.00	20.00	*Elymus lanceolatus*
0.00	0.00	11.00	17.15	50.00	*Elymus cinereus*
0.00	15.00	5.00	8.37	30.00	*Elymus spicatus*
0.00	0.00	1.00	3.00	10.00	*Poa pratensis*
25.00	0.00	4.50	9.07	20.00	*Elymus smithii*
0.00	0.00	2.50	7.50	10.00	*Elymus salinus*
0.00	0.00	4.00	12.00	10.00	*Stipa hymenoides*
					COVER
55.00	65.00	55.50	10.11		Total Living Cover
10.00	10.00	11.50	5.02		Litter
10 00	15.00	15.00	8.94		Bareground
25 00	10.00	18.00	10.30		Rock
					% COMPOSITION
36.36	61.54	28.48	25.77		Shrubs
18.18	7.69	12.62	8.51		Forbs
45 45	30.77	58.90	26.29		Grasses

BLACKHAWK
Gordon Creek 3 & 6
Reclaimed Mine Site
Area "C" - Portal Pad
Exposure: SE
Slope: 2 deg.
Sample Date: 27 June 1996

	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00
TREES & SHRUBS								
Chrysothamus nauseosus	0.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00
Artemisia tridentata	0.00	0.00	5.00	0.00	0.00	0.00	0.00	0.00
Gutierrezia sarothrae	0.00	0.00	0.00	0.00	10.00	0.00	0.00	0.00
FORBS								
Medicago sativa	0.00	0.00	15.00	0.00	0.00	0.00	0.00	0.00
Melilotus officinalis	5.00	10.00	15.00	30.00	5.00	5.00	10.00	25.00
Aster foliaceus	0.00	0.00	0.00	0.00	10.00	0.00	0.00	0.00
Machaeranthera grindelioide	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GRASSES								
Elymus lanceolatus	0.00	0.00	0.00	0.00	0.00	15.00	0.00	0.00
Elymus cinereus	10.00	10.00	0.00	5.00	15.00	25.00	10.00	5.00
Elymus spicatus	20.00	10.00	15.00	30.00	10.00	20.00	30.00	10.00
Elymus smithii	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00
COVER								
Total Living Cover	40.00	40.00	50.00	65.00	50.00	65.00	50.00	50.00
Litter	20.00	10.00	10.00	20.00	10.00	20.00	10.00	10.00
Bareground	10.00	20.00	25.00	10.00	25.00	10.00	15.00	10.00
Rock	30.00	30.00	15.00	5.00	15.00	5.00	25.00	30.00
% COMPOSITION								
Shrubs	0.00	25.00	10.00	0.00	20.00	0.00	0.00	0.00
Forbs	25.00	25.00	60.00	46.15	30.00	7.69	20.00	50.00
Grasses	75.00	50.00	30.00	53.85	50.00	92.31	80.00	50.00

BLACKHAWK
Gordon Creek 3 & 6
Reclaimed Mine Site
Area "C" - Portal Pad
Exposure: SE
Slope: 2 deg.
Sample Date: 27 June 1996

9.00	10.00	Mean	SDev	Freq	
					TREES & SHRUBS
0.00	0.00	1.00	3.00	10.00	*Chrysothamus nauseosus*
10.00	0.00	1.50	3.20	20.00	*Artemisia tridentata*
0.00	0.00	1.00	3.00	10.00	*Gutierrezia sarothrae*
					FORBS
0.00	0.00	1.50	4.50	10.00	*Medicago sativa*
5.00	5.00	11.50	8.67	100.00	*Melilotus officinalis*
0.00	5.00	1.50	3.20	20.00	*Aster foliaceus*
5.00	0.00	1.00	2.00	20.00	*Machaeranthera grindelioides*
					GRASSES
0.00	0.00	1.50	4.50	10.00	*Elymus lanceolatus*
15.00	15.00	5.00	6.63	90.00	*Elymus cinereus*
10.00	5.00	16.00	8.31	100.00	*Elymus spicatus*
0.00	10.00	2.00	4.00	20.00	*Elymus smithii*
					COVER
45.00	40.00	49.50	8.79		Total Living Cover
10.00	5.00	12.50	5.12		Litter
10.00	25.00	16.00	6.63		Bareground
35.00	30.00	22.00	10.54		Rock
					% COMPOSITION
22.22	0.00	7.72	10.11		Shrubs
22.22	25.00	31.11	15.11		Forbs
55.56	75.00	61.17	17.71		Grasses

BLACKHAWK
Gordon Creek 3 & 6
Reclaimed Mine Site
Area "D"
Exposure: SE E
Slope: 5 - 30 deg.
Sample Date: 26 June 1996

	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00
TREES & SHRUBS								
Chrysothamnus nauseosus	10.00	0.00	10.00	0.00	10.00	10.00	0.00	20.00
Kochia prostrata	0.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00
Artemisia tridentata	0.00	0.00	10.00	0.00	0.00	0.00	0.00	0.00
FORBS								
Hedysarum boreale	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Aster foliaceus	0.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00
Melilotus officinalis	40.00	10.00	15.00	5.00	10.00	10.00	45.00	40.00
GRASSES								
Elymus lanceolatus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Elymus cinerus	0.00	0.00	0.00	40.00	20.00	5.00	0.00	0.00
Elymus spicatus	0.00	0.00	0.00	30.00	10.00	0.00	10.00	5.00
Poa pratensis	0.00	5.00	0.00	0.00	25.00	0.00	0.00	0.00
Elymus salinus	15.00	0.00	10.00	0.00	0.00	35.00	10.00	10.00
Dactylis glomeratus	0.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00
Elymus smithii	0.00	0.00	5.00	0.00	0.00	0.00	0.00	0.00
COVER								
Total Living Cover	70.00	45.00	50.00	75.00	75.00	60.00	65.00	75.00
Litter	5.00	5.00	5.00	15.00	10.00	10.00	10.00	5.00
Bareground	5.00	20.00	5.00	5.00	10.00	15.00	5.00	5.00
Rock	20.00	30.00	40.00	5.00	5.00	15.00	20.00	15.00
% COMPOSITION								
Shrubs	14.29	22.22	40.00	0.00	13.33	16.67	0.00	26.67
Forbs	64.29	44.44	30.00	6.67	13.33	16.67	69.23	53.33
Grasses	21.43	33.33	30.00	93.33	73.33	66.67	30.77	20.00

BLACKHAWK
Gordon Creek 3 & 6
Reclaimed Mine Site
Area "D"
Exposure: SE E
Slope: 5 - 30 deg.
Sample Date: 26 June 1996

9.00	10.00	Mean	SDev	Freq	
					TREES & SHRUBS
0.00	0.00	6.00	6.63	50.00	*Chrysothamnus nauseosus*
0.00	0.00	1.00	3.00	10.00	*Kochia prostrata*
0.00	20.00	3.00	6.40	20.00	*Artemisia tridentata*
					FORBS
0.00	0.00	0.50	1.50	10.00	*Hedysarum boreale*
0.00	0.00	1.00	3.00	10.00	*Aster foliaceus*
25.00	25.00	22.50	14.01	100.00	*Melilotus officinalis*
					GRASSES
25.00	0.00	2.50	7.50	10.00	*Elymus lanceolatus*
0.00	5.00	7.00	12.49	40.00	*Elymus cinerus*
0.00	10.00	6.50	8.96	50.00	*Elymus spicatus*
0.00	0.00	3.00	7.48	20.00	*Poa pratensis*
0.00	0.00	8.00	10.54	50.00	*Elymus salinus*
0.00	0.00	1.00	3.00	10.00	*Dactylis glomeratus*
0.00	0.00	0.50	1.50	10.00	*Elymus smithii*
					COVER
50.00	60.00	62.50	10.78		Total Living Cover
5.00	10.00	8.00	3.32		Litter
10.00	10.00	9.00	4.90		Bareground
35.00	20.00	20.50	11.06		Rock
					% COMPOSITION
0.00	33.33	16.65	13.43		Shrubs
50.00	41.67	38.96	20.50		Forbs
50.00	25.00	44.39	24.03		Grasses

BLACKHAWK
Gordon Creek 3 & 6
Reclaimed Mine Site
Area "E"
Exposure: E
Slope: 2 deg
Sample Date: 26 June 1996

	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00
TREES & SHRUBS								
Chrysothamus nauseosus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00
Kochia prostrata	0.00	5.00	0.00	5.00	20.00	30.00	0.00	15.00
Artemisia nova	0.00	0.00	10.00	0.00	0.00	0.00	0.00	0.00
Atriplex canescens	0.00	0.00	0.00	10.00	0.00	0.00	0.00	0.00
FORBS								
Melilotus officinalis	0.00	10.00	0.00	10.00	0.00	0.00	0.00	10.00
GRASSES								
Elymus cinereus	35.00	30.00	55.00	35.00	45.00	40.00	75.00	25.00
Elymus spicatus	35.00	15.00	10.00	15.00	15.00	10.00	0.00	20.00
COVER								
Total Living Cover	70.00	60.00	75.00	75.00	80.00	80.00	75.00	80.00
Litter	10.00	15.00	15.00	15.00	15.00	10.00	20.00	10.00
Bareground	10.00	20.00	5.00	5.00	4.00	5.00	4.00	5.00
Rock	10.00	5.00	5.00	5.00	1.00	5.00	1.00	5.00
% COMPOSITION								
Shrubs	0.00	8.33	13.33	20.00	25.00	37.50	0.00	31.25
Forbs	0.00	16.67	0.00	13.33	0.00	0.00	0.00	12.50
Grasses	100.00	75.00	86.67	66.67	75.00	62.50	100.00	56.25

BLACKHAWK
Gordon Creek 3 & 6
Reclaimed Mine Site
Area "E"
Exposure: E
Slope: 2 deg
Sample Date: 26 June 1996

9.00	10.00	Mean	SDev	Freq	
					TREES & SHRUBS
0.00	20.00	3.00	6.40	20.00	*Chrysothamus nauseosus*
0.00	0.00	7.50	10.06	50.00	*Kochia prostrata*
0.00	0.00	1.00	3.00	10.00	*Artemisia nova*
0.00	0.00	1.00	3.00	10.00	*Atriplex canescens*
					FORBS
10.00	10.00	5.00	5.00	50.00	*Melilotus officinalis*
					GRASSES
25.00	10.00	37.50	17.07	100.00	*Elymus cinereus*
25.00	25.00	17.00	9.27	90.00	*Elymus spicatus*
					COVER
60.00	65.00	72.00	7.48		Total Living Cover
15.00	10.00	13.50	3.20		Litter
5.00	5.00	6.80	4.69		Bareground
20.00	20.00	7.70	6.59		Rock
					% COMPOSITION
0.00	30.77	16.62	13.56		Shrubs
16.67	15.38	7.46	7.55		Forbs
83.33	53.85	75.93	15.72		Grasses

BLACKHAWK
Gordon Creek 3 & 6
Reclaimed Mine Site
Area "F"
Exposure: E
Slope: 2 - 5 deg
Sample Date: 26 June 1996

	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00
TREES & SHRUBS								
Artemisia tridentata	25.00	0.00	0.00	10.00	10.00	0.00	15.00	15.00
Chrysothamnus nauseosus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	15.00
Kochia prostrata	0.00	0.00	0.00	0.00	0.00	0.00	15.00	0.00
FORBS								
Machaeranthera canescens	0.00	0.00	5.00	0.00	0.00	5.00	0.00	0.00
Melilotus officinalis	10.00	35.00	20.00	30.00	15.00	15.00	0.00	5.00
Machaeranthera grindelioide	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00
GRASSES								
Elymus smithii	0.00	0.00	0.00	10.00	0.00	0.00	0.00	0.00
Elymus lanceolatus	0.00	5.00	5.00	0.00	10.00	0.00	0.00	0.00
Elymus cinereus	10.00	10.00	0.00	0.00	0.00	30.00	10.00	5.00
Elymus spicatus	0.00	0.00	25.00	0.00	10.00	15.00	15.00	25.00
Poa secunda	15.00	10.00	0.00	5.00	0.00	0.00	5.00	0.00
COVER								
Total Living Cover	60.00	60.00	55.00	55.00	45.00	65.00	60.00	70.00
Litter	5.00	10.00	5.00	5.00	5.00	10.00	10.00	5.00
Bareground	15.00	20.00	15.00	30.00	25.00	15.00	15.00	15.00
Rock	20.00	10.00	25.00	10.00	25.00	10.00	15.00	10.00
% COMPOSITION								
Shrubs	41.67	0.00	0.00	18.18	22.22	0.00	50.00	42.86
Forbs	16.67	58.33	45.45	54.55	33.33	30.77	0.00	14.29
Grasses	41.67	41.67	54.55	27.27	44.44	69.23	50.00	42.86

BLACKHAWK
Gordon Creek 3 & 6
Reclaimed Mine Site
Area "F"
Exposure: E
Slope: 2 - 5 deg
Sample Date: 26 June 1996

9.00	10.00	Mean	SDev	Freq	
					TREES & SHRUBS
10.00	0.00	8.50	8.08	60.00	*Artemisia tridentata*
0.00	0.00	1.50	4.50	10.00	*Chrysothamnus nauseosus*
0.00	0.00	1.50	4.50	10.00	*Kochia prostrata*
					FORBS
0.00	0.00	1.00	2.00	20.00	*Machaeranthera canescens*
5.00	10.00	14.50	10.59	90.00	*Melilotus officinalis*
0.00	0.00	0.50	1.50	10.00	*Machaeranthera grindelioides*
					GRASSES
0.00	0.00	1.00	3.00	10.00	*Elymus smithii*
0.00	0.00	2.00	3.32	30.00	*Elymus lanceolatus*
5.00	10.00	8.00	8.43	70.00	*Elymus cinereus*
40.00	10.00	14.00	12.41	70.00	*Elymus spicatus*
0.00	15.00	5.00	5.92	50.00	*Poa secunda*
					COVER
60.00	45.00	57.50	7.50		Total Living Cover
10.00	10.00	7.50	2.50		Litter
15.00	20.00	18.50	5.02		Bareground
15.00	25.00	16.50	6.34		Rock
					% COMPOSITION
16.67	0.00	19.16	18.72		Shrubs
8.33	22.22	28.39	18.67		Forbs
75.00	77.78	52.45	15.70		Grasses

BLACKHAWK
Gordon Creek 3 & 6
Reclaimed Mine Site
Area "G"
Exposure: E
Slope: 5 deg
Sample Date: 27 June 1996

	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00
TREES & SHRUBS								
Ceratoides lanata	0.00	0.00	5.00	0.00	5.00	0.00	0.00	0.00
Kochia prostrata	0.00	0.00	0.00	20.00	0.00	0.00	0.00	0.00
Gutierrezia sarothae	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FORBS								
Melilotus officinalis	0.00	5.00	5.00	5.00	10.00	5.00	10.00	5.00
GRASSES								
Poa secunda	0.00	0.00	0.00	5.00	0.00	0.00	0.00	0.00
Elymus lanceolatus	0.00	0.00	0.00	15.00	0.00	10.00	10.00	0.00
Elymus cinereus	35.00	5.00	35.00	5.00	10.00	15.00	30.00	40.00
Elymus spicatus	0.00	20.00	15.00	0.00	0.00	0.00	0.00	0.00
Elymus salinus	25.00	20.00	0.00	0.00	30.00	30.00	0.00	20.00
COVER								
Total Living Cover	60.00	50.00	60.00	50.00	55.00	60.00	50.00	65.00
Litter	5.00	10.00	10.00	10.00	15.00	5.00	20.00	10.00
Bareground	15.00	15.00	20.00	15.00	5.00	15.00	10.00	15.00
Rock	20.00	25.00	10.00	25.00	25.00	20.00	20.00	10.00
% COMPOSITION								
Shrubs	0.00	0.00	8.33	40.00	9.09	0.00	0.00	0.00
Forbs	0.00	10.00	8.33	10.00	18.18	8.33	20.00	7.69
Grasses	100.00	90.00	83.33	50.00	72.73	91.67	80.00	92.31

BLACKHAWK
Gordon Creek 3 & 6
Reclaimed Mine Site
Area "G"
Exposure: E
Slope: 5 deg
Sample Date: 27 June 1996

9.00	10.00	Mean	SDev	Freq	
					TREES & SHRUBS
0.00	0.00	1.00	2.00	20.00	*Ceratoides lanata*
0.00	0.00	2.00	6.00	10.00	*Kochia prostrata*
0.00	10.00	1.00	3.00	10.00	*Gutierrezia sarothae*
					FORBS
20.00	10.00	7.50	5.12	90.00	*Melilotus officinalis*
					GRASSES
0.00	55.00	6.00	16.40	20.00	*Poa secunda*
15.00	0.00	5.00	6.32	40.00	*Elymus lanceolatus*
20.00	0.00	19.50	13.87	90.00	*Elymus cinereus*
0.00	0.00	3.50	7.09	20.00	*Elymus spicatus*
0.00	0.00	12.50	12.89	50.00	*Elymus salinus*
					COVER
55.00	75.00	58.00	7.48		Total Living Cover
10.00	10.00	10.50	4.15		Litter
10.00	5.00	12.50	4.61		Bareground
25.00	10.00	19.00	6.24		Rock
					% COMPOSITION
0.00	13.33	7.08	11.95		Shrubs
36.36	13.33	13.22	9.38		Forbs
63.64	73.33	79.70	14.36		Grasses

BLACKHAWK
Gordon Creek 3 & 6
Reclaimed Mine Site
Area "H"
Exposure: E
Slope:

Sample Date: 27 June 1996	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00
TREES & SHRUBS								
Chrysothamus nauseosus	0.00	20.00	0.00	0.00	40.00	10.00	10.00	0.00
Artemisia tridentata	0.00	15.00	15.00	20.00	15.00	5.00	10.00	15.00
Kochia protrata	0.00	0.00	0.00	0.00	0.00	10.00	25.00	0.00
FORBS								
Sphaeralcea grossulariaefoli	5.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00
Machaeranthera grindelioide	0.00	5.00	5.00	0.00	0.00	0.00	0.00	0.00
Melilotus officinalis	0.00	0.00	0.00	10.00	5.00	0.00	0.00	0.00
GRASSES								
Elymus spicatus	0.00	5.00	0.00	5.00	0.00	0.00	0.00	0.00
Elymus lanceolatus	20.00	0.00	0.00	0.00	0.00	25.00	5.00	0.00
Elymus cinereus	25.00	0.00	20.00	5.00	0.00	0.00	10.00	10.00
Poa pratensis	10.00	15.00	0.00	5.00	0.00	0.00	0.00	0.00
Poa secunda	0.00	0.00	10.00	5.00	10.00	0.00	5.00	25.00
COVER								
Total Living Cover	60.00	65.00	50.00	50.00	70.00	50.00	65.00	50.00
Litter	5.00	5.00	5.00	10.00	10.00	5.00	5.00	5.00
Bareground	15.00	10.00	25.00	25.00	10.00	35.00	10.00	30.00
Rock	20.00	20.00	20.00	15.00	10.00	10.00	20.00	15.00
% COMPOSITION								
Shrubs	0.00	53.85	30.00	40.00	78.57	50.00	69.23	30.00
Forbs	8.33	15.38	10.00	20.00	7.14	0.00	0.00	0.00
Grasses	91.67	30.77	60.00	40.00	14.29	50.00	30.77	70.00

BLACKHAWK
Gordon Creek 3 & 6
Reclaimed Mine Site
Area "H"
Exposure: E
Slope:
Sample Date: 27 June 1996

9.00	10.00	Mean	SDev	Freq	
					TREES & SHRUBS
0.00	0.00	8.00	12.49	40.00	*Chrysothamus nauseosus*
0.00	0.00	9.50	7.23	70.00	*Artemisia tridentata*
0.00	0.00	3.50	7.76	20.00	*Kochia protrata*
					FORBS
0.00	0.00	1.00	2.00	20.00	*Sphaeralcea grossulariaefolia*
0.00	0.00	1.00	2.00	20.00	*Machaeranthera grindelioides*
0.00	0.00	1.50	3.20	20.00	*Melilotus officinalis*
					GRASSES
0.00	5.00	1.50	2.29	20.00	*Elymus spicatus*
10.00	0.00	6.00	8.89	40.00	*Elymus lanceolatus*
35.00	40.00	14.50	14.04	60.00	*Elymus cinereus*
10.00	0.00	4.00	5.39	50.00	*Poa pratensis*
10.00	20.00	8.50	8.08	70.00	*Poa secunda*
					COVER
65.00	65.00	59.00	7.68		Total Living Cover
5.00	5.00	6.00	2.00		Litter
25.00	20.00	20.50	8.50		Bareground
5.00	10.00	14.50	5.22		Rock
					% COMPOSITION
0.00	0.00	35.16	27.20		Shrubs
0.00	0.00	6.09	6.98		Forbs
100.00	100.00	58.75	29.30		Grasses

BLACKHAWK
Gordon Creek 3 & 6
Reference Area Sagebrush/Grass
Exposure: E
Slope: 36 deg.

Sample Date: 27 June 1996	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00
TREES & SHRUBS								
Tetradymia spinosa	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pinus edulis	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Chrysothamnus depressa	5.00	0.00	0.00	0.00	0.00	5.00	0.00	5.00
Gutierrezia sarothrae	5.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00
Artemisia frigida	5.00	5.00	10.00	25.00	0.00	10.00	15.00	15.00
Eriogonum corymbosum	10.00	10.00	10.00	0.00	25.00	0.00	5.00	0.00
Cercocarpus montanus	0.00	0.00	0.00	0.00	0.00	10.00	0.00	0.00
Purshia tridentata	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Chrysothamnus viscidiflorus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FORBS								
Petradoria pumila	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hedysarum boreale	5.00	5.00	10.00	5.00	0.00	0.00	10.00	0.00
Astralagus mollissimus	0.00	0.00	0.00	5.00	5.00	5.00	0.00	0.00
Machaeranthera grindelioide	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00
GRASSES								
Stipa hymenoides	0.00	0.00	10.00	0.00	5.00	0.00	0.00	5.00
Elymus salinus	25.00	10.00	5.00	15.00	20.00	10.00	30.00	10.00
COVER								
Total Living Cover	55.00	35.00	45.00	50.00	55.00	40.00	60.00	40.00
Litter	10.00	5.00	5.00	5.00	10.00	5.00	5.00	5.00
Bareground	20.00	25.00	20.00	20.00	20.00	20.00	10.00	15.00
Rock	15.00	35.00	30.00	25.00	15.00	35.00	25.00	40.00
% COMPOSITION								
Shrubs	45.45	57.14	44.44	50.00	45.45	62.50	33.33	50.00
Forbs	9.09	14.29	22.22	20.00	9.09	12.50	16.67	12.50
Grasses	45.45	28.57	33.33	30.00	45.45	25.00	50.00	37.50

9.00	10.00	11.00	12.00	13.00	14.00	15.00	16.00	17.00	18.00	19.00
0.00	0.00	5.00	0.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00
25.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5.00	0.00	15.00	10.00	0.00	5.00	30.00	10.00	30.00	18.00	15.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	20.00	0.00	0.00	0.00
0.00	0.00	0.00	5.00	0.00	25.00	0.00	0.00	0.00	0.00	0.00
0.00	15.00	0.00	0.00	40.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	5.00	0.00	0.00	0.00	0.00	5.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00
0.00	0.00	5.00	5.00	0.00	0.00	10.00	0.00	0.00	0.00	10.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5.00	50.00	20.00	20.00	25.00	20.00	10.00	15.00	10.00	10.00	20.00
35.00	65.00	50.00	40.00	70.00	50.00	50.00	50.00	40.00	35.00	45.00
5.00	10.00	5.00	5.00	10.00	5.00	10.00	10.00	10.00	10.00	10.00
35.00	15.00	15.00	10.00	5.00	20.00	20.00	10.00	15.00	25.00	30.00
25.00	10.00	30.00	45.00	15.00	25.00	20.00	30.00	35.00	30.00	15.00
85.71	23.08	50.00	37.50	64.29	60.00	60.00	70.00	75.00	51.43	33.33
0.00	0.00	10.00	12.50	0.00	0.00	20.00	0.00	0.00	20.00	22.22
14.29	76.92	40.00	50.00	35.71	40.00	20.00	30.00	25.00	28.57	44.44

20.00	21.00	22.00	23.00	24.00	25.00	26.00	27.00	28.00	29.00	30.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	5.00	5.00	5.00	0.00	0.00	5.00	0.00	5.00
10.00	0.00	25.00	10.00	5.00	10.00	10.00	20.00	20.00	18.00	10.00
0.00	0.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	25.00	0.00	0.00	0.00	0.00	0.00	20.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10.00	10.00	5.00	2.00	0.00	0.00	0.00	3.00	0.00	2.00	0.00
5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	5.00	0.00	3.00	0.00	0.00	5.00	2.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	5.00	0.00	0.00	0.00	0.00	0.00
10.00	10.00	10.00	30.00	40.00	15.00	25.00	20.00	20.00	20.00	30.00
35.00	50.00	45.00	50.00	50.00	35.00	40.00	65.00	45.00	40.00	45.00
5.00	5.00	10.00	5.00	10.00	5.00	10.00	10.00	10.00	10.00	10.00
20.00	10.00	35.00	15.00	20.00	30.00	10.00	15.00	25.00	25.00	25.00
40.00	35.00	10.00	30.00	20.00	30.00	40.00	10.00	20.00	25.00	20.00
28.57	50.00	66.67	30.00	20.00	42.86	25.00	61.54	55.56	45.00	33.33
42.86	30.00	11.11	10.00	0.00	0.00	12.50	7.69	0.00	5.00	0.00
28.57	20.00	22.22	60.00	80.00	57.14	62.50	30.77	44.44	50.00	66.67

BLACKHAWK
Gordon Creek 3 & 6
Reference Area Sagebrush/Grass
Exposure: E
Slope: 36 deg.
Sample Date: 27 June 1996

Mean	SDev	Freq	
			TREES & SHRUBS
0.33	1.25	6.67	*Tetradymia spinosa*
0.83	4.49	6.67	*Pinus edulis*
0.50	1.50	10.00	*Chrysothamnus depressa*
1.17	2.11	23.33	*Gutierrezia sarothrae*
12.03	8.32	86.67	*Artemisia frigida*
2.83	6.15	13.33	*Eriogonum corymbosum*
2.83	7.15	16.67	*Cercocarpus montanus*
1.83	7.58	6.67	*Purshia tridentata*
0.33	1.25	6.67	*Chrysothamnus viscidiflorus*
			FORBS
0.07	0.36	3.33	*Petradoria pumila*
3.23	3.89	50.00	*Hedysarum boreale*
0.67	1.70	13.33	*Astralagus mollissimus*
0.83	1.75	20.00	*Machaeranthera grindelioides*
			GRASSES
0.83	2.27	13.33	*Stipa hymenoides*
18.67	10.08	100.00	*Elymus salinus*
			COVER
47.00	9.27		Total Living Cover
7.67	2.49		Litter
19.33	7.39		Bareground
26.00	9.61		Rock
			% COMPOSITION
48.57	15.85		Shrubs
10.67	10.30		Forbs
40.75	16.56		Grasses

BLACKHAWK
Gordon Creek 3 & 6
Reclaimed Mine Site
Area "A" thru "H" Combined
Exposure: Area A = 1 thru 10
Slope:

Sample Date: 27 June 1996	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00
TREES & SHRUBS								
Artemisia tridentata	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Chrysothamnus nauseosus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Quercus gambelii	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gutierrezia sarothrae	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cercocarpus montanus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Kochia prostrata	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Artemisia nova	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Atriplex canescens	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ceratoides lanata	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FORBS								
Aster foliaceus	5.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00
Cynoglossum officinale	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Machaeranthera canescens	0.00	0.00	0.00	0.00	15.00	0.00	0.00	0.00
Melilotus officinalis	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Epilobium halleanum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Machaeranthera grindelioide	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Medicago sativa	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hedysarum boreale	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sphaeralcea grossulariaefoli	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GRASSES								
Poa pratensis	0.00	0.00	0.00	0.00	0.00	5.00	0.00	0.00
Elymus spicatus	0.00	0.00	15.00	10.00	0.00	10.00	30.00	15.00
Elymus cinereus	65.00	40.00	55.00	45.00	5.00	45.00	15.00	60.00
Elymus lanceolatus	0.00	10.00	0.00	10.00	30.00	0.00	0.00	0.00
Bromus carinatus	0.00	0.00	0.00	0.00	0.00	0.00	5.00	0.00
Stipa hymenoides	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Elymus salinus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Elymus smithii	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bromus tectorum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dactylis glomeratus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Poa secunda	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
COVER								
Total Living Cover	75.00	60.00	70.00	65.00	50.00	60.00	50.00	75.00
Litter	10.00	10.00	10.00	10.00	10.00	15.00	20.00	20.00
Bareground	5.00	10.00	5.00	15.00	20.00	5.00	20.00	2.00
Rock	10.00	20.00	15.00	10.00	20.00	20.00	10.00	3.00
% COMPOSITION								
Shrubs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Forbs	13.33	16.67	0.00	0.00	30.00	0.00	0.00	0.00
Grasses	86.67	83.33	100.00	100.00	70.00	100.00	100.00	100.00

Area B = 11 thru 20

9.00	10.00	11.00	12.00	13.00	14.00	15.00	16.00	17.00	18.00	19.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00	25.00	10.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	35.00	0.00	0.00	10.00
0.00	0.00	0.00	0.00	0.00	0.00	25.00	0.00	10.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	10.00	0.00	15.00	0.00	5.00	10.00	5.00	0.00	5.00
0.00	0.00	0.00	0.00	0.00	5.00	5.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00
25.00	15.00	0.00	0.00	10.00	0.00	0.00	0.00	25.00	0.00	0.00
40.00	0.00	55.00	30.00	0.00	10.00	10.00	5.00	0.00	0.00	0.00
0.00	35.00	0.00	10.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	40.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	25.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	20.00	0.00	0.00	0.00	0.00	25.00
0.00	0.00	0.00	0.00	5.00	5.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
65.00	50.00	65.00	40.00	50.00	40.00	70.00	55.00	50.00	65.00	55.00
30.00	35.00	25.00	10.00	10.00	15.00	10.00	5.00	10.00	10.00	10.00
3.00	10.00	5.00	10.00	20.00	35.00	5.00	25.00	10.00	15.00	10.00
2.00	5.00	5.00	40.00	20.00	10.00	15.00	15.00	30.00	10.00	25.00
0.00	0.00	0.00	0.00	0.00	0.00	35.71	72.73	40.00	38.46	36.36
0.00	0.00	15.38	0.00	30.00	12.50	14.29	18.18	10.00	0.00	18.18
100.00	100.00	84.62	100.00	70.00	87.50	50.00	9.09	50.00	61.54	45.45

Area C = 21 thru 30

20.00	21.00	22.00	23.00	24.00	25.00	26.00	27.00	28.00	29.00	30.00
0.00	0.00	0.00	5.00	0.00	0.00	0.00	0.00	0.00	10.00	0.00
0.00	0.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	10.00	0.00	0.00	0.00	0.00	0.00
40.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	10.00	0.00	0.00	0.00	0.00	5.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5.00	5.00	10.00	15.00	30.00	5.00	5.00	10.00	25.00	5.00	5.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	0.00
0.00	0.00	0.00	15.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15.00	20.00	10.00	15.00	30.00	10.00	20.00	30.00	10.00	10.00	5.00
0.00	10.00	10.00	0.00	5.00	15.00	25.00	10.00	5.00	15.00	15.00
0.00	0.00	0.00	0.00	0.00	0.00	15.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00	0.00	10.00
5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
65.00	40.00	40.00	50.00	65.00	50.00	65.00	50.00	50.00	45.00	40.00
10.00	20.00	10.00	10.00	20.00	10.00	20.00	10.00	10.00	10.00	5.00
15.00	10.00	20.00	25.00	10.00	25.00	10.00	15.00	10.00	10.00	25.00
10.00	30.00	30.00	15.00	5.00	15.00	5.00	25.00	30.00	35.00	30.00
61.54	0.00	25.00	10.00	0.00	20.00	0.00	0.00	0.00	22.22	0.00
7.69	25.00	25.00	60.00	46.15	30.00	7.69	20.00	50.00	22.22	25.00
30.77	75.00	50.00	30.00	53.85	50.00	92.31	80.00	50.00	55.56	75.00

Area D = 31 thru 40

31.00	32.00	33.00	34.00	35.00	36.00	37.00	38.00	39.00	40.00	41.00
0.00	0.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00	20.00	0.00
10.00	0.00	10.00	0.00	10.00	10.00	0.00	20.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
40.00	10.00	15.00	5.00	10.00	10.00	45.00	40.00	25.00	25.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	5.00	0.00	0.00	25.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	30.00	10.00	0.00	10.00	5.00	0.00	10.00	35.00
0.00	0.00	0.00	40.00	20.00	5.00	0.00	0.00	0.00	5.00	35.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	25.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15.00	0.00	10.00	0.00	0.00	35.00	10.00	10.00	0.00	0.00	0.00
0.00	0.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
70.00	45.00	50.00	75.00	75.00	60.00	65.00	75.00	50.00	60.00	70.00
5.00	5.00	5.00	15.00	10.00	10.00	10.00	5.00	5.00	10.00	10.00
5.00	20.00	5.00	5.00	10.00	15.00	5.00	5.00	10.00	10.00	10.00
20.00	30.00	40.00	5.00	5.00	15.00	20.00	15.00	35.00	20.00	10.00
14.29	22.22	40.00	0.00	13.33	16.67	0.00	26.67	0.00	33.33	0.00
64.29	44.44	30.00	6.67	13.33	16.67	69.23	53.33	50.00	41.67	0.00
21.43	33.33	30.00	93.33	73.33	66.67	30.77	20.00	50.00	25.00	100.00

Area E = 41 thru 50

42.00	43.00	44.00	45.00	46.00	47.00	48.00	49.00	50.00	51.00	52.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	25.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	10.00	0.00	20.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5.00	0.00	5.00	20.00	30.00	0.00	15.00	0.00	0.00	0.00	0.00
0.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10.00	0.00	10.00	0.00	0.00	0.00	10.00	10.00	10.00	10.00	35.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15.00	10.00	15.00	15.00	10.00	0.00	20.00	25.00	25.00	0.00	0.00
30.00	55.00	35.00	45.00	40.00	75.00	25.00	25.00	10.00	10.00	10.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	15.00	10.00
60.00	75.00	75.00	80.00	80.00	75.00	80.00	60.00	65.00	60.00	60.00
15.00	15.00	15.00	15.00	10.00	20.00	10.00	15.00	10.00	5.00	10.00
20.00	5.00	5.00	4.00	5.00	4.00	5.00	5.00	5.00	15.00	20.00
5.00	5.00	5.00	1.00	5.00	1.00	5.00	20.00	20.00	20.00	10.00
8.33	13.33	20.00	25.00	37.50	0.00	31.25	0.00	30.77	41.67	0.00
16.67	0.00	13.33	0.00	0.00	0.00	12.50	16.67	15.38	16.67	58.33
75.00	86.67	66.67	75.00	62.50	100.00	56.25	83.33	53.85	41.67	41.67

Area F = 51 thru 60

53.00	54.00	55.00	56.00	57.00	58.00	59.00	60.00	61.00	62.00	63.00
0.00	10.00	10.00	0.00	15.00	15.00	10.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	15.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	15.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5.00	0.00	0.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20.00	30.00	15.00	15.00	0.00	5.00	5.00	10.00	0.00	5.00	5.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	5.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25.00	0.00	10.00	15.00	15.00	25.00	40.00	10.00	0.00	20.00	15.00
0.00	0.00	0.00	30.00	10.00	5.00	5.00	10.00	35.00	5.00	35.00
5.00	0.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	25.00	20.00	0.00
0.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	5.00	0.00	0.00	5.00	0.00	0.00	15.00	0.00	0.00	0.00
55.00	55.00	45.00	65.00	60.00	70.00	60.00	45.00	60.00	50.00	60.00
5.00	5.00	5.00	10.00	10.00	5.00	10.00	10.00	5.00	10.00	10.00
15.00	30.00	25.00	15.00	15.00	15.00	15.00	20.00	15.00	15.00	20.00
25.00	10.00	25.00	10.00	15.00	10.00	15.00	25.00	20.00	25.00	10.00
0.00	18.18	22.22	0.00	50.00	42.86	16.67	0.00	0.00	0.00	8.33
45.45	54.55	33.33	30.77	0.00	14.29	8.33	22.22	0.00	10.00	8.33
54.55	27.27	44.44	69.23	50.00	42.86	75.00	77.78	100.00	90.00	83.33

Area G = 61 thru 70

64.00	65.00	66.00	67.00	68.00	69.00	70.00	71.00	72.00	73.00	74.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	15.00	15.00	20.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	20.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	10.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5.00	10.00	5.00	10.00	5.00	20.00	10.00	0.00	0.00	0.00	10.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	5.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	5.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00	15.00	0.00	5.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	0.00	5.00
5.00	10.00	15.00	30.00	40.00	20.00	0.00	25.00	0.00	20.00	5.00
15.00	0.00	10.00	10.00	0.00	15.00	0.00	20.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	30.00	30.00	0.00	20.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5.00	0.00	0.00	0.00	0.00	0.00	55.00	0.00	0.00	10.00	5.00
50.00	55.00	60.00	50.00	65.00	55.00	75.00	60.00	65.00	50.00	50.00
10.00	15.00	5.00	20.00	10.00	10.00	10.00	5.00	5.00	5.00	10.00
15.00	5.00	15.00	10.00	15.00	10.00	5.00	15.00	10.00	25.00	25.00
25.00	25.00	20.00	20.00	10.00	25.00	10.00	20.00	20.00	20.00	15.00
40.00	9.09	0.00	0.00	0.00	0.00	13.33	0.00	53.85	30.00	40.00
10.00	18.18	8.33	20.00	7.69	36.36	13.33	8.33	15.38	10.00	20.00
50.00	72.73	91.67	80.00	92.31	63.64	73.33	91.67	30.77	60.00	40.00

Area G = 70 thru 80

75.00	76.00	77.00	78.00	79.00	80.00
15.00	5.00	10.00	15.00	0.00	0.00
40.00	10.00	10.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00
0.00	10.00	25.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00
5.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	10.00	0.00
0.00	0.00	0.00	0.00	0.00	5.00
0.00	0.00	10.00	10.00	35.00	40.00
0.00	25.00	5.00	0.00	10.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00
10.00	0.00	5.00	25.00	10.00	20.00
70.00	50.00	65.00	50.00	65.00	65.00
10.00	5.00	5.00	5.00	5.00	5.00
10.00	35.00	10.00	30.00	25.00	20.00
10.00	10.00	20.00	15.00	5.00	10.00
78.57	50.00	69.23	30.00	0.00	0.00
7.14	0.00	0.00	0.00	0.00	0.00
14.29	50.00	30.77	70.00	100.00	100.00

BLACKHAWK
Gordon Creek 3 & 6
Reclaimed Mine Site
Area "A" thru "H" Combined
Exposure:
Slope:
Sample Date: 27 June 1996

Mean	SDev	Freq	
			TREES & SHRUBS
3.38	6.46	23.75	*Artemisia tridentata*
3.00	7.44	18.75	*Chrysothamnus nauseosus*
0.44	2.98	2.50	*Quercus gambelii*
0.31	1.65	3.75	*Gutierrezia sarothrae*
0.50	4.44	1.25	*Cercocarpus montanus*
1.94	5.84	12.50	*Kochia prostrata*
0.13	1.11	2.50	*Artemisia nova*
0.13	1.11	1.25	*Atriplex canescens*
0.13	0.78	2.50	*Ceratoides lanata*
			FORBS
0.50	2.03	6.25	*Aster foliaceus*
0.06	0.56	2.50	*Cynoglossum officinale*
0.31	1.83	3.75	*Machaeranthera canescens*
8.50	10.32	65.00	*Melilotus officinalis*
0.13	0.78	2.50	*Epilobium halleanum*
0.31	1.21	6.25	*Machaeranthera grindelioides*
0.19	1.67	1.25	*Medicago sativa*
0.06	0.56	1.25	*Hedysarum boreale*
0.13	0.78	2.50	*Sphaeralcea grossulariaefolia*
			GRASSES
1.06	3.77	10.00	*Poa pratensis*
9.44	10.40	60.00	*Elymus spicatus*
18.19	18.66	75.00	*Elymus cinereus*
3.44	7.40	23.75	*Elymus lanceolatus*
0.06	0.56	1.25	*Bromus carinatus*
0.50	4.44	1.25	*Stipa hymenoides*
2.88	7.86	13.75	*Elymus salinus*
1.00	3.98	15.00	*Elymus smithii*
0.19	0.95	3.75	*Bromus tectorum*
0.13	1.11	1.25	*Dactylis glomeratus*
2.44	7.54	17.50	*Poa secunda*
			COVER
59.50	10.62		Total Living Cover
10.81	5.78		Litter
13.48	7.86		Bareground
16.21	9.31		Rock
			% COMPOSITION
16.36	20.31		Shrubs
17.98	17.79		Forbs
65.66	25.22		Grasses

VEGETATION MONITORING: RECLAIMED AREAS OF THE GORDON CREEK NO. 3 & 6 MINES

1995

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VEGETATION MONITORING:

RECLAIMED AREAS OF THE GORDON CREEK NO. 3 & 6 MINES

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SCOPE

The following report has been prepared to assess the current condition of the vegetation of the reclaimed areas at the Gordon Creek No. 3 & 6 Mines. The reclaimed areas were compared with an undisturbed reference area that was used as a standard for revegetation success.

INTRODUCTION

General Site Description

The Gordon Creek No. 3 & 6 Mines are located in the Gordon Creek area of Carbon County, Utah. The elevation of the area lies between 7,550 ft and 7,850 ft above sea level. Vegetation types adjacent to the mine area were oak-shrubland and

sagebrush-grassland communities. The reclaimed areas of the mine site lie on a variety of slopes and exposures which are discussed further in the METHODS section of this report.

Sample History

MT. NEBO SCIENTIFIC has been involved with sampling the area in recent years. In 1989 qualitative and quantitative sampling was conducted on the reclaimed areas of the mine sites. Also surveyed in 1989 was species survival of containerized transplants. Woody plant species density sampling was conducted in 1991, whereas, no vegetation sampling was done in 1992. In 1993 quantitative and qualitative sampling was conducted on the reclaimed areas and comparisons were made with the reference area.

METHODS

Methodologies used herein were performed in accordance with the guidelines supplied by the State of Utah, Division of Oil, Gas and Mining (DOGM). Similar methods were used this year to facilitate data comparisons between other years.

Quantitative and qualitative data were taken on the vegetation of the reclaimed and reference areas. Sampling was

conducted August 21-28, 1995. The reclaimed areas were divided into sample areas (see Sample Map). Each of those areas consisted of several disturbance types (i.e. roads, pads, portals, regraded slopes, etc.).

Transect and Quadrat Placement

Transect lines for sampling were placed randomly throughout the reclaimed areas resulting in several sample sites (see Sample Map).

Random/regular placement of sampling quadrats were designed to decrease bias, yet encompass as much of the area as practical. Once the transect lines were placed, regular points were then marked on them. From these marks, a random number dictated the direction and distance to place the quadrats at right angles from the transect lines.

All reclaimed areas were seeded with the same seed mix on a variety of slopes, exposures, soil conditions, and water relationships, etc. Data summaries are presented separately and combined due to heterogeneity of this area. Reporting the data in this manner was an attempt to provide information of small, localized areas, yet also provide the average success of the entire mine site. The reference area was also sampled using the same methods and reports the data combined.

Cover and Composition

Cover estimates were made using ocular methods with meter square quadrats. Species composition and relative frequencies were also assessed from the quadrats. Additional information recorded on the raw data sheets were: estimated precipitation, slope, exposure, grazing use, animal disturbance and other appropriate notes. Plant nomenclature follows Welsh et al. (1987).

Woody Plant Species Density

Density of woody plant species of the reclaimed and reference areas were made using belt transects. These 5 ft by 50 ft belts were placed randomly throughout the study areas. Total number of individuals by species were counted in each of the belt transects. The average number was then calculated followed by the number of individuals per acre.

Production

Total annual biomass production was estimated by clipping, drying and weighing current annual growth. "Double sampling" using four quadrats estimated around the clipped and weighed plot was implemented.

Sample Adequacy & Statistical Comparisons

Sampling adequacy was attempted using formulas from Snedocor and Cochran (1980), with the goal that 80% of the samples were within 10% of the true mean for the shrub communities of the area. The formula used is given below.

$$nmin = \left[\frac{1.28\ (s)}{x\ (.1)}\right]^2$$

where,

nmin = minimum adequate sample
s = standard deviation
x = sample mean
.1 = confidence interval

Almost without exception, enough samples were taken to achieve sample adequacy for the standard set above. Mention should be made, however, that the very nature of the sample design for this study increases variability in the results for each parameter -- hence, increases sample size. That is, because transect locations in the reclaimed areas were selected often for their *differences* (i.e. exposure, species composition, slope, disturbance types, etc.) and later "lumped" (or combined) with other data to provide *average success of the site as a whole*.

Student's t-tests were also employed to compare the reclaimed and reference areas of all sites for cover and productivity. All sample means, standard deviations, and sample sizes were included in this report to enable the reviewers to

apply further statistical tests if desired.

Photographs

Color photographs of the sample areas were taken at the time of sampling and have been submitted with this report.

Raw Data

The raw data for cover, composition and frequency have been summarized on a spreadsheet and are included in this report in Appendix A.

RESULTS

Reclaimed Areas (Areas A-H, separately)

Vegetation sample areas A-H (see Sample Map) were first summarized separately. Tables 1 through 21 summarize the results of the sampling for these areas. The tables include total cover, lifeform composition, cover by species, species frequency, sample sizes, woody plant species density, and productivity.

Cover of each of the reclaimed areas (A-H, separately) ranged from 45.00% to 61.00%, each statistically greater than or equal to the cover of the Reference Area (Table 21).

Grass was the most important lifeform by *composition* in each of the reclaimed areas by a wide margin. Forbs and woody plant species were nearly equally represented, but forbs were somewhat more important by composition.

Woody plant species *density* of each of the areas when summarized separately ranged from 523 to 5,057 individuals per acre. The standard for the reclaimed areas that was determined previously for woody plant species density was 1,000 individuals per acre. Three of the eight areas fell somewhat below this standard, but as will be shown later, the average was well above that.

Production of each area sampled in the reclaimed areas ranged between 616.24 to 1648.46 lbs. per acre. All of these values were significantly greater than the reference area.

<u>Reclaimed Areas</u> (Areas A-H, combined)

When the data of the reclaimed areas were combined to show the success of the revegetation of the mine site as a whole, the following patterns existed.

Cover of the combined areas was estimated as 50.75% (Table 17-A). Cover for the reference area was 42.83% (Table 19-A). The differences were statistically significant with the reclaimed

area represented by greater cover than the reference area (Table 21).

As one would expect by the results described above for each area separately, grasses were by far the most important lifeform in the combined results, followed distantly by forbs and woody species. Forbs and woody species were nearly equally represented (Tables 17-B). In the reference area, however, woody species dominated the site for composition, followed closely by grasses. Forbs were also an important component of the reference area, but were much less in terms of composition (Table 19-B).

Density of the woody plant species of the combined reclaimed areas was 1,945 individuals per acre (Table 18-A). This value is also greater than the standard of 1,000 individuals per acre previously determined by DOGM and the operator.

Productivity of the combined areas and the reference area was estimated at 1,100.15 (Table 18-B) and 408.09 lbs. per acre (Table 20-B), respectively. These differences were also significant (Table 21).

DISCUSSION

The results and conclusions of this report suggest that the Gordon Creek reclaimed mine site area met or exceeded standards

predetermined for revegetation success. The reclaimed mine site will be sampled again in 1996 using similar methods. Subsequent to the sampling the results will be compared to the data in this report. A more comprehensive document will then be written showing similarities and differences between sample years, standards for reclamation success, and the reference area.

TABLE 1: Summary of total cover, composition and cover by species for the reclaimed areas of the Gordon Creek 3 & 6 Mines (Area "A", see Sample Map).

A.

TOTAL COVER	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE
Living Cover	61.00	9.95	10
Litter	9.00	4.90	10
Bareground	15.00	10.95	10
Rock	15.00	8.94	10

B.

COMPOSITION	PERCENT	STANDARD DEVIATION	SAMPLE SIZE
Shrubs	7.00	11.40	10
Forbs	14.56	21.50	10
Grasses	78.44	19.71	10

C.

COVER BY SPECIES	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE	RELATIVE FREQUENCY
Trees & Shrubs				
Ceratoides lanata	1.00	3.00	10	10.00
Rosa woodsii	2.00	6.00	10	10.00
Symphoricarpos oreophilus	1.00	3.00	10	10.00
Forbs				
Aster foliaceus	4.50	7.89	10	30.00
Machaeranthera grindelioides	0.50	1.50	10	10.00
Salsola pestifer	2.50	7.50	10	10.00
Grasses				
Elymus spicatus	11.00	13.93	10	40.00
Elymus hispidus	0.50	1.50	10	10.00
Elymus cinereus	28.50	28.81	10	80.00
Elymus lanceolatus	9.50	10.83	10	60.00

TABLE 2: Summary for woody species density and annual production for the reclaimed areas of the Gordon Creek 3 & 6 Mines (Area "A", see Sample Map).

A.

WOODY SPECIES DENSITY	NUMBER/ACRE
Artemisia tridentata	87.12
Ceratoides lanata	261.36
Pseudotsuga menziesii	21.78
Quercus gambelii	65.34
Rosa woodsii	87.12
Symphoricarpos oreophilus	457.38
TOTAL	980.10

B.

ANNUAL PRODUCTION

LIFEFORM	LBS/ ACRE	STANDARD DEVIATION	SAMPLE* SIZE
Herbaceous	1307.55	534.54	5(25)
Woody Spp.	144.49	203.99	5(25)
TOTAL	1452.04	504.14	5(25)

* Number in parentheses include estimates made by "double sampling".

TABLE 3: Summary of total cover, composition and cover by species for the reclaimed areas of the Gordon Creek 3 & 6 Mines (Area "B", see Sample Map).

A.

TOTAL COVER	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE
Living Cover	50.00	5.48	10
Litter	15.00	4.47	10
Bareground	13.00	7.48	10
Rock	22.00	5.57	10

B.

COMPOSITION	PERCENT	STANDARD DEVIATION	SAMPLE SIZE
Shrubs	8.11	14.72	10
Forbs	20.76	16.35	10
Grasses	71.13	21.61	10

C.

COVER BY SPECIES	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE	RELATIVE FREQUENCY
Trees & Shrubs				
Artemisia tridentata	0.50	1.50	10	10.00
Chrysothamnus nauseosus	3.50	7.43	10	30.00
Forbs				
Aster foliaceus	1.50	3.20	10	20.00
Cynoglossum officinale	1.00	2.00	10	20.00
Epilobium brachycarpum	1.00	2.00	10	20.00
Eriogonum sp.	0.50	1.50	10	10.00
Grindelia squarrosa	0.50	1.50	10	10.00
Machaeranthera canescens	2.50	3.35	10	40.00
Medicago sativa	1.50	3.20	10	20.00
Melilotus officinalis	2.00	3.32	10	30.00
Grasses				
Bromus carinatus	0.50	1.50	10	10.00
Bromus tectorum	0.50	1.50	10	10.00
Elymus spicatus	14.00	15.13	10	60.00
Elymus cinereus	11.50	15.82	10	40.00
Elymus lanceolatus	9.00	12.41	10	50.00

TABLE 4: Summary for woody species density and annual production for the reclaimed areas of the Gordon Creek 3 & 6 Mines (Area "B", see Sample Map).

A.

WOODY SPECIES DENSITY	NUMBER/ACRE
Artemisia tridentata	457.38
Cercocarpus montanus	21.78
Chrysothamnus nauseosus	544.50
TOTAL	1023.66

B.

ANNUAL PRODUCTION

LIFEFORM	LBS/ ACRE	STANDARD DEVIATION	SAMPLE* SIZE
Herbaceous	1636.47	745.59	5(25)
Woody Spp.	11.99	23.99	5(25)
TOTAL	1648.46	756.23	5(25)

* Number in parentheses include estimates made by "double sampling".

TABLE 5: Summary of total cover, composition and cover by species for the reclaimed areas of the Gordon Creek 3 & 6 Mines (Area "C", see Sample Map).

A.

TOTAL COVER	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE
Living Cover	49.50	11.72	10
Litter	8.00	4.58	10
Bareground	16.00	12.81	10
Rock	26.50	10.50	10

B.

COMPOSITION	PERCENT	STANDARD DEVIATION	SAMPLE SIZE
Shrubs	15.73	25.86	10
Forbs	27.63	10.62	10
Grasses	56.64	26.06	10

C.

COVER BY SPECIES	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE	RELATIVE FREQUENCY
Trees & Shrubs				
Artemisia tridentata	6.50	13.43	10	20.00
Chrysothamnus nauseosus	3.00	5.10	10	30.00
Forbs				
Aster foliaceus	3.00	9.00	10	10.00
Machaeranthera canescens	2.50	4.61	10	30.00
Medicago sativa	7.50	7.83	10	70.00
Melilotus officinalis	1.00	3.00	10	10.00
Grasses				
Elymus spicatus	15.50	9.86	10	90.00
Elymus cinereus	8.50	9.23	10	60.00
Poa segunda	2.00	3.32	10	30.00

TABLE 6: Summary for woody species density and annual production for the reclaimed areas of the Gordon Creek 3 & 6 Mines (Area "C", see Sample Map).

A.

WOODY SPECIES DENSITY	NUMBER/ACRE
Artemisia tridentata	370.26
Chrysothamnus nauseosus	435.60
Rosa woodsii	21.28
TOTAL	827.64

B.

ANNUAL PRODUCTION

LIFEFORM	LBS/ ACRE	STANDARD DEVIATION	SAMPLE* SIZE
Herbaceous	797.96	201.96	5(25)
Woody Spp.	134.92	269.84	5(25)
TOTAL	932.88	335.67	5(25)

* Number in parentheses include estimates made by "double sampling".

TABLE 7: Summary of total cover, composition and cover by species for the reclaimed areas of the Gordon Creek 3 & 6 Mines (Area "D", see Sample Map).

A.

TOTAL COVER	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE
Living Cover	50.50	8.79	10
Litter	9.00	4.36	10
Bareground	17.50	5.59	10
Rock	23.00	9.54	10

B.

COMPOSITION	PERCENT	STANDARD DEVIATION	SAMPLE SIZE
Shrubs	15.68	15.12	10
Forbs	32.46	15.81	10
Grasses	51.85	16.62	10

C.

COVER BY SPECIES	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE	RELATIVE FREQUENCY
Trees & Shrubs				
Chrysothamnus nauseosus	7.50	8.44	10	70.00
Kochia prostrata	0.50	1.50	10	10.00
Forbs				
Hedysarum boreale	1.00	3.00	10	10.00
Machaeranthera canescens	1.50	3.20	10	20.00
Medicago sativa	11.50	7.09	10	100.00
Melilotus officinalis	2.00	2.45	10	40.00
Grasses				
Elymus spicatus	6.50	8.38	10	40.00
Elymus cinereus	10.50	17.95	10	60.00
Elymus lanceolatus	8.50	11.41	10	40.00
Poa secunda	1.00	2.00	10	20.00

TABLE 8: Summary for woody species density and annual production for the reclaimed areas of the Gordon Creek 3 & 6 Mines (Area "D", see Sample Map).

A.

WOODY SPECIES DENSITY	NUMBER/ACRE
Artemisia tridentata	609.84
Ceratoides lanata	43.56
Chrysothamnus nauseosus	936.54
Kochia prostrata	43.56
TOTAL	1633.50

B.

ANNUAL PRODUCTION

LIFEFORM	LBS/ ACRE	STANDARD DEVIATION	SAMPLE* SIZE
Herbaceous	648.33	201.89	5(25)
Woody Spp.	111.72	137.67	5(25)
TOTAL	760.05	302.66	5(25)

* Number in parentheses include estimates made by "double sampling".

TABLE 9: Summary of total cover, composition and cover by species for the reclaimed areas of the Gordon Creek 3 & 6 Mines (Area "E", see Sample Map).

A.

TOTAL COVER	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE
Living Cover	52.00	7.48	10
Litter	18.00	7.81	10
Bareground	16.00	8.89	10
Rock	14.00	9.43	10

B.

COMPOSITION	PERCENT	STANDARD DEVIATION	SAMPLE SIZE
Shrubs	25.11	13.68	10
Forbs	7.56	8.19	10
Grasses	67.33	16.66	10

C.

COVER BY SPECIES	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE	RELATIVE FREQUENCY
Trees & Shrubs				
Artemisia nova	1.00	3.00	10	10.00
Atriplex canescens	1.00	3.00	10	10.00
Chrysothamnus nauseosus	1.00	3.00	10	10.00
Kochia prostrata	10.00	8.94	10	50.00
Forbs				
Aster foliaceus	1.00	3.00	10	10.00
Machaeranthera canescens	0.50	1.50	10	10.00
Medicago sativa	2.50	3.35	10	40.00
Grasses				
Agropyron cristatum	0.50	1.50	10	10.00
Elymus cinereus	19.50	8.20	10	100.00
Elymus lanceolatus	3.00	4.58	10	40.00
Elymus spicatus	9.00	7.00	10	80.00
Poa pratensis	3.00	4.58	10	30.00

TABLE 10: Summary for woody species density and annual production for the reclaimed areas of the Gordon Creek 3 & 6 Mines (Area "E", see Sample Map).

A.

WOODY SPECIES DENSITY	NUMBER/ACRE
Artemisia tridentata	196.02
Chrysothamnus nauseosus	631.62
Gutierrezia sarothrae	21.02
Kochia prostrata	1001.88
TOTAL	1851.30

B.

ANNUAL PRODUCTION

LIFEFORM	LBS/ ACRE	STANDARD DEVIATION	SAMPLE* SIZE
Herbaceous	1081.94	295.55	5(25)
Woody Spp.	160.06	109.91	5(25)
TOTAL	1241.99	326.14	5(25)

* Number in parentheses include estimates made by "double sampling".

TABLE 11: Summary of total cover, composition and cover by species for the reclaimed areas of the Gordon Creek 3 & 6 Mines (Area "F", see Sample Map).

A.

TOTAL COVER	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE
Living Cover	46.50	4.50	10
Litter	8.50	4.50	10
Bareground	24.00	7.35	10
Rock	21.00	6.24	10

B.

COMPOSITION	PERCENT	STANDARD DEVIATION	SAMPLE SIZE
Shrubs	5.33	11.08	10
Forbs	27.24	12.31	10
Grasses	67.42	20.97	10

C.

COVER BY SPECIES	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE	RELATIVE FREQUENCY
Trees & Shrubs				
Artemisia tridentata	2.00	4.00	10	20.00
Chrysothamnus nauseosus	0.50	1.50	10	10.00
Forbs				
Epilobium halleanum	1.00	2.00	10	20.00
Machaeranthera canescens	2.00	2.45	10	40.00
Medicago sativa	9.50	6.10	10	90.00
Grasses				
Elymus spicatus	6.50	8.08	10	50.00
Elymus cinereus	9.00	5.39	10	100.00
Elymus lanceolatus	10.00	9.22	10	80.00
Poa pratensis	6.00	7.68	10	50.00

TABLE 12: Summary for woody species density and annual production for the reclaimed areas of the Gordon Creek 3 & 6 Mines (Area "F", see Sample Map).

A.

WOODY SPECIES DENSITY	NUMBER/ACRE
Artemisia tridentata	3615.48
Chrysothamnus nauseosus	108.90
Gutierrezia sarothrae	21.78
Pinus ponderosa	21.78
TOTAL	3767.94

B.

ANNUAL PRODUCTION

LIFEFORM	LBS/ ACRE	STANDARD DEVIATION	SAMPLE* SIZE
Herbaceous	571.09	207.46	5(25)
Woody Spp.	45.14	90.30	5(25)
TOTAL	616.24	165.60	5(25)

* Number in parentheses include estimates made by "double sampling".

TABLE 13: Summary of total cover, composition and cover by species for the reclaimed areas of the Gordon Creek 3 & 6 Mines (Area "G", see Sample Map).

A.

TOTAL COVER	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE
Living Cover	52.50	7.83	10
Litter	10.00	4.47	10
Bareground	20.00	7.42	10
Rock	17.50	5.12	10

B.

COMPOSITION	PERCENT	STANDARD DEVIATION	SAMPLE SIZE
Shrubs	6.32	8.70	10
Forbs	4.84	4.97	10
Grasses	88.84	12.44	10

C.

COVER BY SPECIES	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE	RELATIVE FREQUENCY
Trees & Shrubs				
Artemisia tridentata	1.50	3.20	10	20.00
Chrysothamnus nauseosus	0.50	1.50	10	10.00
Gutierrezia sarothrae	1.00	3.00	10	10.00
Forbs				
Medicago sativa	2.50	2.50	10	50.00
Grasses				
Dactylis glomeratus				
Elymus spicatus	8.00	7.81	10	60.00
Elymus cinereus	29.00	15.62	10	100.00
Elymus lanceolatus	8.50	9.50	10	60.00
Poa pratensis	1.50	2.29	10	30.00

TABLE 14: Summary for woody species density and annual production for the reclaimed areas of the Gordon Creek 3 & 6 Mines (Area "G", see Sample Map).

A.

WOODY SPECIES DENSITY	NUMBER/ACRE
Artemisia tridentata	239.58
Ceratoides lanata	152.46
Chrysothamnus nauseosus	65.34
Eriogonum corymbosum	21.78
Gutierrezia sarothrae	21.78
Kochia prostrata	21.78
TOTAL	522.72

B.

ANNUAL PRODUCTION

LIFEFORM	LBS/ ACRE	STANDARD DEVIATION	SAMPLE* SIZE
Herbaceous	1315.80	521.72	5(25)
Woody Spp.	8.14	11.24	5(25)
TOTAL	1323.94	518.68	5(25)

* Number in parentheses include estimates made by "double sampling".

TABLE 15: Summary of total cover, composition and cover by species for the reclaimed areas of the Gordon Creek 3 & 6 Mines (Area "H", see Sample Map).

A.

TOTAL COVER	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE
Living Cover	45.00	10.25	10
Litter	7.00	6.00	10
Bareground	28.00	11.00	10
Rock	20.00	8.37	10

B.

COMPOSITION	PERCENT	STANDARD DEVIATION	SAMPLE SIZE
Shrubs	34.51	23.02	10
Forbs	18.38	11.52	10
Grasses	47.11	21.90	10

C.

COVER BY SPECIES	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE	RELATIVE FREQUENCY
Trees & Shrubs				
Artemisia tridentata	3.50	5.94	10	40.00
Ceratoides lanata	0.50	1.50	10	10.00
Chrysothamnus nauseosus	6.50	6.34	10	60.00
Eriogonum corymbosum	1.00	3.00	10	10.00
Gutierrezia sarothrae	1.00	3.00	10	10.00
Kochia prostrata	2.00	4.00	10	20.00
Forbs				
Cynoglossum officinale	2.50	7.50	10	10.00
Epilobium halleanum	0.50	1.50	10	10.00
Kochia scoparia	1.50	3.20	10	20.00
Lactuca serriola	0.50	1.50	10	10.00
Machaeranthera canescens	2.00	2.00	10	40.00
Medicago sativa	1.00	2.00	10	20.00
Melilotus officinale	0.50	1.50	10	10.00
Polygonum aviculare	0.50	1.50	10	10.00
Grasses				
Bromus tectorum	5.50	6.50	10	50.00
Elymus cinereus	8.50	8.08	10	60.00
Elymus lanceolatus	7.50	8.44	10	50.00

TABLE 16: Summary for woody species density and annual production for the reclaimed areas of the Gordon Creek 3 & 6 Mines (Area "H", see Sample Map).

A.

WOODY SPECIES DENSITY	NUMBER/ACRE
Artemisia tridentata	2482.92
Ceratoides lanata	65.34
Chrysothamnus nauseosus	1916.64
Gutierrezia sarothrae	21.78
Kochia prostrata	566.28
TOTAL	5056.96

B.

ANNUAL PRODUCTION

LIFEFORM	LBS/ ACRE	STANDARD DEVIATION	SAMPLE* SIZE
Herbaceous	337.23	240.15	5(25)
Woody Spp.	424.32	309.49	5(25)
TOTAL	761.55	368.12	5(25)

* Number in parentheses include estimates made by "double sampling".

TABLE 17: Summary of total cover, composition and cover by species for the reclaimed areas of the Gordon Creek 3 & 6 Mines (Areas "A-H" combined, see Sample Map).

A.

TOTAL COVER	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE
Living Cover	50.75	9.56	80
Litter	10.56	6.37	80
Bareground	18.69	10.36	80
Rock	20.00	9.01	80

B.

COMPOSITION	PERCENT	STANDARD DEVIATION	SAMPLE SIZE
Shrubs	14.78	19.14	80
Forbs	18.99	16.51	80
Grasses	66.24	23.76	80

C.

COVER BY SPECIES	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE	RELATIVE FREQUENCY
Trees & Shrubs				
Artemisia nova	0.13	1.11	80	1.25
Artemisia tridentata	1.75	5.92	80	13.75
Atriplex canescens	0.13	1.11	80	1.25
Ceratoides lanata	0.19	1.24	80	2.50
Chrysothamnus nauseosus	2.81	5.75	80	26.25
Eriogonum corymbosum	0.13	1.11	80	1.25
Gutierrezia sarothae	0.25	1.56	80	2.50
Kochia prostrata	1.56	4.78	80	11.25
Rosa woodsii	0.25	2.22	80	1.25
Symphoricarpos oreophilus	0.13	1.11	80	1.25
Forbs				
Aster foliaceus	1.13	4.68	80	7.50
Cynoglossum officinale	0.44	2.87	80	3.75
Epilobium brachycarpum	0.31	1.21	80	6.25
Eriogonum sp.	0.06	0.56	80	1.25
Grindelia squarrosa	0.06	0.56	80	1.25
Hedysarum boreale	0.13	1.11	80	1.25
Kochia scoparia	0.19	1.24	80	2.50
Lactuca serriola	0.06	0.56	80	1.25
Machaeranthera canescens	1.38	2.85	80	21.25

TABLE 17 (continued)

Machaeranthera grindelioides	0.06	0.56	80	1.25
Medicago sativa	4.50	6.25	80	47.50
Melilotus officinalis	0.69	2.05	80	11.25
Polygonum aviculare	0.06	0.56	80	1.25
Salsola pestifer	0.31	2.78	80	1.25
Grasses				
Agropyron cristatum	0.06	0.56	80	1.25
Bromus carinatus	0.06	0.56	80	1.25
Bromus tectorum	0.75	2.97	80	7.50
Elymus cinereus	15.63	17.47	80	47.50
Elymus hispidus	0.06	0.56	80	1.25
Elymus lanceolatus	7.00	9.73	80	47.50
Elymus spicatus	8.81	10.79	80	51.25
Poa pratensis	1.31	3.85	80	12.50
Poa secunda	0.38	1.54	80	6.25

TABLE 18: Summary for woody species density and annual production for the reclaimed areas of the Gordon Creek 3 & 6 Mines (Areas "A-H" combined, see Sample Map).

A.

WOODY SPECIES DENSITY	NUMBER/ACRE
Artemisia tridentata	1006.40
Cercocarpus montanus	2.72
Ceratoides lanata	65.28
Chrysothamnus nauseosus	579.36
Eriogonum corymbosum	2.72
Gutierrezia sarothrae	10.88
Kochia prostrata	198.56
Quercus gambelii	8.16
Pinus ponderosa	2.72
Pseudotsuga menziesii	2.72
Rosa woodsii	2.72
Suaeda torreyana	5.44
Symphoricarpos oreophilus	57.12
TOTAL	1944.80

B.

ANNUAL PRODUCTION

LIFEFORM	LBS/ ACRE	STANDARD DEVIATION	SAMPLE* SIZE
Herbaceous	969.88	605.54	40(200)
Woody Spp.	130.27	216.20	40(200)
TOTAL PRODUCTION	1100.15	579.46	40(200)

* Number in parentheses include estimates made by "double sampling".

TABLE 19: Summary of total cover, composition and cover by species for the reference area of the Gordon Creek 3 & 6 Mines (see Sample Map).

A.

TOTAL COVER	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE
Living Cover	42.83	7.92	30
Litter	10.17	5.55	30
Bareground	18.50	8.58	30
Rock	28.50	13.43	30

B.

COMPOSITION	PERCENT	STANDARD DEVIATION	SAMPLE SIZE
Shrubs	48.92	17.32	30
Forbs	14.58	13.96	30
Grasses	36.50	14.34	30

C.

COVER BY SPECIES	% MEAN COVER	STANDARD DEVIATION	SAMPLE SIZE	RELATIVE FREQUENCY
Trees & Shrubs				
Artemisia frigida	15.83	9.41	30	100.00
Cercocarpus montanus	1.67	5.53	30	16.67
Chrysothamnus depressus	0.50	1.50	30	10.00
Eriogonum corymbosum	2.00	6.40	30	10.00
Gutierrezia sarothrae	1.00	2.38	30	16.67
Forbs				
Asclepias sp.	0.07	0.36	30	3.33
Astragalus mollissimus	0.50	1.50	30	30.00
Hedysarum boreale	3.83	6.79	30	43.33
Machaeranthera grindelioides	1.83	2.41	30	36.64
Grasses				
Elymus salinus	15.17	6.64	30	100.00
Stipa hymenoides	0.43	1.86	30	6.67

TABLE 20: Summary for woody species density and annual production for the reference area of the Gordon Creek 3 & 6 Mines (combined, see Sample Map).

A.

WOODY SPECIES DENSITY	NUMBER/ACRE
Artemisia frigida	6791.89
Ceratoides lanata	34.86
Cercocarpus montanus	244.02
Chrysothamnus depressus	145.25
Eriogonum corymbosum	232.40
Gutierrezia sarothrae	505.47
Pinus edulis	11.62
TOTAL	7965.51

B.

ANNUAL PRODUCTION

LIFEFORM	LBS/ ACRE	STANDARD DEVIATION	SAMPLE* SIZE
Herbaceous	195.75	89.72	30(150)
Woody Spp.	212.33	65.96	30(150)
TOTAL	408.09	79.24	30(150)

* Number in parentheses include estimates made by "double sampling".

TABLE 21: Statistical summary sheet for the reclaimed areas and reference areas at Gordon Creek No. 3 & 6 Mines.

RECLAIMED AREAS (A-E Combined)			
Living Cover*	x=50.75	s=9.56	n=80
Density	x=1944.80	s= **	n=64
Production	x=1100.15	s=579.46	n=40(200)
REFERENCE AREA			
Living Cover*	x=42.83	s=7.92	n=30
Density**	x=1000***	s= **	n=30
Production	x=408.09	s=79.24	n=30(150)
STATISTICAL ANALYSES			
Cover	t=4.044	df=108	SL=p<.001
Density	t= **	df= --	SL= --
Production	t=6.845	df=68	SL=p<.001

x = sample mean, s = sample standard deviation,
n = sample size, NS = nonsignificant,
p = probability level of significance
* represents understory and overstory cover combined.
** differences obvious, s and t values not calculated
*** predetermined and approved standard

COLOR PHOTOGRAPHS

Reclaimed Area "A"

Reclaimed Area "B"

Reclaimed Area "C"

Reclaimed Area "D"

Reclaimed Area "E"

Reclaimed Area "F"

Reclaimed Area "G"

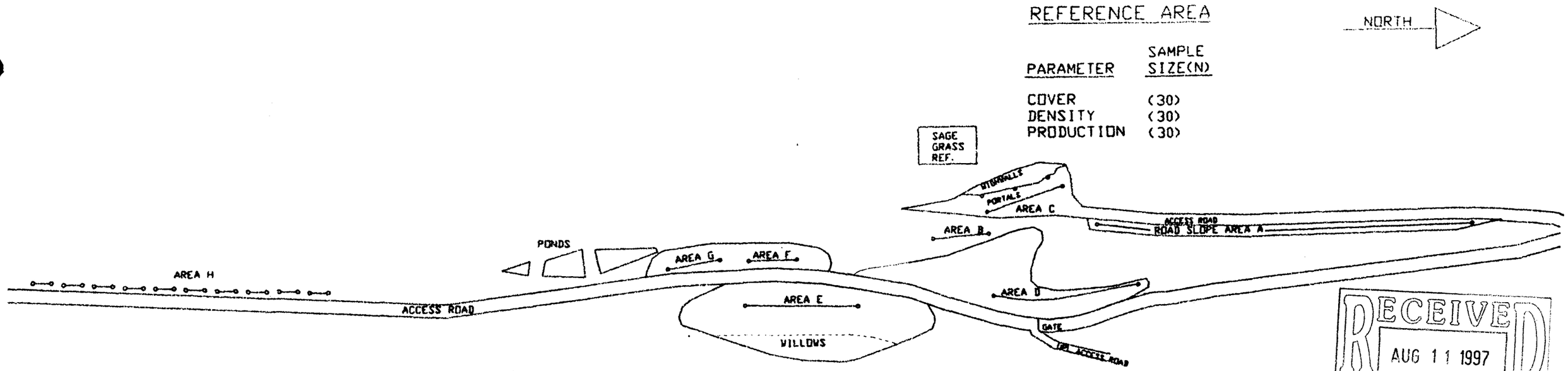
Reclaimed Area "H"

Reference Area

SAMPLE MAP

REFERENCE AREA

PARAMETER	SAMPLE SIZE(N)
COVER	(30)
DENSITY	(30)
PRODUCTION	(30)



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SAMPLE AREA	PARAMETER	SAMPLE SIZE(N)
A-H	COVER	(80)
	DENSITY	(64)
	PRODUCTION	(40)

SAMPLE AREA	PARAMETER	SAMPLE SIZE(N)
A	COVER	(10)
	DENSITY	(8)
	PRODUCTION	(5)
B	COVER	(10)
	DENSITY	(8)
	PRODUCTION	(5)
C	COVER	(10)
	DENSITY	(8)
	PRODUCTION	(5)
D	COVER	(10)
	DENSITY	(8)
	PRODUCTION	(5)
E	COVER	(10)
	DENSITY	(8)
	PRODUCTION	(5)

SAMPLE AREA	PARAMETER	SAMPLE SIZE(N)
F	COVER	(10)
	DENSITY	(8)
	PRODUCTION	(5)
G	COVER	(10)
	DENSITY	(8)
	PRODUCTION	(5)
H	COVER	(10)
	DENSITY	(8)
	PRODUCTION	(5)

TRANSECT LINES

GORDON CREEK NO. 3&6
SAMPLE LOCATION MAP
1995

MT. NEBO SCIENTIFIC
RESEARCH AND CONSULTING

DRAWN	S. LEWIS
CHECKED	P. COLLINS
DATE	9-25-95
SCALE	NOT TO SCALE

GC36.DWG

COLOR PHOTOGRAPHS

APPENDIX A:

RAW DATA

BLACKHAWK

[illegible]ion Creek 3 & 6

[illegible]laimed Mine Site

Area "A" - Road Slope

Exposure: E

Slope: 39 deg.

Sample Date: 21 Aug 1995	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00	Mean	SDev	Freq
TREES & SHRUBS													
Rosa woodsii	20.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	6.00	10.00
Ceratoides lanata	0.00	0.00	0.00	0.00	0.00	0.00	10.00	0.00	0.00	0.00	1.00	3.00	10.00
Symphoricarpos oreophilus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00	0.00	0.00	1.00	3.00	10.00
FORBS													
Aster foliaceus	0.00	20.00	0.00	0.00	5.00	0.00	0.00	0.00	20.00	0.00	4.50	7.89	30.00
Machaeranthera grindelioides	0.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	1.50	10.00
Salsola pestifer	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	25.00	2.50	7.50	10.00
GRASSES													
Elymus hispidus	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	1.50	10.00
Elymus lanceolatus	35.00	20.00	0.00	10.00	0.00	5.00	0.00	10.00	0.00	15.00	9.50	10.83	60.00
Elymus cinereus	0.00	0.00	75.00	35.00	70.00	65.00	15.00	5.00	10.00	10.00	28.50	28.81	80.00
Elymus spicatus	0.00	0.00	0.00	20.00	0.00	0.00	25.00	35.00	30.00	0.00	11.00	13.93	40.00
COVER													
Total Living Cover	60.00	45.00	75.00	65.00	75.00	70.00	50.00	60.00	60.00	50.00	61.00	9.95	
Litter	5.00	5.00	5.00	5.00	15.00	20.00	10.00	10.00	10.00	5.00	9.00	4.90	
Bareground	10.00	30.00	5.00	5.00	5.00	5.00	10.00	20.00	25.00	35.00	15.00	10.95	
Rock	25.00	20.00	15.00	25.00	5.00	5.00	30.00	10.00	5.00	10.00	15.00	8.94	
% COMPOSITION													
Shrubs	33.33	0.00	0.00	0.00	0.00	0.00	20.00	16.67	0.00	0.00	7.00	11.40	
Forbs	0.00	55.56	0.00	0.00	6.67	0.00	0.00	0.00	33.33	50.00	14.56	21.50	
Grasses	66.67	44.44	100.00	100.00	93.33	100.00	80.00	83.33	66.67	50.00	78.44	19.71	

BLACKHAWK

[illegible]on Creek 3 & 6

[illegible]aimed Mine Site

Area "B" - Pad Slope

Exposure: E

Slope: 39 deg.

Sample Date: 21 Aug 1995	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00	Mean	SDev	Freq
TREES & SHRUBS													
Chrysothamnus nauseosus	5.00	5.00	0.00	0.00	0.00	0.00	0.00	25.00	0.00	0.00	3.50	7.43	30.00
Artemisia tridentata	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	0.50	1.50	10.00
FORBS													
Cynoglossum officinale	0.00	0.00	0.00	0.00	0.00	5.00	0.00	5.00	0.00	0.00	1.00	2.00	20.00
Melilotus officinalis	10.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	0.00	2.00	3.32	30.00
Machaeranthera canscens	10.00	0.00	5.00	5.00	0.00	0.00	0.00	5.00	0.00	0.00	2.50	3.35	40.00
Eriogonum sp.	0.00	0.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	1.50	10.00
Aster foliaceus	0.00	0.00	0.00	0.00	5.00	10.00	0.00	0.00	0.00	0.00	1.50	3.20	20.00
Grindelia squarrosa	0.00	0.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	1.50	10.00
Epilobium halleanum	0.00	5.00	0.00	0.00	5.00	0.00	0.00	0.00	0.00	0.00	1.00	2.00	20.00
Medicago sativa	0.00	0.00	10.00	0.00	0.00	5.00	0.00	0.00	0.00	0.00	1.50	3.20	20.00
GRASSES													
Bromus tectorum	0.00	0.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	1.50	10.00
Elymus lanceolatus	0.00	5.00	20.00	0.00	0.00	0.00	10.00	15.00	40.00	0.00	9.00	12.41	50.00
Elymus cinereus	15.00	0.00	0.00	0.00	40.00	20.00	40.00	0.00	0.00	0.00	11.50	15.82	40.00
Elymus spicatus	10.00	25.00	0.00	40.00	15.00	10.00	0.00	0.00	0.00	40.00	14.00	15.13	60.00
Bromus carinatus	0.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	1.50	10.00
COVER													
Total Living Cover	50.00	50.00	50.00	45.00	65.00	50.00	50.00	50.00	45.00	45.00	50.00	5.48	
Litter	10.00	10.00	10.00	20.00	15.00	20.00	15.00	20.00	10.00	20.00	15.00	4.47	
Bareground	10.00	10.00	20.00	10.00	5.00	5.00	10.00	10.00	30.00	20.00	13.00	7.48	
Rock	30.00	30.00	20.00	25.00	15.00	25.00	25.00	20.00	15.00	15.00	22.00	5.57	
% COMPOSITION													
Shrubs	10.00	10.00	0.00	0.00	0.00	0.00	0.00	50.00	0.00	11.11	8.11	14.72	
Forbs	40.00	20.00	50.00	11.11	15.38	40.00	0.00	20.00	11.11	0.00	20.76	16.35	
Grasses	50.00	70.00	50.00	88.89	84.62	60.00	100.00	30.00	88.89	88.89	71.13	21.61	

BLACKHAWK

don Creek 3 & 6

laimed Mine Site

Area "C" - Portal Pad

Exposure: E

Slope: 2 deg.

Sample Date: 22 Aug 1995	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00	Mean	SDev	Freq
TREES & SHRUBS													
Chrysothamus nauseosus	0.00	0.00	0.00	0.00	5.00	10.00	0.00	0.00	0.00	15.00	3.00	5.10	30.00
Artemisia tridentata	0.00	0.00	0.00	0.00	25.00	40.00	0.00	0.00	0.00	0.00	6.50	13.43	20.00
FORBS													
Medicago sativa	0.00	5.00	25.00	15.00	0.00	5.00	15.00	5.00	5.00	0.00	7.50	7.83	70.00
Melilotus officinalis	10.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	3.00	10.00
Aster foliaceus	0.00	0.00	0.00	0.00	30.00	0.00	0.00	0.00	0.00	0.00	3.00	9.00	10.00
Machaeranthera canescens	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	5.00	15.00	2.50	4.61	30.00
GRASSES													
Poa secunda	0.00	5.00	0.00	10.00	0.00	0.00	0.00	5.00	0.00	0.00	2.00	3.32	30.00
Elymus cinereus	20.00	5.00	0.00	20.00	10.00	0.00	25.00	0.00	5.00	0.00	8.50	9.23	60.00
Elymus spicatus	10.00	20.00	35.00	10.00	0.00	10.00	10.00	25.00	25.00	10.00	15.50	9.86	90.00
COVER													
Total Living Cover	40.00	35.00	60.00	55.00	70.00	65.00	50.00	40.00	40.00	40.00	49.50	11.72	
Litter	10.00	5.00	5.00	20.00	5.00	10.00	10.00	5.00	5.00	5.00	8.00	4.58	
Bareground	15.00	50.00	5.00	10.00	5.00	5.00	20.00	10.00	20.00	20.00	16.00	12.81	
Rock	35.00	10.00	30.00	15.00	20.00	20.00	20.00	45.00	35.00	35.00	26.50	10.50	
% COMPOSITION													
Shrubs	0.00	0.00	0.00	0.00	42.86	76.92	0.00	0.00	0.00	37.50	15.73	25.86	
Forbs	25.00	14.29	41.67	27.27	42.86	7.69	30.00	25.00	25.00	37.50	27.63	10.62	
Grasses	75.00	85.71	58.33	72.73	14.29	15.38	70.00	75.00	75.00	25.00	56.64	26.06	

BLACKHAWK

don Creek 3 & 6

laimed Mine Site

Area "D"

Exposure: SE E

Slope: 25 - 30 deg.

Sample Date: 22 Aug 1995	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00	Mean	SDev	Freq
TREES & SHRUBS													
Chrysothamnus nauseosus	10.00	10.00	25.00	0.00	0.00	5.00	0.00	20.00	0.00	5.00	7.50	8.44	70.00
Kochia prostrata	0.00	0.00	0.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	1.50	10.00
FORBS													
Hedysarum boreale	0.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	3.00	10.00
Medicago sativa	20.00	5.00	10.00	5.00	20.00	5.00	10.00	5.00	10.00	25.00	11.50	7.09	100.00
Machaeranthera canescens	0.00	0.00	0.00	10.00	0.00	0.00	5.00	0.00	0.00	0.00	1.50	3.20	20.00
Melilotus officinalis	5.00	0.00	5.00	0.00	5.00	0.00	5.00	0.00	0.00	0.00	2.00	2.45	40.00
GRASSES													
Elymus lanceolatus	0.00	25.00	0.00	20.00	0.00	30.00	10.00	0.00	0.00	0.00	8.50	11.41	40.00
Elymus cinerus	5.00	0.00	0.00	5.00	5.00	0.00	5.00	25.00	60.00	0.00	10.50	17.95	60.00
Elymus spicatus	20.00	0.00	15.00	0.00	20.00	0.00	0.00	0.00	0.00	10.00	6.50	8.38	40.00
Poa secunda	0.00	0.00	0.00	0.00	0.00	0.00	5.00	0.00	0.00	5.00	1.00	2.00	20.00
COVER													
Total Living Cover	60.00	50.00	55.00	45.00	50.00	40.00	40.00	50.00	70.00	45.00	50.50	8.79	
Litter	10.00	5.00	10.00	5.00	10.00	5.00	5.00	10.00	10.00	20.00	9.00	4.36	
Bareground	15.00	30.00	15.00	20.00	10.00	20.00	15.00	20.00	10.00	20.00	17.50	5.59	
Rock	15.00	15.00	20.00	30.00	30.00	35.00	40.00	20.00	10.00	15.00	23.00	9.54	
% COMPOSITION													
Shrubs	16.67	20.00	45.45	11.11	0.00	12.50	0.00	40.00	0.00	11.11	15.68	15.12	
Forbs	41.67	30.00	27.27	33.33	50.00	12.50	50.00	10.00	14.29	55.56	32.46	15.81	
Grasses	41.67	50.00	27.27	55.56	50.00	75.00	50.00	50.00	85.71	33.33	51.85	16.62	

BLACKHAWK

[illegible]on Creek 3 & 6

[illegible]laimed Mine Site

Area "E"

Exposure: E

Slope:

Sample Date: 28 Aug 1995	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00	Mean	SDev	Freq
TREES & SHRUBS													
Chrysothamus nauseosus	0.00	0.00	0.00	0.00	0.00	10.00	0.00	0.00	0.00	0.00	1.00	3.00	10.00
Kochia prostrata	10.00	0.00	15.00	15.00	0.00	0.00	0.00	25.00	20.00	15.00	10.00	8.94	50.00
Artemisia nova	0.00	0.00	0.00	0.00	10.00	0.00	0.00	0.00	0.00	0.00	1.00	3.00	10.00
Atriplex canescens	0.00	0.00	0.00	0.00	0.00	0.00	10.00	0.00	0.00	0.00	1.00	3.00	10.00
FORBS													
Aster foliaceus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00	1.00	3.00	10.00
Machaeranthera canescens	0.00	0.00	0.00	0.00	0.00	5.00	0.00	0.00	0.00	0.00	0.50	1.50	10.00
Medicago sativa	0.00	0.00	10.00	0.00	5.00	5.00	0.00	0.00	5.00	0.00	2.50	3.35	40.00
GRASSES													
Agropyron cristatum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	0.00	0.00	0.50	1.50	10.00
Poa pratensis	0.00	0.00	10.00	0.00	0.00	0.00	10.00	10.00	0.00	0.00	3.00	4.58	30.00
Elymus cinereus	25.00	10.00	15.00	25.00	25.00	15.00	35.00	10.00	10.00	25.00	19.50	8.20	100.00
Elymus lanceolatus	0.00	10.00	0.00	0.00	0.00	10.00	0.00	0.00	10.00	0.00	3.00	4.58	40.00
Elymus spicatus	15.00	20.00	0.00	10.00	15.00	5.00	10.00	0.00	0.00	15.00	9.00	7.00	80.00
COVER													
Total Living Cover	50.00	40.00	50.00	50.00	55.00	50.00	65.00	50.00	45.00	65.00	52.00	7.48	
Litter	10.00	30.00	20.00	15.00	25.00	10.00	20.00	10.00	30.00	10.00	18.00	7.81	
Bareground	5.00	20.00	20.00	25.00	10.00	10.00	5.00	35.00	15.00	15.00	16.00	8.89	
Rock	35.00	10.00	10.00	10.00	10.00	30.00	10.00	5.00	10.00	10.00	14.00	9.43	
% COMPOSITION													
Shrubs	20.00	0.00	30.00	30.00	18.18	20.00	15.38	50.00	44.44	23.08	25.11	13.68	
Forbs	0.00	0.00	20.00	0.00	9.09	20.00	0.00	0.00	11.11	15.38	7.56	8.19	
Grasses	80.00	100.00	50.00	70.00	72.73	60.00	84.62	50.00	44.44	61.54	67.33	16.66	

BLACKHAWK

[illegible]don Creek 3 & 6

[illegible]claimed Mine Site

Area "F"

Exposure: SSW

Slope:

Sample Date: 28 Aug 1995	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00	Mean	SDev	Freq
TREES & SHRUBS													
Artemisia tridentata	0.00	0.00	10.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	4.00	20.00
Chrysothamnus nauseosus	0.00	0.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	1.50	10.00
FORBS													
Machaeranthera canescens	0.00	0.00	5.00	0.00	5.00	5.00	5.00	0.00	0.00	0.00	2.00	2.45	40.00
Medicago sativa	15.00	15.00	10.00	20.00	5.00	0.00	5.00	5.00	5.00	15.00	9.50	6.10	90.00
Epilobium halleanum	0.00	0.00	5.00	0.00	5.00	0.00	0.00	0.00	0.00	0.00	1.00	2.00	20.00
GRASSES													
Poa pratensis	25.00	5.00	0.00	10.00	10.00	10.00	0.00	0.00	0.00	0.00	6.00	7.68	50.00
Elymus lanceolatus	5.00	20.00	5.00	5.00	5.00	10.00	0.00	25.00	25.00	0.00	10.00	9.22	80.00
Elymus cinereus	5.00	5.00	0.00	5.00	10.00	20.00	15.00	10.00	10.00	10.00	9.00	5.39	100.00
Elymus spicatus	0.00	0.00	5.00	0.00	0.00	5.00	20.00	15.00	0.00	20.00	6.50	8.08	50.00
COVER													
Total Living Cover	50.00	45.00	45.00	50.00	40.00	50.00	45.00	55.00	40.00	45.00	46.50	4.50	
Litter	5.00	5.00	10.00	5.00	5.00	5.00	10.00	10.00	10.00	20.00	8.50	4.50	
Bareground	40.00	25.00	25.00	20.00	30.00	20.00	25.00	10.00	25.00	20.00	24.00	7.35	
Rock	5.00	25.00	20.00	25.00	25.00	25.00	20.00	25.00	25.00	15.00	21.00	6.24	
% COMPOSITION													
Shrubs	0.00	0.00	33.33	20.00	0.00	0.00	0.00	0.00	0.00	0.00	5.33	11.08	
Forbs	30.00	33.33	44.44	40.00	37.50	10.00	22.22	9.09	12.50	33.33	27.24	12.31	
Grasses	70.00	66.67	22.22	40.00	62.50	90.00	77.78	90.91	87.50	66.67	67.42	20.97	

BLACKHAWK

[illegible]don Creek 3 & 6

[illegible]claimed Mine Site

Area "G"

Exposure: E

Slope: 5-10 deg

Sample Date: 28 Aug 1995	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00	Mean	SDev	Freq
TREES & SHRUBS													
Artemisia tridentata	5.00	0.00	0.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	3.20	20.00
Chrysothamnus nauseosus	0.00	0.00	0.00	0.00	5.00	0.00	0.00	0.00	0.00	0.00	0.50	1.50	10.00
Gutierrezia sarothae	0.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	3.00	10.00
FORBS													
Medicago sativa	5.00	5.00	0.00	5.00	0.00	0.00	5.00	0.00	5.00	0.00	2.50	2.50	50.00
GRASSES													
Poa pratensis	0.00	5.00	0.00	5.00	0.00	0.00	0.00	0.00	5.00	0.00	1.50	2.29	30.00
Elymus lanceolatus	10.00	0.00	0.00	0.00	10.00	0.00	20.00	5.00	10.00	30.00	8.50	9.50	60.00
Elymus cinereus	10.00	20.00	30.00	25.00	20.00	60.00	40.00	50.00	25.00	10.00	29.00	15.62	100.00
Elymus spicatus	20.00	0.00	20.00	10.00	15.00	0.00	0.00	5.00	10.00	0.00	8.00	7.81	60.00
COVER													
Total Living Cover	50.00	40.00	50.00	55.00	50.00	60.00	65.00	60.00	55.00	40.00	52.50	7.83	
Litter	5.00	10.00	15.00	10.00	10.00	10.00	5.00	20.00	10.00	5.00	10.00	4.47	
Bareground	25.00	25.00	25.00	15.00	20.00	10.00	20.00	10.00	15.00	35.00	20.00	7.42	
Rock	20.00	25.00	10.00	20.00	20.00	20.00	10.00	10.00	20.00	20.00	17.50	5.12	
% COMPOSITION													
Shrubs	10.00	25.00	0.00	18.18	10.00	0.00	0.00	0.00	0.00	0.00	6.32	8.70	
Forbs	10.00	12.50	0.00	9.09	0.00	0.00	7.69	0.00	9.09	0.00	4.84	4.97	
Grasses	80.00	62.50	100.00	72.73	90.00	100.00	92.31	100.00	90.91	100.00	88.84	12.44	

BLACKHAWK

don Creek 3 & 6

claimed Mine Site

Area "H"

Exposure E

Slope

Sample Date 28 Aug 1995	1 00	2 00	3 00	4 00	5 00	6 00	7 00	8 00	9 00	10 00	Mean	SDev	Freq
TREES & SHRUBS													
Chrysothamus nauseosus	0 00	20 00	10 00	10 00	0 00	10 00	10 00	5 00	0 00	0 00	6 50	6 34	60 00
Artemisia tridentata	0 00	0 00	0 00	0 00	5 00	5 00	20 00	0 00	5 00	0 00	3 50	5 94	40 00
Kochia protrata	10 00	0 00	0 00	0 00	10 00	0 00	0 00	0 00	0 00	0 00	2 00	4 00	20 00
Eriogonum corymbosum	0 00	0 00	0 00	0 00	10 00	0 00	0 00	0 00	0 00	0 00	1 00	3 00	10 00
Gutierrezia sarothrae	0 00	0 00	0 00	10 00	0 00	0 00	0 00	0 00	0 00	0 00	1 00	3 00	10 00
Ceratoides	0 00	0 00	5 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 50	1 50	10 00
FORBS													
Medicago sativa	5 00	0 00	0 00	0 00	0 00	5 00	0 00	0 00	0 00	0 00	1 00	2 00	20 00
Machaeranthera canescens	0 00	0 00	5 00	0 00	5 00	5 00	0 00	0 00	0 00	5 00	2 00	2 45	40 00
Polygonum aviculare	0 00	5 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 50	1 50	10 00
Kochia scoparia	0 00	5 00	0 00	0 00	0 00	0 00	0 00	0 00	10 00	0 00	1 50	3 20	20 00
Cynoglossum officinale	0 00	0 00	0 00	25 00	0 00	0 00	0 00	0 00	0 00	0 00	2 50	7 50	10 00
Melilotus officinalis	5 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 50	1 50	10 00
Lactuca serriola	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	5 00	0 50	1 50	10 00
Epilobium halleanum	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 00	5 00	0 50	1 50	10 00
GRASSES													
Bromus tectorum	0 00	10 00	5 00	10 00	0 00	0 00	10 00	0 00	20 00	0 00	5 50	6 50	50 00
Elymus lanceolatus	0 00	10 00	15 00	0 00	0 00	15 00	0 00	10 00	0 00	25 00	7 50	8 44	50 00
Elymus cinereus	15 00	0 00	0 00	10 00	5 00	0 00	0 00	20 00	15 00	20 00	8 50	8 08	60 00
COVER													
Total Living Cover	35 00	50 00	40 00	65 00	35 00	40 00	40 00	35 00	50 00	60 00	45 00	10 25	
Litter	5 00	5 00	5 00	5 00	5 00	5 00	5 00	5 00	5 00	25 00	7 00	6 00	
Bareground	50 00	20 00	25 00	25 00	30 00	30 00	35 00	35 00	25 00	5 00	28 00	11 00	
Rock	10 00	25 00	30 00	5 00	30 00	25 00	20 00	25 00	20 00	10 00	20 00	8 37	
% COMPOSITION													
Shrubs	28 57	40 00	37 50	30 77	71 43	37 50	75 00	14 29	10 00	0 00	34 51	23 02	
Forbs	28 57	20 00	12 50	38 46	14 29	25 00	0 00	0 00	20 00	25 00	18 38	11 52	
Grasses	42 86	40 00	50 00	30 77	14 29	37 50	25 00	85 71	70 00	75 00	47 11	21 90	

Reclaimed Mine Site Gordon Creek 3 & 6 Area A = 1 thru 10

"A" thru "H" Combined

ple Date: 28 Aug 1995

	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00
TREES & SHRUBS									
Rosa woodsii	20.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Chrysothamnus nauseosus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Symphoricarpos oreophilus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00	0.00
Artemisia tridentata	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ceratoides lanata	0.00	0.00	0.00	0.00	0.00	0.00	10.00	0.00	0.00
Kochia prostrata	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Artemisia nova	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Atriplex canescens	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Eriogonum corymbosum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gutierrezia sarothrae	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FORBS									
Aster foliaceus	0.00	20.00	0.00	0.00	5.00	0.00	0.00	0.00	20.00
Machaeranthera canescens	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Polygonum aviculare	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Eriogonum sp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Lactuca serriola	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Melilotus officinalis	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Medicago sativa	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hedysarum boreale	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Kochia scoparia	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ola pestifer	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
eranthera grindelioides	0.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cynoglossum officinale	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grindelia squarrosa	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Epilobium halleanum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GRASSES									
Poa pratensis	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Elymus lanceolatus	35.00	20.00	0.00	10.00	0.00	5.00	0.00	10.00	0.00
Elymus cinereus	0.00	0.00	75.00	35.00	70.00	65.00	15.00	5.00	10.00
Elymus spicatus	0.00	0.00	0.00	20.00	0.00	0.00	25.00	35.00	30.00
Agropyron cristatum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bromus tectorum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Elymus hispidus	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bromus carinatus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Poa secunda	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
COVER									
Total Living Cover	60.00	45.00	75.00	65.00	75.00	70.00	50.00	60.00	60.00
Litter	5.00	5.00	5.00	5.00	15.00	20.00	10.00	10.00	10.00
Bareground	10.00	30.00	5.00	5.00	5.00	5.00	10.00	20.00	25.00
Rock	25.00	20.00	15.00	25.00	5.00	5.00	30.00	10.00	5.00
MPOSITION									
Shrubs	33.33	0.00	0.00	0.00	0.00	0.00	20.00	16.67	0.00
Forbs	0.00	55.56	0.00	0.00	6.67	0.00	0.00	0.00	33.33
Grasses	66.67	44.44	100.00	100.00	93.33	100.00	80.00	83.33	66.67

Area B = 11 thru 20

10.00	11.00	12.00	13.00	14.00	15.00	16.00	17.00	18.00	19.00	20.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	5.00	5.00	0.00	0.00	0.00	0.00	0.00	25.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	5.00	10.00	0.00	0.00	0.00	0.00
0.00	10.00	0.00	5.00	5.00	0.00	0.00	0.00	5.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	10.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	0.00
0.00	0.00	0.00	10.00	0.00	0.00	5.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	5.00	0.00	5.00	0.00	0.00
0.00	0.00	0.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	5.00	0.00	0.00	5.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15.00	0.00	5.00	20.00	0.00	0.00	0.00	10.00	15.00	40.00	0.00
10.00	15.00	0.00	0.00	0.00	40.00	20.00	40.00	0.00	0.00	0.00
0.00	10.00	25.00	0.00	40.00	15.00	10.00	0.00	0.00	0.00	40.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
50.00	50.00	50.00	50.00	45.00	65.00	50.00	50.00	50.00	45.00	45.00
5.00	10.00	10.00	10.00	20.00	15.00	20.00	15.00	20.00	10.00	20.00
35.00	10.00	10.00	20.00	10.00	5.00	5.00	10.00	10.00	30.00	20.00
10.00	30.00	30.00	20.00	25.00	15.00	25.00	25.00	20.00	15.00	15.00
0.00	10.00	10.00	0.00	0.00	0.00	0.00	0.00	50.00	0.00	11.11
50.00	40.00	20.00	50.00	11.11	15.38	40.00	0.00	20.00	11.11	0.00
50.00	50.00	70.00	50.00	88.89	84.62	60.00	100.00	30.00	88.89	88.89

Area C = 21 thru 30

21.00	22.00	23.00	24.00	25.00	26.00	27.00	28.00	29.00	30.00	31.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	5.00	10.00	0.00	0.00	0.00	15.00	10.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	25.00	40.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	30.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	5.00	15.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00
0.00	5.00	25.00	15.00	0.00	5.00	15.00	5.00	5.00	0.00	20.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20.00	5.00	0.00	20.00	10.00	0.00	25.00	0.00	5.00	0.00	5.00
10.00	20.00	35.00	10.00	0.00	10.00	10.00	25.00	25.00	10.00	20.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	5.00	0.00	10.00	0.00	0.00	0.00	5.00	0.00	0.00	0.00
40.00	35.00	60.00	55.00	70.00	65.00	50.00	40.00	40.00	40.00	60.00
10.00	5.00	5.00	20.00	5.00	10.00	10.00	5.00	5.00	5.00	10.00
15.00	50.00	5.00	10.00	5.00	5.00	20.00	10.00	20.00	20.00	15.00
35.00	10.00	30.00	15.00	20.00	20.00	20.00	45.00	35.00	35.00	15.00
0.00	0.00	0.00	0.00	42.86	76.92	0.00	0.00	0.00	37.50	16.67
25.00	14.29	41.67	27.27	42.86	7.69	30.00	25.00	25.00	37.50	41.67
75.00	85.71	58.33	72.73	14.29	15.38	70.00	75.00	75.00	25.00	41.67

Area D = 31 thru 40

32.00	33.00	34.00	35.00	36.00	37.00	38.00	39.00	40.00	41.00	42.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10.00	25.00	0.00	0.00	5.00	0.00	20.00	0.00	5.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	10.00	0.00	0.00	5.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	5.00	0.00	5.00	0.00	5.00	0.00	0.00	0.00	0.00	0.00
5.00	10.00	5.00	20.00	5.00	10.00	5.00	10.00	25.00	0.00	0.00
10.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25.00	0.00	20.00	0.00	30.00	10.00	0.00	0.00	0.00	0.00	10.00
0.00	0.00	5.00	5.00	0.00	5.00	25.00	60.00	0.00	25.00	10.00
0.00	15.00	0.00	20.00	0.00	0.00	0.00	0.00	10.00	15.00	20.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	5.00	0.00	0.00	5.00	0.00	0.00
50.00	55.00	45.00	50.00	40.00	40.00	50.00	70.00	45.00	50.00	40.00
5.00	10.00	5.00	10.00	5.00	5.00	10.00	10.00	20.00	10.00	30.00
30.00	15.00	20.00	10.00	20.00	15.00	20.00	10.00	20.00	5.00	20.00
15.00	20.00	30.00	30.00	35.00	40.00	20.00	10.00	15.00	35.00	10.00
20.00	45.45	11.11	0.00	12.50	0.00	40.00	0.00	11.11	20.00	0.00
30.00	27.27	33.33	50.00	12.50	50.00	10.00	14.29	55.56	0.00	0.00
50.00	27.27	55.56	50.00	75.00	50.00	50.00	85.71	33.33	80.00	100.00

Area E = 41 thru 50

43.00	44.00	45.00	46.00	47.00	48.00	49.00	50.00	51.00	52.00	53.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15.00	15.00	0.00	0.00	0.00	25.00	20.00	15.00	0.00	0.00	0.00
0.00	0.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10.00	0.00	5.00	5.00	0.00	0.00	5.00	0.00	15.00	15.00	10.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00

10.00	0.00	0.00	0.00	10.00	10.00	0.00	0.00	25.00	5.00	0.00
0.00	0.00	0.00	10.00	0.00	0.00	10.00	0.00	5.00	20.00	5.00
15.00	25.00	25.00	15.00	35.00	10.00	10.00	25.00	5.00	5.00	0.00
0.00	10.00	15.00	5.00	10.00	0.00	0.00	15.00	0.00	0.00	5.00
0.00	0.00	0.00	0.00	0.00	5.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

50.00	50.00	55.00	50.00	65.00	50.00	45.00	55.00	50.00	45.00	45.00
20.00	15.00	25.00	10.00	20.00	10.00	30.00	10.00	5.00	5.00	10.00
20.00	25.00	10.00	10.00	5.00	35.00	15.00	15.00	40.00	25.00	25.00
10.00	10.00	10.00	30.00	10.00	5.00	10.00	20.00	5.00	25.00	20.00

30.00	30.00	18.18	20.00	15.38	50.00	44.44	27.27	0.00	0.00	33.33
20.00	0.00	9.09	20.00	0.00	0.00	11.11	0.00	30.00	33.33	44.44
50.00	70.00	72.73	60.00	84.62	50.00	44.44	72.73	70.00	66.67	22.22

Area F = 51 thru 60

54.00	55.00	56.00	57.00	58.00	59.00	60.00	61.00	62.00	63.00	64.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	0.00	0.00	10.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00	0.00	0.00

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	5.00	5.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20.00	5.00	0.00	5.00	5.00	5.00	15.00	5.00	5.00	0.00	5.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

10.00	10.00	10.00	0.00	0.00	0.00	0.00	0.00	5.00	0.00	5.00
5.00	5.00	10.00	0.00	25.00	25.00	0.00	10.00	0.00	0.00	0.00
5.00	10.00	20.00	15.00	10.00	10.00	10.00	10.00	20.00	30.00	25.00
0.00	0.00	5.00	20.00	15.00	0.00	20.00	20.00	0.00	20.00	10.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

50.00	40.00	50.00	45.00	55.00	40.00	45.00	50.00	40.00	50.00	55.00
5.00	5.00	5.00	10.00	10.00	10.00	20.00	5.00	10.00	15.00	10.00
20.00	30.00	20.00	25.00	10.00	25.00	20.00	25.00	25.00	25.00	15.00
25.00	25.00	25.00	20.00	25.00	25.00	15.00	20.00	25.00	10.00	20.00

20.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00	25.00	0.00	18.18
40.00	37.50	10.00	22.22	9.09	12.50	33.33	10.00	12.50	0.00	9.09
40.00	62.50	90.00	77.78	90.91	87.50	66.67	80.00	62.50	100.00	72.73

Area G = 61 thru 70

Area G = 70 thru 80

65.00	66.00	67.00	68.00	69.00	70.00	71.00	72.00	73.00	74.00	75.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5.00	0.00	0.00	0.00	0.00	0.00	0.00	20.00	10.00	10.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	10.00	0.00	0.00	0.00	10.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00	0.00

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	0.00	5.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	5.00	0.00	0.00	0.00	0.00
0.00	0.00	5.00	0.00	5.00	0.00	5.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	25.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

0.00	0.00	0.00	0.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00
10.00	0.00	20.00	5.00	10.00	30.00	0.00	10.00	15.00	0.00	0.00
20.00	60.00	40.00	50.00	25.00	10.00	15.00	0.00	0.00	10.00	5.00
15.00	0.00	0.00	5.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00	5.00	10.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

50.00	60.00	65.00	60.00	55.00	40.00	35.00	50.00	40.00	65.00	35.00
10.00	10.00	5.00	20.00	10.00	5.00	5.00	5.00	5.00	5.00	5.00
20.00	10.00	20.00	10.00	15.00	35.00	50.00	20.00	25.00	25.00	30.00
20.00	20.00	10.00	10.00	20.00	20.00	10.00	25.00	30.00	5.00	30.00

10.00	0.00	0.00	0.00	0.00	0.00	28.57	40.00	37.50	30.77	71.43
0.00	0.00	7.69	0.00	9.09	0.00	28.57	20.00	12.50	38.46	14.29
90.00	100.00	92.31	100.00	90.91	100.00	42.86	40.00	50.00	30.77	14.29

Reclaimed Mine Site
Area "A" thru "H" Combined
Sample Date: 28 Aug 1995

76.00	77.00	78.00	79.00	80.00	Mean	SDev	Freq	
								TREES & SHRUBS
0.00	0.00	0.00	0.00	0.00	0.25	2.22	1.25	Rosa woodsii
10.00	10.00	5.00	0.00	0.00	2.81	5.75	26.25	Chrysothamnus nauseosus
0.00	0.00	0.00	0.00	0.00	0.13	1.11	1.25	Symphoricarpos oreophilus
5.00	20.00	0.00	5.00	0.00	1.75	5.92	13.75	Artemisia tridentata
0.00	0.00	0.00	0.00	0.00	0.19	1.24	2.50	Ceratoides lanata
0.00	0.00	0.00	0.00	0.00	1.56	4.78	11.25	Kochia prostrata
0.00	0.00	0.00	0.00	0.00	0.13	1.11	1.25	Artemisia nova
0.00	0.00	0.00	0.00	0.00	0.13	1.11	1.25	Atriplex canescens
0.00	0.00	0.00	0.00	0.00	0.13	1.11	1.25	Eriogonum corymbosum
0.00	0.00	0.00	0.00	0.00	0.25	1.56	2.50	Gutierrezia sarothrae
								FORBS
0.00	0.00	0.00	0.00	0.00	1.13	4.68	7.50	Aster foliaceus
5.00	0.00	0.00	0.00	5.00	1.38	2.85	21.25	Machaeranthera canescens
0.00	0.00	0.00	0.00	0.00	0.06	0.56	1.25	Polygonum aviculare
0.00	0.00	0.00	0.00	0.00	0.06	0.56	1.25	Eriogonum sp.
0.00	0.00	0.00	0.00	5.00	0.06	0.56	1.25	Lactuca serriola
0.00	0.00	0.00	0.00	0.00	0.69	2.05	11.25	Melilotus officinalis
5.00	0.00	0.00	0.00	0.00	4.50	6.25	47.50	Medicago sativa
0.00	0.00	0.00	0.00	0.00	0.13	1.11	1.25	Hedysarum boreale
0.00	0.00	0.00	10.00	0.00	0.19	1.24	2.50	Kochia scoparia
0.00	0.00	0.00	0.00	0.00	0.31	2.78	1.25	Salsola pestifer
0.00	0.00	0.00	0.00	0.00	0.06	0.56	1.25	Machaeranthera grindelioides
0.00	0.00	0.00	0.00	0.00	0.44	2.87	3.75	Cynoglossum officinale
0.00	0.00	0.00	0.00	0.00	0.06	0.56	1.25	Grindelia squarrosa
0.00	0.00	0.00	0.00	5.00	0.31	1.21	6.25	Epilobium halleanum
								GRASSES
0.00	0.00	0.00	0.00	0.00	1.31	3.85	12.50	Poa pratensis
15.00	0.00	10.00	0.00	25.00	7.00	9.73	47.50	Elymus lanceolatus
0.00	0.00	20.00	15.00	20.00	15.63	17.47	47.50	Elymus cinereus
0.00	0.00	0.00	0.00	0.00	8.81	10.79	51.25	Elymus spicatus
0.00	0.00	0.00	0.00	0.00	0.06	0.56	1.25	Agropyron cristatum
0.00	10.00	0.00	20.00	0.00	0.75	2.97	7.50	Bromus tectorum
0.00	0.00	0.00	0.00	0.00	0.06	0.56	1.25	Elymus hispidus
0.00	0.00	0.00	0.00	0.00	0.06	0.56	1.25	Bromus carinatus
0.00	0.00	0.00	0.00	0.00	0.38	1.54	6.25	Poa secunda
								COVER
40.00	40.00	35.00	50.00	60.00	50.75	9.56		Total Living Cover
5.00	5.00	5.00	5.00	25.00	10.56	8.37		Litter
30.00	35.00	35.00	25.00	5.00	18.69	10.36		Bareground
25.00	20.00	25.00	20.00	10.00	20.00	9.01		Rock
								% COMPOSITION
37.50	75.00	14.29	10.00	0.00	14.78	19.14		Shrubs
25.00	0.00	0.00	20.00	25.00	18.99	16.51		Forbs
37.50	25.00	85.71	70.00	75.00	66.24	23.76		Grasses

BLACKHAWK

[illegible]don Creek 3 & 6

[illegible]rence Area Sagebrush/Grass

Exposure: E

Slope: 36 deg.

Sample Date: 24 Aug 1995	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00	11.00	12.00	13.00	14.00	15.00
TREES & SHRUBS															
Artemisia nova	5.00	10.00	30.00	5.00	15.00	35.00	20.00	10.00	25.00	10.00	5.00	5.00	0.00	15.00	20.00
Cercocarpos montanus	0.00	5.00	0.00	0.00	5.00	0.00	5.00	0.00	0.00	0.00	0.00	0.00	5.00	0.00	0.00
Gutierrezia sarothrae	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	0.00	0.00	0.00
Eriogonum corymbosum	0.00	0.00	0.00	25.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00	0.00	0.00	0.00
Chrysothamnus depressus	0.00	5.00	0.00	0.00	5.00	0.00	0.00	0.00	0.00	5.00	0.00	0.00	0.00	0.00	0.00
FORBS															
Hedysarum boreale	5.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	35.00	10.00	5.00	5.00	5.00
Astragalus mollissimus	5.00	5.00	0.00	0.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asclepias sp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Machaeranthera grindelioides	5.00	0.00	0.00	0.00	0.00	0.00	5.00	5.00	0.00	5.00	0.00	0.00	0.00	5.00	0.00
[illegible]SSES															
[illegible]ipa hymenoides	0.00	0.00	0.00	0.00	0.00	0.00	10.00	3.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Elymus salinus	15.00	10.00	25.00	20.00	10.00	20.00	10.00	10.00	15.00	15.00	15.00	15.00	25.00	15.00	10.00
COVER															
Total Living Cover	35.00	45.00	55.00	50.00	40.00	55.00	50.00	30.00	40.00	35.00	55.00	45.00	35.00	40.00	35.00
Litter	5.00	10.00	10.00	25.00	5.00	25.00	10.00	5.00	5.00	10.00	10.00	10.00	5.00	10.00	10.00
Bareground	35.00	25.00	25.00	15.00	20.00	5.00	20.00	5.00	10.00	25.00	10.00	10.00	30.00	10.00	20.00
Rock	25.00	20.00	10.00	10.00	35.00	15.00	20.00	60.00	45.00	30.00	25.00	35.00	30.00	40.00	35.00
% COMPOSITION															
Shrubs	14.29	44.44	54.55	60.00	62.50	63.64	50.00	33.33	62.50	42.86	9.09	44.44	14.29	37.50	57.14
Forbs	42.86	33.33	0.00	0.00	12.50	0.00	10.00	23.33	0.00	14.29	63.64	22.22	14.29	25.00	14.29
Grasses	42.86	22.22	45.45	40.00	25.00	36.36	40.00	43.33	37.50	42.86	27.27	33.33	71.43	37.50	28.57

16.00	17.00	18.00	19.00	20.00	21.00	22.00	23.00	24.00	25.00	26.00	27.00	28.00	29.00	30.00	Mean	SDev	Freq
0.00	25.00	20.00	5.00	20.00	25.00	35.00	20.00	20.00	5.00	20.00	15.00	20.00	20.00	15.00	15.83	9.41	100.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	30.00	0.00	0.00	0.00	0.00	0.00	1.67	5.53	16.67
0.00	0.00	0.00	5.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	0.00	5.00	1.00	2.38	16.67
25.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	6.40	10.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	1.50	10.00
0.00	0.00	5.00	0.00	5.00	0.00	10.00	0.00	0.00	0.00	10.00	5.00	0.00	5.00	0.00	3.83	6.79	43.33
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	1.50	30.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.36	3.33
5.00	0.00	0.00	0.00	0.00	5.00	0.00	5.00	5.00	0.00	5.00	0.00	5.00	0.00	0.00	1.83	2.41	36.64
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.43	1.86	6.67
10.00	20.00	25.00	20.00	15.00	10.00	10.00	5.00	15.00	5.00	15.00	20.00	5.00	15.00	35.00	15.17	6.64	100.00
40.00	45.00	50.00	30.00	50.00	40.00	55.00	30.00	40.00	40.00	50.00	40.00	35.00	40.00	55.00	42.83	7.92	
10.00	10.00	20.00	5.00	10.00	5.00	5.00	5.00	10.00	20.00	5.00	10.00	15.00	10.00	10.00	10.17	5.55	
20.00	20.00	15.00	5.00	20.00	30.00	20.00	10.00	35.00	20.00	5.00	25.00	25.00	15.00	25.00	18.50	8.58	
30.00	25.00	15.00	60.00	20.00	25.00	20.00	55.00	15.00	20.00	40.00	25.00	25.00	35.00	10.00	28.50	13.43	
62.50	55.56	40.00	33.33	60.00	62.50	63.64	66.67	50.00	87.50	40.00	37.50	71.43	50.00	36.36	48.92	17.32	
12.50	0.00	10.00	0.00	10.00	12.50	18.18	16.67	12.50	0.00	30.00	12.50	14.29	12.50	0.00	14.58	13.96	
25.00	44.44	50.00	66.67	30.00	25.00	18.18	16.67	37.50	12.50	30.00	50.00	14.29	37.50	63.64	36.50	14.34	

MOUNTAIN COAL COMPANY

GORDON CREEK NO. 3/6 MINES

PHASE III BOND RELEASE

Post Mining Land Use

Post Mining Land Use

The post-mining land use for the Gordon Creek No. 3/6 Mines is grazing and wildlife habitat.

***The detailed vegetation information provided in the previous section will confirm** that the approved post-mining land use has been achieved form a vegetation standpoint.*

Permanent sediment ponds have been left in place on the site to maximize water retention for both stock and wildlife.

MOUNTAIN COAL COMPANY

GORDON CREEK NO. 3/6 MINES

PHASE III BOND RELEASE

Subsidence Information

Subsidence Monitoring

A subsidence monitoring network was set up over the mine area in July, 1986. The network consisted of 2 control stations and 6 monitoring stations. The stations have been monitored yearly from 1986. In addition, the area above the minesite is checked for any visible signs of subsidence.

The attached report will show that actual measured subsidence at the monitoring points has been less than 0.40 feet, and over the last 3 years, has been beyond normal limits of detection (less than 0.01'). There has been no visible evidence of movement, cracks or other subsidence effects noted since 1986. Nor has there been any subsidence-caused material damage.

Locations of monitoring points are shown on the mine maps included in the following section.

SUBSIDENCE MONITORING REPORT

MOUNTAIN COAL COMPANY
SUBSIDENCE MONITORING
GORDON CREEK NO. 3/6 MINE

STATION	ORIGINAL ELEVATION 07/30/86	SURVEY ELEVATION 11/04/94	SURVEY ELEVATION 11/25/95	SURVEY ELEVATION 10/20/96	CHANGE LAST	CHANGE ACCUMULATED
"O"	7577.760	7577.760	7577.760	7577.760	CONTROL	CONTROL
"N"	7892.180	7892.180	7892.180	7892.180	CONTROL	CONTROL
SUB-1	8269.400	8269.330	8269.330	8269.330	0.000	-0.070
SUB-2	8107.430	8107.175	8107.180	8107.180	0.000	-0.250
SUB-3	8502.610	8502.478	8502.470	8502.475	0.005	-0.135
SUB-4	8308.580	8308.639	8308.650	8308.650	0.000	0.070
SUB-5	8512.470	8512.111	8512.110	8512.093	-0.017	-0.377
SUB-6	8412.570	8412.245	8412.250	8412.253	0.003	-0.317

NOTE: *(1)* *THE AREA WAS WALKED BETWEEN ALL STATIONS. NO VISIBLE MOVEMENT, CRACKS OR OTHER RECENT SUBSIDENCE EFFECTS WERE NOTED DURING THE SURVEY.*

REGISTERED PROFESSIONAL ENGINEER
DAN W. GUY
No. 154168
11/1/96
STATE OF UTAH

MOUNTAIN COAL COMPANY

GORDON CREEK NO. 3/6 MINES

PHASE III BOND RELEASE

Final Mine Map