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In C/015/0017, 2001, Incoming
For additional information Confidential

COTTONWOOD MINE
C/015/019

DEER CREEK MINE
C/015/018

DES-BEE-DOVE MINES
C/015/017

TRAIL MOUNTAIN MINE
C/015/009

Energy West Mining Co.

Annual Vegetation Monitoring Report-2000

Pacificorp Vegetation Monitoring Notes

Cottonwood Old Fan Road could be candidate for Bond Release

not necessarily a problem

Storage Yard Slope – Part has mostly weeds or little cover

Parking lot slope – Mostly weeds because of rock erosion control

Road/Silo Pad Slope – Active w/ mining so vegetation was stable

Tipple Slope " " " " " "

TEST Plots – Separate Report

Waste Rock Cells – Took Quantitative in 1999 for Bond Release – Did they also take it in 1998?

* Waste Rock Cell 5 was reseeded in 1993 – Part of the area weedy.

Cell 6 Reseeded in 93

7 Part " " "

Waste Rock Berm – Some disturbed by gas companies

Subsoil Stock – Some erosion on north end – should they do some remediation?

Refuse berms – 91 & 94, not 96 – showing some erosion that they hadn't previously had.

finished CWW.

As you write about the problems, emphasize that doing the monitoring allows Energy West to know what problems they have and how they can fix them. Not just problems so the Division can cause problems.

In general, those areas that get redistributed tend to have more weeds, but it's not necessarily a problem.

Dee Bee — Dee Bee sediment storage slope has grasses not noted in 1999

Dee Bee sediment pond slopes dominated by rabbitbrush - Is this a concern for bank stability? → Don't say anything - it's a lot of LHNA

Subsoil/Topsoil pile had cicer on top and more cover on top than on the sides.

→ The embankment is thick enough I don't think the rabbitbrush will cause a problem

→ Was cicer in the seed mix? Did it just take a couple of years to come up?

Deer Creek — Patrick was not able to find anything marking the P-J reference area - It should have T-posts or something. He thought he got to the ~~site~~ actual site, and he did it using an aerial photo

Phase I berm in Deer Creek waste rock area might need some spot seeding - ~~some~~ south facing slopes - Biologist should visit when in the area and make recommendation

Halogeton is second only to IRG

Phase I Diversion may need hand release criteria - Is it up for hand release?

Trail Mtn. Cottonwood Canyon — Grass Shrub Reference Area - Only found 1 Marker. Fan Portal (181)

Through pg 160

ENERGY WEST MINING COMPANY
VEGETATION MONITORING

2000

VEGETATION MONITORING REPORTS FOR THE
COTTONWOOD MINE, DES-BEE-DOVE, DEER CREEK MINE,
TRAIL MOUNTAIN MINE, COTTONWOOD CANYON & RILDA CANYON

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REPORT DATE
MARCH 2001

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INTRODUCTION

The following document addresses the results of vegetation monitoring of seeded areas and revegetation test plots results for 2000. The following is a list of areas monitored and reported within this document.

Cottonwood Mine Area

Old Fan Road
Reference Area
4th East Road
Storage Yard Slope
Parking Lot Slope
Road/Silo Pad Slope
Tipple Area Slopes
Sediment Pond Banks
Ninth East Road Breakout
Test Plots '88
Waste Rock (Old) Cell 1
Waste Rock (Old) Cell 2
Waste Rock (Old) Cell 3
Waste Rock (Old) Cell 4
Waste Rock (Old) Cell 5
Waste Rock (Old) Cell 6
Waste Rock (Old) Cell 7
Waste Rock (Old) Berm 1
Waste Rock (Old) Berm 2
Waste Rock (Old) Berm 3
Waste Rock (Old) Berm 4
CTW Reference Area
CTW Soil Piles (A,C) '94
Waste Rock (New) Road Slopes
Waste Rock (New) Topsoil Stockpiles
Waste Rock (New) Subsoil Stockpiles
Waste Rock (New) Sediment Pond Banks
Refuse Berm 1991 (Final)
Refuse Berm 1994 (Final)
Refuse Berm 1996 (Final)

Des-Bee-Dove Area

Beehive Yard Slope
Beehive Road Berm
Deseret Road Berm
Portal Road Berm
Bathhouse Road Berm
Tipple Slope
Sediment Storage Slope
Sediment Pond Banks
Beehive Substation Slope
Sediment Pond Area
Bathhouse Slope
Material Yard Slope
Test Plots '89
Beehive Slope
Subsoil Pile

Deer Creek

Riparian Reference Area
Mixed Conifer Reference Area
PJ Reference Area
C2 Conveyor (IU 132-190)'93
Riparian Areas
Sediment Pond Dam
Temp. Sediment Basin
Roadside Areas
Gate Areas Slope
Fan Road Slopes
Refuse Pile and Berm
Rock Slide and Berm
Water Plant Slope
Pipeline
Deer Canyon
Waste Rock Atriplex Reference Area
Waste Rock Access Road Slopes
Phase I Berm
Drain Field '97
Phase I Diversion

Trail Mountain Mine

Reference Area
Sediment Pond Outslope '93
Parking Lot Ext.'96

Cottonwood Canyon

Reclaimed Slope
Soil Piles
Reference Area
CFP Tube Conveyor Slope
Belt Portal
Portal (Diesel)
Reclaimed Slope (Final) '98

Rilda Facilities Area

Pad Area Slopes '96
Roadway Slopes
Topsoil Pile '95

METHODS

Vegetation monitoring was conducted on revegetated sites and test plots for ENERGY WEST in the growing season of 2000. Quantitative and/or qualitative data were taken on each site, depending on the monitoring schedule. In other words, quantitative data sampling was not scheduled this year on some sites. Each data sheet will briefly describe the sample parameters specific to that site.

QUALITATIVE DATA

Qualitative data were recorded on all sites. A qualitative data sheet for each site is included in this report and provides the following information: site name, general area, sample date, observers, slope, exposure, acreage, animal disturbance, erosion damage, cover, dominant plant species observed, and other pertinent notes.

When quantitative data were recorded, results are shown on these data sheets or reference to where the data is located.

Site Name

The site name that is given correlates with ENERGY WEST'S maps of the area and can be used for future reference and sampling.

Area

The "Area" on the data sheets is a reference to the general mine or property areas for quick reference and general use.

Date

Sample dates are also provided. All sample dates are within the 2000 growing season.

Workers

Lists the names of the individuals who recorded the data.

Exposure

Exposure was recorded on each site. Often the site had several exposure differences. In those cases, "variable" was written for the exposure on the data sheet.

Animal Disturbance

Values were given to the relative use by animal species at each site. The values and a brief explanation are given below.

None -	no animal use was observed.
Slight -	only little animal use was observed by droppings, tracks, or cropped vegetation.
Moderate -	a fair degree of use was observed, mostly by the cropped vegetation. Several inches of production still remained available for use by the animals.
Severe -	animal use had taken nearly all of the available current year's production.

Erosion

Erosion of the area was also assessed by qualitative methods. Actual measurements, descriptive notes or values described below were given to each site.

None -	(or negligible) no erosion was observed.
Slight -	small erosion rills beginning, usually less than 2:1 (2 inches wide by 1 inches deep).
Moderate -	erosional rills and gullies from 2:1 to 4:2.
Severe -	erosional rills and gullies over to 4:2 were observed.

Cover

Cover differences or notes may be given on the data sheet or references to the quantitative data.

Dominant Plant Species Observed

Sometimes plant species that were observed, but were not encountered in the quadrats when sampling. Many of these species were recorded here. However, some of the species were also encountered in the quadrats. Therefore, for a list of all species on a given site, one should refer to both quantitative and qualitative data sheets.

Notes

Site-specific, pertinent notes about each area were also taken i.e. identification of special

considerations, areas of differential growth patterns, etc. Notes on specific methodologies on each site were also described here.

Photographs

Color photographs were taken for each site and are included in this report for documentation.

QUANTITATIVE DATA

Cover and Composition

Cover estimates were made using ocular methods with randomly or regularly placed meter square quadrats. Total living cover, litter, rock and bareground were recorded. Cover by species was also recorded. Raw data summations were included in this report. They provide all means and standard deviations. Species composition was also assessed from the quadrats. Sample sizes were often kept consistent each year. Because these data are presented to observe only trends for revegetation success and soil stabilization, no attempt was made to achieve sample adequacy for each individual site.

Woody Species Density

In some areas woody plant densities estimates were needed. Densities were recorded using the point-quarter distance method (Cottom and Curtis 1956), belt transects, or in some cases, counting the entire population of a given area. In the point-quarter method, random points were placed on the sample sites and measured into four quarters. The distances to the nearest woody plant species were then recorded in each quarter. The average point-to-individual distance was equal to the square root of the mean area per individual.

In the belt transect method, sizes of transects varied with individual sites. In this method total counts of the woody species were conducted in each transect. They were then summed and averaged to calculate the number of individuals per acre.

Productivity

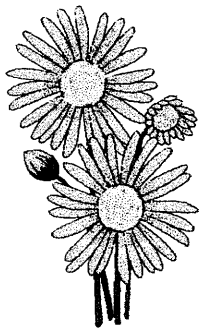
Total annual biomass was estimated by clipping, drying and weighing current annual productivity. When there was enough space within the sample area, “double sampling” or relative ocular estimates were also made placing four quadrats near the "clipped" quadrat to increase accuracy of the productivity estimates. In other words, one quadrat was placed. From this sample, four more quadrat estimates were made relative to the first quadrat. Biomass from the first quadrat was clipped and weighed.

RESULTS

To be consistent with previous years, data sheets for qualitative and quantitative (including raw data) sampling are included in this report. This gives the reviewer an overall view of the revegetation success of each area. For results of the above parameters, refer to the site-specific data sheets.

In addition to this report, a "close-out" meeting was conducted by representatives of *Mt. Nebo Scientific, Inc.* and *Energy West Mining Company* at the end of the sample season 2000. This meeting was conducted to summarize the findings of the sample year.

COTTONWOOD MINE AREA



ENERGY WEST MINING COMPANY
QUALITATIVE SAMPLING DATA SHEET AND
QUANTITATIVE/QUALITATIVE NOTES
2000

SITE NAME: Old Fan Road

AREA: Cottonwood Mine (1984)

DATE: August 28 - September 2, 2000

WORKERS: P. Collins, D. Collins

SLOPE: 13-15 deg.

EXPOSURE: Variable

AREA: .8 acres

ANIMAL USE/DISTURBANCE: Heavy deer sign.

EROSION: Negligible

COVER: (Cover not sampled this year).

DOMINANT PLANT SPECIES OBSERVED:
Artemisia tridentata
Atriplex confertifolia
Cercocarpus montanus
Chrysothamnus nauseosus
Eriogonum corymbosum
Gutierrezia sarothrae
Populus angustifolia
Ribes sp.
Salix exigua
Sambucus caerulea
Symphoricarpos oreophilus

Aster chilensis
Astragalus cicer
Cirsium sp.
Cynoglossum officinale
Linum lewisii
Machaeranthera canescens
Melilotus officinalis
Tragopogon dubius

Elymus cinereus
Elymus spicatus
Elymus junceus
Elymus lanceolatus

Elymus smithii
Elymus salinus
Stipa hymenoides

NOTES:

1) We sampled for qualitative data in 2000.
2) Revegetation site looked excellent.
3) Cover, density and diversity looked very good.
4) A few areas had lower diversity and were comprised mainly of grasses and aster.
5) A few thistles were noted, but were not musk thistle.
6) Final could be candidate for bond release (~).

ENERGY WEST MINING COMPANY
QUALITATIVE SAMPLING DATA SHEET AND
QUANTITATIVE/QUALITATIVE NOTES
2000

SITE NAME: Reference Area

AREA: Cottonwood Mine

DATE: August 28 - September 2, 2000

WORKERS: P. Collins, D. Collins

SLOPE: 36 deg.

EXPOSURE: NE

ANIMAL USE/DISTURBANCE: Minimal

EROSION: Negligible

COVER: (Cover not sampled this year)

DOMINANT PLANT SPECIES OBSERVED:

Abies concolor
Amalanchier utahensis
Artemisia tridentata

Chrysothamnus depressus
Chrysothamnus nauseosus
Ephedra viridis
Eriogonum corymbosum
Gutierrezia sarothrae
Juniperus osteosperma
Pinus edulis
Pseudotsuga menziesii
Rosa woodsii
Symphoricarpos oreophilus

Hedysarum occidentale var. canone
Galium boreale
Leptodactylon watsonii

Elymus salinus
Stipa hymenoides

NOTES:
1) Sampled for qualitative data in 2000.
2) No major disturbance has disrupted this site.

ENERGY WEST MINING COMPANY
QUALITATIVE SAMPLING DATA SHEET AND
QUANTITATIVE/QUALITATIVE NOTES
2000

SITE NAME: 4th East Road

AREA: Cottonwood Mine (1986)

DATE: August 28 - September 2, 2000

WORKERS: P. Collins, D. Collins

SLOPE: 3 - 5 degrees

EXPOSURE: N

AREA: .1 acre

ANIMAL USE/DISTURBANCE:

EROSION: Negligible

COVER: (Cover not sampled this year) .

DOMINANT PLANT SPECIES OBSERVED:

Gutierrezia sarothrae

Aster chilensis
Medicago sativa

Elymus cinereus
Elymus lanceolatus
Elymus smithii

NOTES:
1) We sampled for qualitative data this year.
2) Excellent grass cover with very few shrubs.
3) Site looked similar to last year.

ENERGY WEST MINING COMPANY
QUALITATIVE SAMPLING DATA SHEET AND
QUANTITATIVE/QUALITATIVE NOTES
2000

SITE NAME: Storage Yard Slope

AREA: Cottonwood Mine (1988 Reveg. Area)

DATE: August 28 - September 2, 2000

WORKERS: P. Collins, D. Collins

SLOPE: 30 - 40 deg.

EXPOSURE: S & E

AREA: 1.3 acres

ANIMAL USE/DISTURBANCE:

EROSION: Mostly moderate.

COVER: (Cover not sampled this year)

DOMINANT PLANT SPECIES OBSERVED:

Chrysothamnus nauseosus
Gutierrezia sarothrae

Aster chilensis
Kochia scoparia
Penstemon palmeri

Agropyron cristatum
Elymus cinereus
Elymus lanceolatus
Elymus smithii
Stipa hymenoides
Hordeum jubatum

NOTES:

1) Sampled for qualitative data only.

2) As mentioned last year, some sections on the East exposure a had little or no cover and supported mostly weedy species, whereas, the south face has a fair representation of native species (~).

ENERGY WEST MINING COMPANY
QUALITATIVE SAMPLING DATA SHEET AND
QUANTITATIVE/QUALITATIVE NOTES
2000

SITE NAME: Parking Lot Slope

AREA: Cottonwood Mine

DATE: August 28 - September 2, 2000

WORKERS: P. Collins, D. Collins

SLOPE: 26 deg.

EXPOSURE: E

ANIMAL USE/DISTURBANCE:

EROSION: Slight to moderate, but controlled by rocks.

COVER: (Cover not sampled this year)

DOMINANT PLANT SPECIES OBSERVED:

Chrysothamnus nauseosus
Atriplex confertifolia

Aster chilensis
Elymus cinereus
Elymus lanceolatus
Elymus hispidus
Hordeum jubatum
Kochia scoparia
Grindelia squarrosa
Stipa hymenoides

NOTES:

1) Sampled for qualitative data.

2) Mostly weedy species because of erosion control measures (½-inch-plus rock cover) disturbed existing vegetation.

ENERGY WEST MINING COMPANY
QUALITATIVE SAMPLING DATA SHEET AND
QUANTITATIVE/QUALITATIVE NOTES
2000

SITE NAME: Road/Silo Pad Slope

AREA: Cottonwood Mine (1988 Reveg. Area)

DATE: August 28 - September 2, 2000

WORKERS: P. Collins, D. Collins

SLOPE: 35 deg.

EXPOSURE: SE

ACREAGE: 1.4 acre

ANIMAL USE/DISTURBANCE: Negligible

EROSION: Moderate (see notes)

COVER: (Cover not sampled this year)

DOMINANT PLANT SPECIES OBSERVED:

Atriplex confertifolia
Chrysothamnus nauseosus
Eriogonum corymbosum

Aster chilensis
Grindelia grindelioides
Penstemon palmeri
Halogeton glomeratus
Kochia scoparia
Melilotus officinalis

Elymus cinereus
Elymus hispidus
Elymus lanceolatus
Elymus salinus
Elymus spicatus

NOTES: 1) Area was active with mine activity and constantly under change. The plant growth is unstable (~).

ENERGY WEST MINING COMPANY
QUALITATIVE SAMPLING DATA SHEET AND
QUANTITATIVE/QUALITATIVE NOTES
2000

SITE NAME: Tipple Area Slope

AREA: Cottonwood Mine (1988 Reveg. Area)

DATE: August 28 - September 2, 2000

WORKERS: P. Collins, D. Collins

SLOPE: 35 deg.

EXPOSURE: Variable

AREA: .1 acre

ANIMAL USE/DISTURBANCE: none

EROSION: Some moderate erosion on north side of the road.

COVER: (Cover not sampled this year) .

DOMINANT PLANT SPECIES OBSERVED:

Atriplex confertifolia
Eriogonum corymbosum

Aster chilensis

Elymus lanceolatus
Elymus smithii
Elymus junceus
Stipa hymenoides

NOTES:

1) Sampled for qualitative data only this year.

2) Area was still active constantly changing and therefore, unstable for plant growth. It's a difficult place for desirable spp. to become established.(~).

ENERGY WEST MINING COMPANY
QUALITATIVE SAMPLING DATA SHEET AND
QUANTITATIVE/QUALITATIVE NOTES
2000

SITE NAME: Sediment Pond Banks

AREA: Cottonwood Mine (1988 Reveg. Area)

DATE: August 28 - September 2, 2000

WORKERS: P. Collins, D. Collins

SLOPE: 35 deg.

EXPOSURE: Variable

AREA: .9 acre

ANIMAL USE/DISTURBANCE:

EROSION: Slight

COVER: (Cover not sampled this year)

DOMINANT PLANT SPECIES OBSERVED:

Atriplex canescens
Chrysothamnus nauseosus
Eriogonum corymbosum

Aster chilensis
Convolvulus arvensis
Grindelia squarrosa
Halogeton glomeratus
Helianthus annuus
Kochia scoparia
Malcomia africana
Melilotus officinalis
Salsola pestifer

Agropyron cristatum
Bromus inermis
Elymus cinereus
Elymus elymoides
Elymus lanceolatus
Elymus smithii
Elymus spicatus
Stipa hymenoides

NOTES:

1) We sampled for qualitative data this year.

2) Patchy vegetation growth patterns with some desirable and some weedy species. This is due to erosion control and fluctuating water levels in ponds. (~).

3) Regular maintenance of ponds disturbs vegetation.

4) There was lots of material added around banks that disturbed the vegetation.

5) The cover looked good on ponds that had not been disturbed.

ENERGY WEST MINING COMPANY
QUALITATIVE SAMPLING DATA SHEET AND
QUANTITATIVE/QUALITATIVE NOTES
2000

SITE NAME: Ninth East Road Breakout

AREA: Cottonwood Mine (1988 Reveg. Area)

DATE: August 28 - September 2, 2000

WORKERS: P. Collins, D. Collins

SLOPE: Variable

EXPOSURE: Variable

ANIMAL USE/DISTURBANCE:

EROSION: Negligible, controlled well by plants

COVER: (Cover not sampled this year) .

DOMINANT PLANT SPECIES OBSERVED:

Artemisia tridentata
Atriplex canescens

Aster chilensis
Descurainia pinnata
Kochia scoparia
Linum lewisii

Cirsium sp.

Agropyron cristatum
Bromus inermis
Elymus lanceolatus
Elymus smithii

NOTES:

1) Qualitative data were taken in 2000.

20 Not a lot of cover (est. 5-10%) due to recent revegetation? (~).

2) Much of the cover consists of weedy species.

3) Erosion is being controlled by roughed ground techniques.

ENERGY WEST MINING COMPANY
QUALITATIVE SAMPLING DATA SHEET AND
QUANTITATIVE/QUALITATIVE NOTES
2000

SITE NAME: Test Plots '88

AREA: Cottonwood Mine

DATE: 2000

WORKERS: P. Collins, D. Collins

SLOPE: 35 deg.

EXPOSURE: E (S)

ANIMAL USE/DISTURBANCE:

EROSION:

NOTES: 1) No on-site data recorded 2000.

2) See separate report called:

SAMPLE RESULTS FOR
THE COTTONWOOD MINE
REVEGETATION TEST PLOTS

1991-1999

EXECUTIVE SUMMARY

ENERGY WEST MINING COMPANY
QUALITATIVE SAMPLING DATA SHEET AND
QUANTITATIVE/QUALITATIVE NOTES
2000

SITE NAME: Cell #1

AREA: Cottonwood Mine Old Waste Rock Area (1983 Interim Reveg)

DATE: August 28 - September 2, 2000

WORKERS: P. Collins, D. Collins

SLOPE: 0-1 deg.

EXPOSURE: E

ANIMAL USE/DISTURBANCE: slight to moderate

EROSION: Negligible

COVER: (Cover not sampled this year)

DOMINANT PLANT SPECIES OBSERVED:

Artemisia tridentata
Atriplex canescens
Chrysothamnus nauseosus
Cercocarpus montanus
Gutierrezia sarothrae

Agropyron cristatum
Elymus lanceolatus
Elymus smithii
Stipa hymenoides

NOTES:

1) Sampled qualitative data only this year.

2) However, in 1999 we sampled extensively for quantitative data.

3) A separate report was written and submitted to Energy West for this area for a potential bond release application.

ENERGY WEST MINING COMPANY
QUALITATIVE SAMPLING DATA SHEET AND
QUANTITATIVE/QUALITATIVE NOTES
2000

SITE NAME: Cell #2

AREA: Cottonwood Mine Old Waste Rock Area (1984 Interim Reveg)

DATE: August 28 - September 2, 2000

WORKERS: P. Collins, D. Collins

SLOPE: 0-1 deg.

EXPOSURE: E

AREA: ~ 1 acre

ANIMAL USE/DISTURBANCE:

EROSION: Negligible

COVER: (Cover not sampled this year)

DOMINANT PLANT SPECIES OBSERVED:

Atriplex canescens
Atriplex confertifolia
Gutierrezia sarothrae

Agropyron cristatum
Elymus lanceolatus
Elymus spicatus
Elymus hispidus
Elymus smithii
Hilaria jamesii
Sitanion hystrix
Stipa hymenoides
Stipa comata

NOTES:

1) Sampled qualitative data only in 2000.

2) However, in 1999 we sampled extensively for quantitative data. A separate report was written and submitted to Energy West for this area for a potential bond release application.

3) Plot looks excellent.

ENERGY WEST MINING COMPANY
QUALITATIVE SAMPLING DATA SHEET AND
QUANTITATIVE/QUALITATIVE NOTES
2000

SITE NAME: Cell #3

AREA: Cottonwood Mine Old Waste Rock Area (1985 Interim Reveg)

DATE: August 28 - September 2, 2000

WORKERS: P. Collins, D. Collins

SLOPE: 0-1 deg.

EXPOSURE: E

ANIMAL USE/DISTURBANCE: Slight

EROSION: Negligible

COVER: (Cover not sampled this year)

DOMINANT PLANT SPECIES OBSERVED:

Atriplex canescens
Gutierrezia sarothrae

Agropyron cristatum
Elymus lanceolatus
Hilaria jamesii
Sporobolus airoides
Stipa hymenoides
Stipa comata

NOTES:

1) Qualitative data was taken this year.

2) In 1999 we sampled extensively for quantitative data. A separate report was written and submitted to Energy West for this area for a potential bond release application.

3) *Stipa comata* appears to be increasing.

4) Condition: excellent.

ENERGY WEST MINING COMPANY
QUALITATIVE SAMPLING DATA SHEET AND
QUANTITATIVE/QUALITATIVE NOTES
2000

SITE NAME: Cell #4

AREA: Cottonwood Mine Old Waste Rock Area ('86 Interim Reveg)

DATE: August 28 - September 2, 2000

WORKERS: P. Collins, D. Collins

SLOPE: 0 - 1 deg

EXPOSURE: E

ANIMAL USE/DISTURBANCE: Moderate deer and rabbit use.

EROSION: negligible

COVER: (Cover not sampled this year)

DOMINANT PLANT SPECIES OBSERVED:

Gutierrezia sarothrae

Agropyron cristatum
Elymus spicatus
Elymus smithii
Elymus lanceolatus
Hilaria jamesii
Stipa comata
Stipa hymenoides

NOTES:

1) Qualitative sampling was taken in 2000.

2) There was good grass cover, but few forbs and shrubs.

3) In 1999 we sampled extensively for quantitative data. A separate report was written and submitted to Energy West for this area for a potential bond release application.

ENERGY WEST MINING COMPANY
QUALITATIVE SAMPLING DATA SHEET AND
QUANTITATIVE/QUALITATIVE NOTES
2000

SITE NAME: Cell #5 '89 (Reseeded) 93

AREA: Cottonwood Mine Old Waste Rock Area (Interim Reveg)

DATE: August 28 - September 2, 2000

WORKERS: P. Collins, D. Collins

SLOPE: 0-1 deg

EXPOSURE: E

ANIMAL USE/DISTURBANCE: Used by deer and rabbits mostly

EROSION: Negligible

COVER: (Cover not sampled this year)

DOMINANT PLANT SPECIES OBSERVED:

Atriplex canescens

Agropyron cristatum
Bromus tectorum
Elymus lanceolatus
Elymus smithii
Hordeum jubatum
Stipa comata

NOTES:

1) Sampled for qualitative data this year.

2) Site had good cover of shrubs and grasses, but few forbs.

3) In 1999 we sampled extensively for quantitative data. A separate report was written and submitted to Energy West for this area for a potential bond release application.

4) One area within the site was quite "weedy".

ENERGY WEST MINING COMPANY
QUALITATIVE SAMPLING DATA SHEET AND
QUANTITATIVE/QUALITATIVE NOTES
2000

SITE NAME: Cell #6 '89 (Reseeded) '93

AREA: Cottonwood Mine Waste Rock Area (Interim Reveg)

DATE: August 28 - September 2, 2000

WORKERS: P. Collins, D. Collins

SLOPE: 0-1 deg.

EXPOSURE: E

ANIMAL USE/DISTURBANCE: Used intensively by deer and rabbits.

EROSION: Negligible

COVER: (Cover not sampled this year)

DOMINANT PLANT SPECIES OBSERVED:

Atriplex canescens
Atriplex confertifolia
Artemisia tridentata
Gutierrezia sarothrae

Agropyron cristatum
Elymus lanceolatus
Elymus cinereus
Elymus smithii
Stipa comata
Stipa hymenoides

NOTES:

1) Sampled for qualitative data in 2000.

2) Most of the cell was in fair condition, but there were some patchy areas dominated by weedy species. (~).

3) In 1999 we sampled extensively for quantitative data. A separate report was written and submitted to Energy West for this area for a potential bond release application.

ENERGY WEST MINING COMPANY
QUALITATIVE SAMPLING DATA SHEET AND
QUANTITATIVE/QUALITATIVE NOTES
2000

SITE NAME: Cell #7 '92 Partial Cell #7 '93

AREA: Cottonwood Mine Old Waste Rock Area (Interim Reveg)

DATE: August 28 - September 2, 2000

WORKERS: P. Collins, D. Collins

SLOPE: 0 - 2 deg

EXPOSURE: E

ANIMAL USE/DISTURBANCE: Slight

EROSION: Negligible

COVER: (Cover not sampled this year)

DOMINANT PLANT SPECIES OBSERVED:

Atriplex canescens
Gutierrezia sarothrae

Agropyron cristatum
Elymus lanceolatus
Elymus smithii
Stipa comata
Stipa hymenoides

NOTES:

1) Sampled for qualitative data in 2000.

2 Very good grass cover, shrubs were getting larger but there was not many of them. Also there were few forb species present.

3) A separate report has been written and submitted to Energy West for this area for a potential bond release application.

ENERGY WEST MINING COMPANY
QUALITATIVE SAMPLING DATA SHEET AND
QUANTITATIVE/QUALITATIVE NOTES
2000

SITE NAME: Berm 1

AREA: Cottonwood Mine Old Waste Rock Area (1983 Interim Reveg)

DATE: August 28 - September 2, 2000

WORKERS: P. Collins, D. Collins

SLOPE: 1-20 deg.

EXPOSURE: E

ANIMAL USE/DISTURBANCE:

EROSION: Negligible

COVER: (Cover not sampled this year)

DOMINANT PLANT SPECIES OBSERVED:

Atriplex canescens
Gutierrezia sarothrae

Salsola pestifer
Halogeton glomeratus

Elymus lanceolatus
Stipa hymenoides

NOTES:

1) Sampled qualitatively only in 2000.

2) A separate report was written and submitted to Energy West for this area for a potential bond release application.

3) Some of the berm has been disturbed by gas companies previously. This disturbed area is comprised mostly of weeds with some woody species. (~).

ENERGY WEST MINING COMPANY
QUALITATIVE SAMPLING DATA SHEET AND
QUANTITATIVE/QUALITATIVE NOTES
2000

SITE NAME: Berm 2

AREA: Cottonwood Mine Old Waste Rock Area (1984 Interim Reveg)

DATE: August 28 - September 2, 2000

WORKERS: P. Collins, D. Collins

SLOPE: 0-20 deg.

EXPOSURE: E & N

ANIMAL USE/DISTURBANCE:

EROSION: Negligible

COVER: (Cover not sampled this year)

DOMINANT PLANT SPECIES OBSERVED:

Artemisia tridentata
Atriplex confertifolia
Atriplex canescens
Chrysothamnus nauseosus
Gutierrezia sarothrae

Elymus lanceolatus
Elymus smithii
Stipa hymenoides

NOTES:

1) Qualitative sampling methods were employed.

2) There were very few forbs present. The dominants were fourwing saltbush and several grasses. Many more shrubs were present, however.

3) Many mature shrubs were present.

ENERGY WEST MINING COMPANY
QUALITATIVE SAMPLING DATA SHEET AND
QUANTITATIVE/QUALITATIVE NOTES
2000

SITE NAME: Berm 3

AREA: Cottonwood Mine Old Waste Rock Area (1985 Interim Reveg)

DATE: August 28 - September 2, 2000

WORKERS: P. Collins, D. Collins

SLOPE: 0-20 deg.

EXPOSURE: NE & SW

ANIMAL USE/DISTURBANCE:

EROSION: Negligible

COVER: (Cover not sampled this year)

DOMINANT PLANT SPECIES OBSERVED:

Artemisia tridentata
Atriplex canescens
Cercocarpus montanus
Chrysothamnus nauseosus
Gutierrezia sarothrae

Machaeranthera canescens

Agropyron cristatum
Elymus smithii
Elymus lanceolatus
Stipa comata
Stipa hymenoides

NOTES:

1) Qualitative sampling methods were employed.

2) There were very few forbs present. The dominants were fourwing saltbush and several grasses. Many more shrubs were present, however.

3) Many mature shrubs were present.

ENERGY WEST MINING COMPANY
QUALITATIVE SAMPLING DATA SHEET AND
QUANTITATIVE/QUALITATIVE NOTES
2000

SITE NAME: Berm 4

AREA: Cottonwood Mine Old Waste Rock Area ('86 Interim Reveg)

DATE: August 28 - September 2, 2000

WORKERS: P. Collins, D. Collins

SLOPE: 28 deg.

EXPOSURE: N, E

ANIMAL USE/DISTURBANCE:

EROSION: Negligible

COVER: (Cover not sampled this year)

DOMINANT PLANT SPECIES OBSERVED:

Atriplex canescens
Chrysothamnus nauseosus
Gutierrezia sarothrae
Ephedra viridis

Agropyron cristatum
Elymus lanceolatus
Elymus smithii
Elymus spicatus
Stipa hymenoides

NOTES:

1) Qualitative Sampling was done in 2000.

2) Very good cover of grass and fair cover of mature shrubs.

3) Berm condition was very good.

4) Low species diversity.

ENERGY WEST MINING COMPANY
QUALITATIVE SAMPLING DATA SHEET AND
QUANTITATIVE/QUALITATIVE NOTES
2000

SITE NAME: CTW Reference Area

AREA: Cottonwood Mine Old Waste Rock Area

DATE: August 28 - September 2, 2000

WORKERS: P. Collins, D. Collins

SLOPE: 1 - 5 deg

EXPOSURE: E

ANIMAL USE/DISTURBANCE:

EROSION: Slight, normal

COVER: (Cover not sampled this year)

DOMINANT PLANT SPECIES OBSERVED:

Cercocarpus montanus
Ephedra viridis
Juniperus osteosperma
Opuntia polyacantha
Pinus edulis
Yucca harrimaniae

Lepidium montanum
Descurainia pinnata
Eriogonum bicolor
Euphorbia fendleri
Penstemon pachyphyllus
Cryptantha sp.

NOTES:

1) Qualitative data taken in 2000.

2) No noticeable change from last year.

3) A separate report was written and submitted to Energy West for this area last year for a potential bond release application.

ENERGY WEST MINING COMPANY
QUALITATIVE SAMPLING DATA SHEET AND
QUANTITATIVE/QUALITATIVE NOTES
2000

SITE NAME: CTW Soil Pile (A,C)'94

AREA: Cottonwood Mine

DATE: August 28 - September 2, 2000

WORKERS: P. Collins

SLOPE: 25 deg.

EXPOSURE: south

ANIMAL USE/DISTURBANCE: slight

EROSION: negligible to slight

COVER: (Cover not sampled this year)

DOMINANT PLANT SPECIES OBSERVED:

Soil Pile A
Atriplex canescens
Chrysothamnus nauseosus

Halogeton glomeratus
Astragalus cicer
Machaeranthera canescens
Grindelia squarrosa

Elymus lanceolatus
Elymus smithii
Elymus cinereus
Stipa hymenoides

Soil Pile B (removed)

Soil Pile C
Artemisia tridentata
Atriplex canescens
Chrysothamnus nauseosus
Gutierrezia sarothrae

Astragalus cicer
Penstemon palmeri

Elymus smithii
Elymus lanceolatus

NOTES:

1) Only qualitative data taken this year.

2) Cover, density and diversity was in good shape.

ENERGY WEST MINING COMPANY
QUALITATIVE SAMPLING DATA SHEET AND
QUANTITATIVE/QUALITATIVE NOTES
2000

SITE NAME: Road Slopes

AREA: Cottonwood Mine New Waste Rock Area (1990 Interim)

DATE: August 28 - September 2, 2000

WORKERS: P. Collins, D. Collins

SLOPE: Variable

EXPOSURE: Variable

ANIMAL USE/DISTURBANCE: Slight

EROSION: Negligible

COVER: (Cover not sampled this year)

DOMINANT PLANT SPECIES OBSERVED:

Artemisia tridentata
Artemisia nove
Atriplex canescens
Atriplex confertifolia
Ceratoides lanata
Chrysothamnus nauseosus

Penstemon palmeri

Elymus lanceolatus
Elymus cinereus
Elymus spicatus
Sporobolus airoides
Stipa hymenoides

NOTES: 1) Qualitative data only. Most of the plant species were desirable with good cover.

2) Good species diversity.

3) Site looked excellent for cover and diversity.

ENERGY WEST MINING COMPANY
QUALITATIVE SAMPLING DATA SHEET AND
QUANTITATIVE/QUALITATIVE NOTES
2000

SITE NAME: Topsoil Stockpiles

AREA: Cottonwood Mine New Waste Rock Area (1990 Interim)

DATE: August 28 - September 2, 2000

WORKERS: P. Collins, D. Collins

SLOPE: Variable

EXPOSURE: Variable

ANIMAL USE/DISTURBANCE: Slight

EROSION: Negligible

COVER: (Cover not sampled this year)

DOMINANT PLANT SPECIES OBSERVED:
Artemisia tridentata
Atriplex canescens
Atriplex confertifolia
Ceratoides lanata
Chrysothamnus nauseosus
Eriogonum corymbosum

Halogeton glomeratus
Penstemon palmeri
Salsola pestifer

Elymus lanceolatus
Elymus salina

NOTES: 1) Sampled qualitatively only this year.

2) Majority of site looked very good. One small area was dominated by halogeton

3) Good diversity.

ENERGY WEST MINING COMPANY
QUALITATIVE SAMPLING DATA SHEET AND
QUANTITATIVE/QUALITATIVE NOTES
2000

SITE NAME: Subsoil Stockpiles

AREA: Cottonwood Mine New Waste Rock Area (1990 Interim)

DATE: August 28 - September 2, 2000

WORKERS: P. Collins, D. Collins

SLOPE: Variable

EXPOSURE: Variable

ANIMAL USE/DISTURBANCE:

EROSION: Slight to moderate (see notes below)

COVER: (Cover not sampled this year)

DOMINANT PLANT SPECIES OBSERVED:

Atriplex canescens
Atriplex confertifolia
Atriplex gardneri

Halogeton glomeratus
Penstemon palmeri

Elymus cinereus
Elymus lanceolatus
Elymus smithii

NOTES:

1) Qualitative data taken his year.

2) The north end of the subsoil pile had moderate erosion and was dominated by weedy species e.g. halogeton and other species e.g. Gardner saltbush.(~)

3) The south end of the pile had more grasses and shrubs and much less erosion, except one area that also had moderate erosion.

4) If we listed by total desirable cover, it would be north (worse) to south (best).

ENERGY WEST MINING COMPANY
QUALITATIVE SAMPLING DATA SHEET AND
QUANTITATIVE/QUALITATIVE NOTES
2000

SITE NAME: Sediment Pond Banks

AREA: Cottonwood Mine New Waste Rock Area (1990 Interim)

DATE: August 28 - September 2, 2000

WORKERS: P. Collins, D. Collins

SLOPE: Variable

EXPOSURE: Variable

ANIMAL USE/DISTURBANCE: slight

EROSION: Negligible

COVER: (Cover not sampled this year)

DOMINANT PLANT SPECIES OBSERVED:
Artemisia nova
Artemisia tridentata
Atriplex confertifolia
Ceratoides lanata
Gutierrezia sarothrae

Penstemon palmeri

Elymus junceus
Elymus lanceolatus
Elymus cinereus
Elymus spicatus

NOTES:
1) Site looked good.
2) Sampled qualitatively this year.

ENERGY WEST MINING COMPANY
QUALITATIVE SAMPLING DATA SHEET AND
QUANTITATIVE/QUALITATIVE NOTES
2000

SITE NAME: Refuse Berm '91 (Final) - New Waste Rock Site

AREA: Cottonwood Mine

DATE: August 28 - September 2, 2000

WORKERS: P. Collins, D. Collins

SLOPE: 28 deg.

EXPOSURE: S.

ANIMAL USE/DISTURBANCE: slight

EROSION: Mostly "Slight", but moderate in a couple of areas for the first time

COVER: (see quantitative data)

DOMINANT PLANT SPECIES OBSERVED:

Atriplex canescens
Atriplex confertifolia
Ceratoides lanata

Penstemon palmeri

Elymus lanceolatus
Stipa hymenoides

WOODY SPECIES DENSITY:

DENSITY: 2000	**Number/Ac**
Atriplex confertifolia	772.58
Atriplex canescens	772.58
Ceratoides lanata	29358.01
TOTAL	30903.16

BIOMASS PRODUCTION:

PRODUCTION:2000	POUNDS/ACRE
Herbaceous	116.06
Woody	511.20
TOTAL	627.26

NOTES:

1) Like last year, even though Berm `96 is the most recent revegetation accomplished, the shrubs appear more mature and the cover is greater than the `91 and `94 Berms.

2) Site looks good.

3) Good density of shrubs and grasses, but few forbs.

4) Sampled qualitative and quantitatively this year. Placed one 200 ft transect on the slope and sampled randomly every 20 ft. Cover using ocular methods (n=10), density (n=10) using pt. quarter method, production by double sampling (n=10).

5) Species diversity was low.

6) Dominate shrub species was winterfat by far. Plants were small and had low productivity.

ENERGY WEST
Refuse Berm ' 91 (Final) New Waste Rock
Cottonwood Mine
Slope: 28 deg
Exposure: South

Sample Date: 28 Aug - 2 Sept 00	1.00	2.00	3.00	4.00	5.00	6.00	7.00
SHRUBS							
Atriplex canescens	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Atriplex confertifolia	0.00	0.00	0.00	5.00	0.00	0.00	0.00
Ceratoides lanata	10.00	25.00	25.00	17.00	15.00	25.00	24.00
FORBS							
Halogeton glomeratus	0.00	0.00	0.00	0.00	0.00	0.00	1.00
Penstemon palmeri	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GRASSES							
Elymus lanceolatus	10.00	0.00	0.00	3.00	5.00	0.00	0.00
Stipa hymenoides	0.00	0.00	0.00	0.00	0.00	0.00	0.00
COVER							
Total Living Cover	20.00	25.00	25.00	25.00	20.00	25.00	25.00
Litter	15.00	5.00	10.00	10.00	5.00	5.00	5.00
Bareground	40.00	60.00	40.00	45.00	55.00	55.00	60.00
Rock	25.00	10.00	25.00	20.00	20.00	15.00	10.00
% COMPOSITION							
Shrubs	50.00	100.00	100.00	88.00	75.00	100.00	96.00
Forbs	0.00	0.00	0.00	0.00	0.00	0.00	4.00
Grasses	50.00	0.00	0.00	12.00	25.00	0.00	0.00

ENERGY WEST
Refuse Berm ' 91 (Final) New Waste Ro
Cottonwood Mine
Slope: 28 deg
Exposure: South
Sample Date: 28 Aug - 2 Sept 00

8.00	9.00	10.00	Mean	SDev	Freq	
						SHRUBS
0.00	5.00	0.00	0.50	1.50	10.00	*Atriplex canescens*
0.00	0.00	0.00	0.50	1.50	10.00	*Atriplex confertifolia*
8.00	25.00	20.00	19.40	6.25	100.00	*Ceratoides lanata*
						FORBS
0.00	0.00	0.00	0.10	0.30	10.00	*Halogeton glomeratus*
0.00	0.00	5.00	0.50	1.50	10.00	*Penstemon palmeri*
						GRASSES
2.00	0.00	0.00	2.00	3.13	40.00	*Elymus lanceolatus*
0.00	0.00	10.00	1.00	3.00	10.00	*Stipa hymenoides*
						COVER
10.00	30.00	35.00	24.00	6.24		Total Living Cover
5.00	5.00	5.00	7.00	3.32		Litter
65.00	50.00	35.00	50.50	9.60		Bareground
20.00	15.00	25.00	18.50	5.50		Rock
						% COMPOSITION
80.00	100.00	57.14	84.61	17.76		Shrubs
0.00	0.00	14.29	1.83	4.32		Forbs
20.00	0.00	28.57	13.56	16.27		Grasses

ENERGY WEST MINING COMPANY
QUALITATIVE SAMPLING DATA SHEET AND
QUANTITATIVE/QUALITATIVE NOTES
2000

SITE NAME: Refuse Berm '94 (Final) - New Waste Rock Site

AREA: Cottonwood Mine

DATE: August 28 - September 2, 2000

WORKERS: P. Collins

SLOPE: 25 deg.

EXPOSURE: south

ANIMAL USE/DISTURBANCE: moderate

EROSION: Moderate erosion this year on west side (~).

COVER: (Cover not sampled this year)

DOMINANT PLANT SPECIES OBSERVED:

Atriplex confertifolia
Atriplex canescens
Ceratoides lanata

Melilotus officinalis

Hilaria jamesii
Hordeum jubatum
Elymus cinereus
Elymus lanceolatus

WOODY SPECIES DENSITY:

NOTES:

1) Qualitative data only recorded this year.

2) See also notes for Refuse Berm `96.

3) Better diversity and more productive plants on this berm compared to `91.

ENERGY WEST MINING COMPANY
QUALITATIVE SAMPLING DATA SHEET AND
QUANTITATIVE/QUALITATIVE NOTES
2000

SITE NAME: Refuse Berm (seeded 1996)

AREA: Cottonwood Mine New Waste Rock Area (1990 Interim)

DATE: August 28 - September 2, 2000

WORKERS: P. Collins, D. Collins

SLOPE: 28 deg.

EXPOSURE: S & E

ANIMAL USE/DISTURBANCE: No obvious disturbance

EROSION: Negligible

COVER: (Cover not sampled this year)

DOMINANT PLANT SPECIES OBSERVED:

Atriplex gardneri
Atriplex canescens
Ceratoides lanata

Elymus lanceolatus

NOTES:

1) Took qualitative data this year.

2) Like last year, although Berm `96 is the most recent revegetation accomplished, the shrubs appear more mature and the cover is greater than the `91 and `94 Berms. However, the shrubs in Berm `96 were almost exclusively fourwing saltbush whereas species diversity was greater on the other berms. (~).

3) The site was dominated by fourwing saltbush, having large and productive plants.

4) Species diversity, however, was quite low and possibly less cover than in `94 Berm.

COLOR
PHOTOGRAPHS

Cottonwood Mine - Old Fan Road (Final) '84

Cottonwood Mine - Reference Area

Cottonwood Mine - 4th East Road '86

Cottonwood Mine - Storage Yard Slope

Cottonwood Mine - Parking Lot Slope

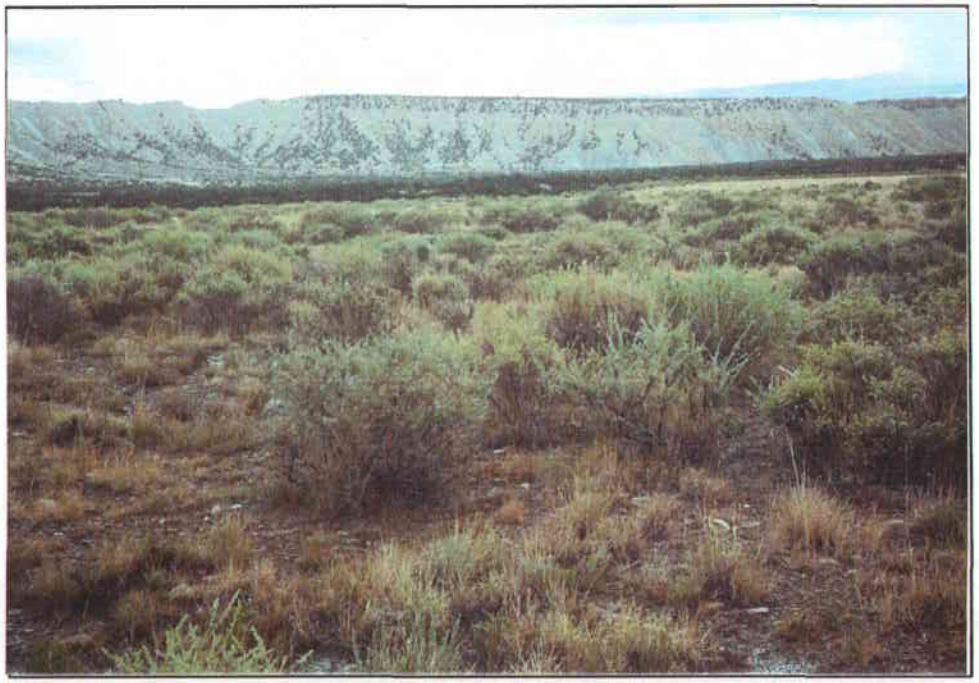
Cottonwood Mine - Road/Silo Pad Slope

Cottonwood Mine - Tipple Area Slope

Cottonwood Mine - Sediment Pond Banks

Cottonwood Mine - Ninth East Breakout (Final '99)

Cottonwood Mine - Old Waste Rock - Cell #1



Cottonwood Mine - Old Waste Rock - Cell #2

Cottonwood Mine - Old Waste Rock - Cell #3

Cottonwood Mine - Old Waste Rock - Cell #4

Cottonwood Mine - Old Waste Rock - Cell #5

Cottonwood Mine - Old Waste Rock - Cell #6

Cottonwood Mine - Old Waste Rock - Berm #1

Cottonwood Mine - Old Waste Rock - Berm #2

Cottonwood Mine - Old Waste Rock - Berm #3

Cottonwood Mine - Old Waste Rock - Berm #4

Cottonwood Mine - Old Waste Rock - CTW Reference Area

Cottonwood Mine - Old Waste Rock - CTW Soil Piles (A) '94

Cottonwood Mine - Old Waste Rock - CTW Soil Piles (C) '94

Cottonwood Mine - New Waste Rock - Road Slope

Cottonwood Mine - New Waste Rock - Topsoil Stockpiles

Cottonwood Mine - New Waste Rock - Subsoil Stockpiles

Cottonwood Mine - New Waste Rock - Sediment Pond Banks

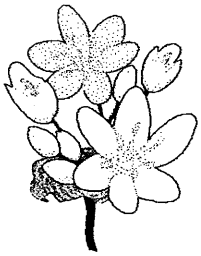
Cottonwood Mine - New Waste Rock - All Refuse Piles ('91, '94 & '96)

Cottonwood Mine - New Waste Rock - Refuse Berm '91 (Final)

Cottonwood Mine - New Waste Rock - Refuse Berm '94 (Final)

Cottonwood Mine - New Waste Rock - Refuse Berm '96 (Final) seeded

DES-BEE-DOVE AREA



ENERGY WEST MINING COMPANY
QUALITATIVE SAMPLING DATA SHEET AND
QUANTITATIVE/QUALITATIVE NOTES
2000

SITE NAME: Beehive Yard Slope

AREA: Des-Bee-Dove (1988 Reveg. Area)

DATE: August 28 - September 2, 2000

WORKERS: P. Collins, D. Collins

SLOPE: 20-50 deg.

EXPOSURE: SE

AREA: 1.6 acres

ANIMAL USE/DISTURBANCE:

EROSION: Negligible

COVER: (No quantitative data were recorded this year)

DOMINANT PLANT SPECIES OBSERVED:

Atriplex canescens
Atriplex confertifolia
Chrysothamnus nauseosus
Gutierrezia sarothrae

Penstemon palmeri

Elymus lanceolatus
Elymus smithii
Elymus spicatus
Elymus cinereus
Elymus salinus
Stipa hymenoides

NOTES:

1) Qualitative sampling only was done this year.

2) Site looks excellent.

3) Good density of species.

4) The chain link fence covering the ground is still holding earth well.

ENERGY WEST MINING COMPANY
QUALITATIVE SAMPLING DATA SHEET AND
QUANTITATIVE/QUALITATIVE NOTES
2000

SITE NAME: Beehive Road Berm

AREA: Des-Bee-Dove (1988 Reveg. Area)

DATE: August 28 - September 2, 2000

WORKERS: P. Collins, D. Collins

SLOPE: 30 deg

AREA SIZE: .1 acre

EXPOSURE: Variable

ANIMAL USE/DISTURBANCE: Heavy cattle use.

EROSION: Negligible

COVER: (No quantitative data were recorded this year)

DOMINANT PLANT SPECIES OBSERVED:

Atriplex confertifolia
Chrysothamnus nauseosus

Halogeton glomeratus
Penstemon palmeri

Elymus cinereus
Elymus lanceolatus
Elymus salinus
Elymus smithii

NOTES:
1) Qualitative sampling only was done this year.
2) Good representation of grasses.
3) This area supported mostly woody plant spp., some grass and few weeds. However, there were some patchy weed areas.
4) Good vegetative cover.

ENERGY WEST MINING COMPANY
QUALITATIVE SAMPLING DATA SHEET AND
QUANTITATIVE/QUALITATIVE NOTES
2000

SITE NAME: Deseret Road Berm

AREA: Des-Bee-Dove (1988 Reveg. Area)

DATE: August 28 - September 2, 2000

WORKERS: P. Collins, D. Collins

SLOPE: 6-10 deg.

EXPOSURE: E

AREA: .2 acre

ANIMAL USE/DISTURBANCE: Negligible

EROSION: Slight

COVER: (No quantitative data taken this year)

DOMINANT PLANT SPECIES OBSERVED:

Atriplex canescens
Chrysothamnus nauseosus

Halogeton glomeratus
Penstemon palmeri

Elymus cinereus
Elymus lanceolatus
Elymus smithii

NOTES: 1) Qualitative sampling only was done this year.

2) Much of the vegetation was disturbed due to roadside maintenance.

3) The site seemed be weedy due to recent work in area related to reclamation.

ENERGY WEST MINING COMPANY
QUALITATIVE SAMPLING DATA SHEET AND
QUANTITATIVE/QUALITATIVE NOTES
2000

SITE NAME: Portal Road Berm

AREA: Des-Bee-Dove (1988 Reveg. Area)

DATE: August 28 - September 2, 2000

WORKERS: P. Collins, D. Collins

SLOPE: 30 deg.

EXPOSURE: SW

AREA: .1 acre

ANIMAL USE/DISTURBANCE: Slight

EROSION: Negligible, slope stable

COVER: (No quantitative data were recorded this year)

DOMINANT PLANT SPECIES OBSERVED:
Atriplex confertifolia
Chrysothamnus nauseosus
Eriogonum corymbosum

Bassia hyssopifolia
Halogeton glomeratus
Penstemon palmeri

Agropyron cristatum
Elymus salinus
Elymus smithii
Elymus lanceolatus

NOTES: 1) Qualitative sampling only was done this year.

2) As mentioned last year, the inside of the berm had been scraped for road maintenance. That's why it's so sparse and weedy, but it was better this year when compared to last.

ENERGY WEST MINING COMPANY
QUALITATIVE SAMPLING DATA SHEET AND
QUANTITATIVE/QUALITATIVE NOTES
2000

SITE NAME: Bathhouse Road Berm

AREA: Des-Bee-Dove (1988 Interim Reveg. Area)

DATE: August 28 - September 2, 2000

WORKERS: P. Collins, D. Collins

SLOPE: 30 deg.

EXPOSURE: SW

AREA: .1 acre

ANIMAL USE/DISTURBANCE: Negligible

EROSION: Negligible, berm is stable

COVER: (No quantitative data this year)

DOMINANT PLANT SPECIES OBSERVED:

*Atriplex confertifolia**
Chrysothamnus nauseosus
Tamarix ramosissimum

Penstemon palmeri
Cynoglossum officinale

Agropyron cristatum
Elymus cinereus
Elymus lanceolatus
Elymus smithii
Elymus elymoides

NOTES: 1) Qualitative sampling only was done this year.

2) Site looked very good with patches of desirable species and patches of weeds, but mostly desirables.

ENERGY WEST MINING COMPANY
QUALITATIVE SAMPLING DATA SHEET AND
QUANTITATIVE/QUALITATIVE NOTES
2000

SITE NAME: Tipple Slope

AREA: Des-Bee-Dove (1988 Reveg. Area)

DATE: August 28 - September 2, 2000

WORKERS: P. Collins, D. Collins

SLOPE: 40-45 deg.

EXPOSURE: Variable

AREA: .4 acre

ANIMAL USE/DISTURBANCE: Negligible

EROSION: Slight considering how steep the slope is!

COVER: (No quantitative data recorded this year.)

DOMINANT PLANT SPECIES OBSERVED:
Atriplex confertifolia
Chrysothamnus nauseosus
Eriogonum corymbosum

Halogeton glomeratus
Penstemon palmeri

Elymus cinereus
Elymus lanceolatus
Elymus salinus

NOTES: 1) The slope's vegetation looked good - excellent considering the steepness of the slope.

2) Qualitative sampling only was done this year. We did not sample for density and production in 1999, but previous data has been retained for observation (see above).

3) Some coal fines were mixed in soils/spoils.

ENERGY WEST MINING COMPANY
QUALITATIVE SAMPLING DATA SHEET AND
QUANTITATIVE/QUALITATIVE NOTES
2000

SITE NAME: Sediment Storage Slope

AREA: Des-Bee-Dove (1988 Interim Reveg. Area)

DATE: August 28 - September 2, 2000

WORKERS: P. Collins, D. Collins

SLOPE: 3 - 5 deg.

EXPOSURE: S SE

AREA: 4.4 acres

ANIMAL USE/DISTURBANCE: Negligible

EROSION: There was some slight to moderate erosion on outslopes.

COVER: (No quantitative data taken this year)

DOMINANT PLANT SPECIES OBSERVED:

Atriplex gardneri
Chrysothamnus nauseosus
Eriogonum corymbosum
Sarcobatus vermiculatus

Halogeton glomeratus
Suaeda calceoliformis

Elymus salinus
Hordeum jubatum
Elymus cinereus
Stipa hymenoides

NOTES:
1) Site was dominated by Gardner saltbush and halogeton.
2) Possibly fewer weeds this year.
3) Map shows a large area to sample, but the name suggests only the slopes.
4) We have always monitored the entire area as map shows.
5) There were no grasses noted last year, but this year there were several.

ENERGY WEST MINING COMPANY
QUALITATIVE SAMPLING DATA SHEET AND
QUANTITATIVE/QUALITATIVE NOTES
2000

SITE NAME: Sediment Pond Banks

AREA: Des-Bee-Dove (1988 Interim Reveg Area)

DATE: August 28 - September 2, 2000

WORKERS: P. Collins, D. Collins

SLOPE: 30 deg.

EXPOSURE: E & W

AREA: .9 acre

ANIMAL USE/DISTURBANCE: Negligible

EROSION: Minor

COVER: (No quantitative data taken this year)

DOMINANT PLANT SPECIES OBSERVED:

Atriplex confertifolia
Atriplex gardneri
Chrysothamnus nauseosus
Sarcobatus vermiculatus

Halogeton glomeratus
Machaeranthera canescens

Elymus salinus
Elymus spicatus
Stipa hymenoides

NOTES: 1) Qualitative sampling only was done this year.

2) Site looked fair to excellent, depending on specific area. Banks were dominated by rubber rabbitbrush.

ENERGY WEST MINING COMPANY
QUALITATIVE SAMPLING DATA SHEET AND
QUANTITATIVE/QUALITATIVE NOTES
2000

SITE NAME: Beehive Substation Slope

AREA: Des-Bee-Dove (1986 Reveg. Area)

DATE: August 28 - September 2, 2000

WORKERS: P. Collins, D. Collins

SLOPE: 35 deg.

EXPOSURE: S

AREA: .1 acre

ANIMAL USE/DISTURBANCE: Slight

EROSION: Negligible

COVER: (no quantitative data this year)

DOMINANT PLANT SPECIES OBSERVED:

Atriplex confertifolia
Chrysothamnus nauseosus

Penstemon palmeri
Elymus smithii
Elymus lanceolatus
Stipa hymenoides

NOTES: 1) Qualitative sampling only was done this year.

2) Site continues to look very good for cover and diversity.

3) Work had been done near area. It still looks good.

4) Diversity of grass and shrub was good, but there were few forbs.

ENERGY WEST MINING COMPANY
QUALITATIVE SAMPLING DATA SHEET AND
QUANTITATIVE/QUALITATIVE NOTES
2000

SITE NAME: Sediment Pond Area

AREA: Des-Bee-Dove (1985 Reveg. Area)

DATE: August 28 - September 2, 2000

WORKERS: P. Collins, D. Collins

SLOPE: 0-10 deg.

EXPOSURE: S

AREA: .7 acre

ANIMAL USE/DISTURBANCE: Negligible

EROSION: Negligible

COVER: (no quantitative data taken this year)

DOMINANT PLANT SPECIES OBSERVED:

Atriplex canescens
Atriplex confertifolia
Chrysothamnus nauseosus
Gutierrezia sarothrae
Ephedra viridis
Sarcobatus vermiculatus

Agropyron cristatum
Elymus salinus
Elymus lanceolatus
Hilaria jamesii
Stipa hymenoides

NOTES: 1) We sampled qualitatively this year.

2) Site looked excellent.

3) Site was dominated by shrubs, mostly fourwing saltbush and broom snakeweed.

ENERGY WEST MINING COMPANY
QUALITATIVE SAMPLING DATA SHEET AND
QUANTITATIVE/QUALITATIVE NOTES
2000

SITE NAME: Bathhouse Slope

AREA: Des-Bee-Dove (1984 Reveg. Area)

DATE: August 28 - September 2, 2000

WORKERS: P. Collins, D. Collins

SLOPE: 25 deg.

EXPOSURE: Variable

AREA: 2.3 acre

ANIMAL USE/DISTURBANCE:

EROSION: Minor, slope holding well for its angle.

COVER: Qualitative data only

DOMINANT PLANT SPECIES OBSERVED:
Atriplex canescens
Atriplex confertifolia
*Chrysothamnus nauseosus**

Aster glaucodes
Halogeton glomeratus
Penstemon palmeri

Agropyron cristatum
Bromus tectorum
Elymus lanceolatus
Elymus smithii
Elymus cinereus
Stipa hymenoides

NOTES:
1) Sampled only qualitatively again this year.
2) Vegetative cover remains good & diverse.

ENERGY WEST MINING COMPANY
QUALITATIVE SAMPLING DATA SHEET AND
QUANTITATIVE/QUALITATIVE NOTES
2000

SITE NAME: Materials Yard Slope

AREA: Des-Bee-Dove (1984 Reveg. Area)

DATE: August 28 - September 2, 2000

WORKERS: P. Collins, D. Collins

SLOPE: 20-25 deg.

EXPOSURE: SE

AREA: 1.1 acre

ANIMAL USE/DISTURBANCE: Negligible

EROSION: Mostly negligible.

COVER: (Cover not sampled this year) (qual, data only)

DOMINANT PLANT SPECIES OBSERVED:
Atriplex confertifolia
*Chrysothamnus nauseosus**
Gutierrezia sarothrae

Aster chilensis
Penstemon palmeri

Bromus tectorum
Elymus cinereus
*Elymus lanceolatus**
*Elymus smithii**
Stipa hymenoides

* dominants

NOTES: 1) Sampled for qualitative data only this year.

2) Very good shrub and grass cover for such a steep slope.

ENERGY WEST MINING COMPANY
QUALITATIVE SAMPLING DATA SHEET AND
QUANTITATIVE/QUALITATIVE NOTES
2000

SITE NAME: Test Plot (1989)

AREA: Des-Bee-Dove

DATE: August 28 - September 2, 2000

WORKERS: P. Collins

SLOPE: 26 deg.

EXPOSURE: S

AREA: .6 acre

ANIMAL USE/DISTURBANCE: Negligible

EROSION: Moderate

COVER: (no quantitative data this year)

PLANT SPECIES PLANTED:

Atriplex canescens
Atriplex corrugata
Atriplex confertifolia
Ceratoides lanata
Kochia prostrata

Linum lewisii
Melilotus officinalis
Sphaeralcea coccinea

Elymus lanceolatus
Elymus smithii
Elymus cinereus
Stipa hymenoides
Sporobolus airoides

PLANT SPECIES OBSERVED:

Sarcobatus vermiculatus
Kochia prostrata
Atriplex canescens
Atriplex gardneri

NOTES: 1) Sampled west side, then the east side.

2) Qualitative sampling only was done this year.

3) West side looked better. It seemed to be dominated by Kochia prostrata this year for the first time. (I collected the plant to confirm this. I will key it later).

ENERGY WEST MINING COMPANY
QUALITATIVE SAMPLING DATA SHEET AND
QUANTITATIVE/QUALITATIVE NOTES
2000

SITE NAME: Beehive Slope(reseeded in Jan. 1997)

AREA: Des-Bee-Dove (1988 Reveg. Area)

DATE: August 28 - September 2, 2000

WORKERS: P. Collins, D. Collins

SLOPE: 20-50 deg.

EXPOSURE: SE

AREA: 1.6 acres

ANIMAL USE/DISTURBANCE: Negligible

EROSION: Slight, slope is stable

COVER: (No quantitative data were recorded this year)

DOMINANT PLANT SPECIES OBSERVED:

Atriplex canescens
Chrysothamnus nauseosus
Ceratoides lanata
Gutierrezia sarothrae

Penstemon palmeri

Elymus smithii
Elymus lanceolatus
Stipa hymenoides

NOTES:

1) Qualitative sampling only was done this year.

2) Considering this is a relatively recent revegetation site, the area looks very good.

3) There were more desirable species this year.

4) Grass dominated certain areas and shrubs, other areas.

ENERGY WEST MINING COMPANY
QUALITATIVE SAMPLING DATA SHEET AND
QUANTITATIVE/QUALITATIVE NOTES
2000

SITE NAME: Subsoil Pile at Sediment Pond (Jan)

AREA: Des-Bee-Dove (1985 Reveg. Area)

DATE: August 28 - September 2, 2000

WORKERS: P. Collins, D. Collins

SLOPE: Sideslope ~ 28 deg., top ~ 1 deg.

EXPOSURE: variable

ANIMAL USE/DISTURBANCE: Negligible

EROSION: Minor on most slopes

COVER: no quantitative data taken this year

DOMINANT PLANT SPECIES OBSERVED:

Atriplex gardneri
Atriplex canescens
Chrysothamnus nauseosus
Ephedra viridis
Sarcobatus vermiculatus

Eriogonum (annual)
*Astragalus cicer**
Salsola pestifer

Elymus salinus
Hilaria jamesii

* dominant desirable species.

NOTES: 1) We sampled qualitatively this year.

2) The vegetation on the top of pile was dominated by cicer milkvetch (90%).

3) There was much Gardner saltbush becoming established.

4) Russian thistle was common.

5) The side slopes had better diversity but less cover when compared to the top of pile.

COLOR
PHOTOGRAPHS

Des Bee Dove - Beehive Yard Slope

Des Bee Dove - Beehive Road Berm

Des Bee Dove - Deseret Road Berm

Des Bee Dove - Portal Road Berm

Des Bee Dove - Bathhouse Road Berm

Des Bee Dove - Tipple Slope

Des Bee Dove - Sediment Storage Slope

Des Bee Dove - Sediment Pond Banks

Des Bee Dove - Beehive Substation

Des Bee Dove - Sediment Pond Area

Des Bee Dove - Bathhouse Slope

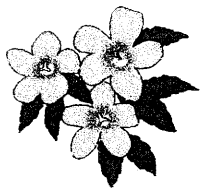
Des Bee Dove - Material Yard Slopes

Des Bee Dove - Test Plots '89

Des Bee Dove - Beehive Slope (Reseed in Jan '97)

Des Bee Dove - Subsoil Pile

DEER CREEK AREA



ENERGY WEST MINING COMPANY
QUALITATIVE SAMPLING DATA SHEET AND
QUANTITATIVE/QUALITATIVE NOTES
2000

SITE NAME: Riparian Reference Area

AREA: Deer Creek

DATE: August 28 - September 3, 2000

WORKERS: P. Collins

SLOPE: 2 - 3 deg.

EXPOSURE: Variable

ANIMAL USE/DISTURBANCE: Used extensively, no severe disturbance.

EROSION: Normal

COVER: (Cover not sampled this year) (overstory plus understory >50%)

DOMINANT PLANT SPECIES OBSERVED:

Abies concolor
Acer negundo
Chrysothamnus nauseosus
Cornus sericea
Mahonia repens
Populus angustifolia
Rosa woodsii
Salix sp.

*Aster foliaceous**

Agrostis stolonifera
Dactylis glomerata
Elymus canadensis

NOTES: 1) Qualitative sampling this year.

2) To locate, find a t-post on the side of the road in a more open area. This was past a more coaly area approximately 200' down from "Temporary Storage Area" and it can be seen as one walks down the road. The t-post is 50 ft below the lower part of the "Roadside Area".

3) Site condition is very good.

ENERGY WEST MINING COMPANY
QUALITATIVE SAMPLING DATA SHEET AND
QUANTITATIVE/QUALITATIVE NOTES
2000

SITE NAME: Mixed Conifer Reference Area

AREA: Deer Creek

DATE: August 28 - September 3, 2000

WORKERS: P. Collins

SLOPE: 15-25 deg.

EXPOSURE: WSW

ANIMAL USE/DISTURBANCE: Used by wildlife, mostly deer sign.

EROSION: Normal

COVER: (Cover not sampled this year) (qualitative estimate ~45%)

DOMINANT PLANT SPECIES OBSERVED:

Abies lasiocarpa
Amalanchier utahensis
Brickellia microphylla
Chrysothamnus depressus
Chrysothamnus viscidiflorus
Chrysothamnus nauseosus
*Eriogonum corymbosum**
Juniperus scopulorum
Mahonia repens
Pachystima myrsinites
Pinus edulis
Pseudotsuga menziesii
Symphoricarpos oreophilus

Aster foliaceous
Linum lewisii
Machaeranthera canescens
Castilleja sp.

*Elymus salinus**
*Elymus spicatus**
Poa fendleriana

NOTES:
1) Qualitative sampling this year.
2) Take access road behind (south) wooden water tank.
3) To locate, I found the SW t-post marking the area north of the adjacent drainage.
4) There was a good representation of Spruce/Fir/Grass, but it was mostly more open.

ENERGY WEST MINING COMPANY
QUALITATIVE SAMPLING DATA SHEET AND
QUANTITATIVE/QUALITATIVE NOTES
2000

SITE NAME: Pinyon-Juniper Reference Area

AREA: Deer Creek

DATE: August 28 - September 3, 2000

WORKERS: P. Collins

SLOPE: 28 deg.

EXPOSURE: E

ANIMAL USE/DISTURBANCE: Used by wildlife, mostly deer and rabbit sign present.

EROSION: Normal

COVER: (Cover not sampled this year) (qualitative estimate ~40%)

DOMINANT PLANT SPECIES OBSERVED:

Amalanchier utahensis
Cercocarpus oreophilus
Chrysothamnus nauseosus
*Ephedra viridis**
Eriogonum corymbosum
*Juniperus osteosperma**
*Pinus edulis**
Symphoricarpos oreophilus

Aster foliaceous
Castilleja sp.
Galium bifolium
Machaeranthera grindelioides
Stanleya pinnata

Bromus carinatus
*Elymus salinus**
Stipa hymenoides

* Dominant species

NOTES: 1) Qualitative sampling this year.

2) Good for a PJ stand and reference area, but I should compare it visually with areas that will be reclaimed to meet these standards in the future.

3) I met with C. Semborski and G. Davis in 1999 to help me locate the site. I used an aerial photograph to find the site, but I never did find t-posts marking it. So, I assumed it was above the "Permeter Boundary" marker. To get there I walked through more of a Mtn. Brush/PJ community to a more classic PJ area. The transition between the two appears to be where the Reference Area is on the photo. Calling it a PJ Reference area is satisfactory however.

4) There was a great deal understory cover (shrub & grass) for a PJ community.

ENERGY WEST MINING COMPANY
QUALITATIVE SAMPLING DATA SHEET AND
QUANTITATIVE/QUALITATIVE NOTES
2000

SITE NAME: C2 Conveyor (IU 132-190) '93

AREA: Deer Creek Mine

DATE: August 28 - September 3, 2000

WORKERS: P. Collins, D. Collins

SLOPE: 8 deg.

EXPOSURE: E

ANIMAL USE/DISTURBANCE: Negligible

EROSION: Negligible on flatter area, moderate on slopes

COVER: (no quantitative data this year)

DOMINANT PLANT SPECIES OBSERVED:

Chrysothamnus nauseosus+*
Ephedra viridis +
Eriogonum corymbosum +
Gutierrezia sarothrae +
*Yucca harrimaniae**
*Artemisia tridentata**

Aster chilensis +
*Halogeton glomeratus**
Machaeranthera canescens +

Elymus lanceolatus +
Elymus cinereus+*
*Elymus smithii**
Stipa hymenoides+*
Stipa comata +

NOTES: 1) Qualitative sampling only was done this year.

2) A sediment control area was recently constructed within one area. This created some disturbance. Surrounding area looked very good. Vegetation observed in this area is denoted by +.

3) Monitoring schedule by Energy West indicated to "check area behind belt line?" We sampled this area too. Vegetation observed in this area is denoted by *. This area had lots of rock cover helping to control erosion.

ENERGY WEST MINING COMPANY
QUALITATIVE SAMPLING DATA SHEET AND
QUANTITATIVE/QUALITATIVE NOTES
2000

SITE NAME: Riparian Areas

AREA: Deer Creek Mine

DATE: August 28 - September 3, 2000

WORKERS: P. Collins

SLOPE: 1 to 5 deg.

EXPOSURE: Variable

AREA: < .5 acre

ANIMAL USE/DISTURBANCE: Negligible

EROSION: Negligible

COVER: (No quantitative data taken this year)

DOMINANT PLANT SPECIES OBSERVED:

Artemisia tridentata
Clematis sp.
Rosa woodsii
Prunus virginiana
Chrysothamnus nauseosus
Sambucus caerulea

Aster chilensis
Grindelia squarrosa

Agropyron cristatum
Elymus cinereus
Elymus hispidus
Elymus spicatus

NOTES:

1) Qualitative data only again this year.

2) The south area is across from the transfer site.

3) Both areas were <5% weeds this year.

4) To locate, there is an opening just north of the riparian area (.4 mi. from coal storage road turn off) on the west side of the road. (200 ft south of opening).

6) Sites looked excellent, nearly weed free now.

7) Most of the species observed were found in both riparian areas.

8) North Riparian Area was dominated by intermediate wheatgrass. It had good cover but low species diversity.

9) The South Riparian Area also looked good and perhaps had higher diversity.

10) See photographs for comparisons.

ENERGY WEST MINING COMPANY
QUALITATIVE SAMPLING DATA SHEET AND
QUANTITATIVE/QUALITATIVE NOTES
2000

SITE NAME: Sediment Pond Dam

AREA: Deer Creek Mine Area

DATE: August 28 - September 3, 2000

WORKERS: P. Collins, D. Collins

SLOPE: 1 - 25 deg.

EXPOSURE: Variable

AREA: < 2 acres

ANIMAL USE/DISTURBANCE: Negligible

EROSION: Negligible

COVER: (qualitative data only)

DOMINANT PLANT SPECIES OBSERVED:

Chrysothamnus nauseosus

Aster foliaceous
Grindelia squarrosa
Kochia scoparia

Elymus smithii
Elymus cinereus
Elymus lanceolatus

NOTES: 1) Qualitative data only this year.

2) Pond has been disturbed by modifications to it.

3) As noted last year, recent disturbance has influenced the vegetation which is now comprised mostly of "weedy" species.

4) The top areas have a fair representation of desirable species.

ENERGY WEST MINING COMPANY
QUALITATIVE SAMPLING DATA SHEET AND
QUANTITATIVE/QUALITATIVE NOTES
2000

SITE NAME: Temp. Sediment Basin

AREA: Deer Creek Mine Area

DATE: August 28 - September 3, 2000

WORKERS: P. Collins

SLOPE: 1-2 deg.

EXPOSURE: Variable

AREA: < 1 acre.

ANIMAL USE/DISTURBANCE: Negligible

EROSION: Negligible

COVER: (qualitative data only)

DOMINANT PLANT SPECIES OBSERVED:

Chrysothamnus nauseosus
Populus angustifolia

Aster chilensis
Astragalus cicer
Medicago sativa

Elymus cinereus
Elymus smithii
Elymus lanceolatus
Elymus salinus
Hordeum jubatum

NOTES: 1) There was a good representation of desirable and almost no weedy spp. The site continues to appear to be improving over time.

ENERGY WEST MINING COMPANY
QUALITATIVE SAMPLING DATA SHEET AND
QUANTITATIVE/QUALITATIVE NOTES
2000

SITE NAME: Roadside Areas

AREA: Deer Creek (1990 Reveg. Area)

DATE: August 28 - September 3, 2000

WORKERS: P. Collins

SLOPE: 5 deg.

EXPOSURE: NE

AREA: < 1 acre

ANIMAL USE/DISTURBANCE: Negligible

EROSION: Negligible.

COVER: (qualitative data only)

DOMINANT PLANT SPECIES OBSERVED:

Aster chilensis
Grindelia squarrosa
Chrysothamnus nauseosus
Gutierrezia sarothrae

Bromus carinatus
Elymus smithii
*Elymus lanceolatus**
Elymus cinereus
Stipa hymenoides

NOTES: 1) Qualitative data sampled.

2) Cover was very good. Dominated by grasses, mostly Gt. Basin wildrye.

3) Good diversity of grasses, but not many shrubs.

4) Very few weedy species.

5) Most of the cover was in the low part of roughened topography.

ENERGY WEST MINING COMPANY
QUALITATIVE SAMPLING DATA SHEET AND
QUANTITATIVE/QUALITATIVE NOTES
2000

SITE NAME: Gate Area Slope

AREA: Deer Creek (1990 Reveg. Area)

DATE: August 28 - September 3, 2000

WORKERS: P. Collins

SLOPE: 20 deg.

EXPOSURE: E

ANIMAL USE/DISTURBANCE: Negligible

EROSION: Still some erosion, but considering the angle of the slope, it's not bad.

COVER: (qualitative data only)

DOMINANT PLANT SPECIES OBSERVED:
Chrysothamnus nauseosus

Aster chilensis
Astragalus cicer
Halogeton glomeratus
Medicago sativa
Penstemon palmeri

Elymus cinereus
Elymus lanceolatus
Elymus smithii

NOTES: 1) Qualitative data only recorded this year. Site looked in good condition considering the slope angle.

2) Site had excellent vegetative cover and good diversity. Grasses dominate the site.

ENERGY WEST MINING COMPANY
QUALITATIVE SAMPLING DATA SHEET AND
QUANTITATIVE/QUALITATIVE NOTES
2000

SITE NAME: Fan Road Slopes

AREA: Deer Creek (1989 Reveg. Area)

DATE: August 28 - September 3, 2000

WORKERS: P. Collins, D. Collins

SLOPE: Variable

EXPOSURE: Variable

AREA: 1.1 acres

ANIMAL USE/DISTURBANCE: Negligible

EROSION: Negligible

COVER: (qualitative only this year)

DOMINANT PLANT SPECIES OBSERVED:

Chrysothamnus nauseosus

Aster chilensis

Agropyron cristatum
Elymus spicatus
Elymus salinus
Elymus cinereus
Hordeum jubatum
Stipa hymenoides

NOTES:
1) Area and species diversity looked good.
2) There were very few woody species here.
3) By the way the map looked, we considered everything on the south side of road (left as you walk up) the Fan Road Slopes.
4) One small area had been reseeded
5) Qualitative data only.

ENERGY WEST MINING COMPANY
QUALITATIVE SAMPLING DATA SHEET AND
QUANTITATIVE/QUALITATIVE NOTES
2000

SITE NAME: Refuse Pile & Berm

AREA: Deer Creek (1988 Reveg. Area)

DATE: August 28 - September 3, 2000

WORKERS: P. Collins, D. Collins

SLOPE: 27 deg.

EXPOSURE: NE 300 deg.

AREA: 4.0 acres

ANIMAL USE/DISTURBANCE: Negligible

EROSION: Negligible in most areas.

COVER: (qualitative data only this year)

DOMINANT PLANT SPECIES OBSERVED:

Chrysothamnus nauseosus (B)
Eriogonum corymbosum

Aster chilensis (B)
Halogeton glomeratus
Machaeranthera canescens
Penstemon palmeri
Salsola pestifer

Agropyron cristatum
Bromus inermis
Elymus lanceolatus (B)
Elymus spicatus (B)
Elymus spicatus
Elymus salinus
Elymus cinereus (B)
Hordeum jubatum (B)
Stipa hymenoides (B)

NOTES: 1) Qualitative sampling only was done this year.

2) Like previous years, patchy areas of weeds and some of desirable species.

3) Refuse pile vegetation was considered fair to good for cover and diversity. There was a good representation of forbs and grasses on both exposures. The dominants were rubber rabbitbrush, Palmer penstemon, bluebunch wheatgrass and aster.

4) The berm was dominated by rubber rabbitbrush and bluebunch wheatgrass. Other species observed are shown by a "*(B)*" in the species list above.

ENERGY WEST MINING COMPANY
QUALITATIVE SAMPLING DATA SHEET AND
QUANTITATIVE/QUALITATIVE NOTES
2000

SITE NAME: Rock Slide and Berm

AREA: Deer Creek

DATE: August 28 - September 3, 2000

WORKERS: P. Collins, D. Collins

SLOPE: 53+ deg.

EXPOSURE: W

AREA: .5 acre

ANIMAL USE/DISTURBANCE: Negligible

EROSION: Mostly minor

COVER: (Qualitative data only)

DOMINANT PLANT SPECIES OBSERVED:

Chrysothamnus nauseosus
Eriogonum corymbosum

Aster chilensis
Halogeton glomeratus

Elymus lanceolatus
Elymus cinereus
Elymus spicatus
Elymus salinus

NOTES: 1) Methods: Qualitative data only this year.

2) Berm has good vegetative cover except where the slope has been work on.

4) Fair cover in most areas considering slope angle.

ENERGY WEST MINING COMPANY
QUALITATIVE SAMPLING DATA SHEET AND
QUANTITATIVE/QUALITATIVE NOTES
2000

SITE NAME: Water Plant Slope

AREA: Deer Creek (1988 Reveg. Area)

DATE: August 28 - September 3, 2000

WORKERS: P. Collins, D. Collins

SLOPE: 38 deg.

EXPOSURE: NE

ANIMAL USE/DISTURBANCE:

EROSION: Slight

DOMINANT PLANT SPECIES OBSERVED:

Artemisia tridentata
Chrysothamnus nauseosus
Eriogonum corymbosum
Rosa woodsii

*Aster chilensis**
Machaeranthera canescens
Melilotus officinalis

Agropyron cristatum
Bromus carinatus
*Elymus cinereus**
Elymus smithii
*Elymus spicatus**
Elymus hymenoides
Hordeum jubatum

NOTES:

1) We sampled qualitatively this year.

2) Cover was excellent. Some areas had a fair representation of woody species while other areas had more forbs and grasses.

ENERGY WEST MINING COMPANY
QUALITATIVE SAMPLING DATA SHEET AND
QUANTITATIVE/QUALITATIVE NOTES
2000

SITE NAME: Pipeline

AREA: Deer Creek (1986 Reveg. Area)

DATE: August 28 - September 3, 2000

WORKERS: P. Collins

SLOPE: 5 - 30 deg.

EXPOSURE: Variable

AREA: 3.5 acre

ANIMAL USE/DISTURBANCE: Negligible

EROSION: Negligible

COVER: (Cover not sampled this year) (qualitative data only)

DOMINANT PLANT SPECIES OBSERVED:

Amalanchier utahensis
Artemisia tridentata
Atriplex canescens
Atriplex confertifolia
Chrysothamnus nauseosus
Clematis columbiana
Eriogonum corymbosum
Gutierrezia sarothrae
Juniperus osteosperma
Juniperus scopulorum
Pinus edulis
Populus angustifolia
Rosa woodsii
Salix sp.
Tamarix chinensis

Aster chilensis
Aster foliaceous
Castilleja sp.
Grindelia squarrosa
Halogeton glomeratus
Helianthus annuus
Kochia scoparia
Machaeranthera canescens
Melilotus officinalis
Penstemon palmeri
Salsola pestifer

Elymus cinereus
Bromus tectorum
Elymus lanceolatus
Elymus spicatus
Agropyron cristatum
Elymus hispidus
Bromus tectorum
Elymus smithii
Stipa hymenoides
Hordeum jubatum
Sporobolus airoides

NOTES: 1) Qualitative sampling only was done this year.

2) Most of the area was in excellent shape. There were patchy areas of weeds when the pipeline went near the main road, probably due to road salt.

ENERGY WEST MINING COMPANY
QUALITATIVE SAMPLING DATA SHEET AND
QUANTITATIVE/QUALITATIVE NOTES
2000

SITE NAME: Deer Canyon

AREA: Deer Creek (1986 Reveg. Area)

DATE: August 28 - September 3, 2000

WORKERS: P. Collins

SLOPE: 15-20 deg.

EXPOSURE: E

AREA: .1 acre

ANIMAL USE/DISTURBANCE: Negligible

EROSION: Negligible

COVER: (qualitative data only this year)

DOMINANT PLANT SPECIES OBSERVED:

Chrysothamnus nauseosus

Aster chilensis
Machaeranthera canescens
Penstemon palmeri

Dactylis glomeratus
Elymus spicatus
Elymus lanceolatus
Elymus cinereus
Elymus salinus
Elymus smithii
Poa pratensis
Stipa hymenoides

NOTES: 1) Qualitative sampling only was done this year.

2) Site had excellent and fair diversity.

3) It was dominated by grasses with a fair representation of rubber rabbitbrush.

ENERGY WEST MINING COMPANY
QUALITATIVE SAMPLING DATA SHEET AND
QUANTITATIVE/QUALITATIVE NOTES
2000

SITE NAME: Reference Area (Atriplex)

AREA: Deer Creek Waste Rock

DATE: August 21-25, 2000

WORKERS: P. Collins

SLOPE: 10-20 deg

EXPOSURE: Variable

ANIMAL USE/DISTURBANCE: Moderate

EROSION: N

COVER: (qualitative data only)

DOMINANT PLANT SPECIES OBSERVED:

*Atriplex gardneri**
Atriplex confertifolia
Chrysothamnus nauseosus
Artemisia nova
Eriogonum corymbosum

Halogeton glomeratus

Stipa hymenoides

NOTES: 1) Qualitative sampling this year.

2) Slopes were dominated by Gardner saltbush with patches of mat saltbush.

3) Drainages had more grass and black sagebrush.

ENERGY WEST MINING COMPANY
QUALITATIVE SAMPLING DATA SHEET AND
QUANTITATIVE/QUALITATIVE NOTES
2000

SITE NAME: Access Road Slopes

AREA: Deer Creek Waste Rock Site (1989 Interim Reveg. Area)

DATE: August 21-25, 2000

WORKERS: P. Collins

SLOPE: 20 - 25 deg.

EXPOSURE: Variable

AREA: Part of 5 acres

ANIMAL USE/DISTURBANCE: Negligible

EROSION: Erosion control repair work has been done.

COVER: (no quantitative data recorded this year)

DOMINANT PLANT SPECIES OBSERVED:

Fill Slopes

Artemisia tridentata
Atriplex confertifolia
Atriplex canescens
Atriplex gardneri
Ceratoides lanata
Chrysothamnus nauseosus
Eriogonum corymbosum
Juniperus osteosperma
Yucca harrimaniae
Sarcobatus vermiculatus

Penstemon palmeri

Elymus cinereus
Elymus lanceolatus
Elymus smithii
Sporobolus airoides
Stipa hymenoides

Cut Slopes

Artemisia tridentata
Atriplex canescens
Atriplex confertifolia
Atriplex gardneri
Chrysothamnus nauseosus
Eriogonum corymbosum

Eriogonum subreniforme
Halogeton glomeratus
Salsola pestifer

Elymus lanceolatus
Elymus salinus

NOTES: 1) Qualitative sampling only was done this year.

2) The cut slopes had more weedy species whereas the fill slopes were mostly desirable species.

ENERGY WEST MINING COMPANY
QUALITATIVE SAMPLING DATA SHEET AND
QUANTITATIVE/QUALITATIVE NOTES
2000

SITE NAME: Phase I Berm

AREA: Deer Creek Waste Rock Site (1989 Final Reveg. Area)

DATE: August 21-25, 2000

WORKERS: P. Collins and D. Collins

SLOPE: 0-29 deg.

EXPOSURE: Variable

AREA: 4 Acres

ANIMAL USE/DISTURBANCE: Negligible

EROSION: Negligible

COVER: (See quantitative data this year)

DOMINANT PLANT SPECIES OBSERVED:
Atriplex gardneri
Atriplex canescens
Ceratoides lanata
Chrysothamnus viscidiflorus
Chrysothamnus nauseosus
Sarcobatus vermiculatus

Halogeton glomeratus
Kochia scoparia
Machaeranthera canescens
Malcomia africana
Penstemon palmeri
Salsola pestifer

Agropyron cristatum
Elymus cinereus
Elymus lanceolatus
Elymus salinus
Hordeum jubatum
Poa secunda
Stipa hymenoides

WOODY SPECIES DENSITY:

DENSITY: 2000	Number/Ac
Atriplex corrugata	232.93
Atriplex gardneri	179.17
Atriplex canescens	232.92
Artemisia tridentata	17.92
Chrysothamnus nauseosus	143.34
Ceratoides lanata	161.25
Sarcobatus vermiculatus	107.50
TOTAL	1075.02

BIOMASS PRODUCTION:

PRODUCTION:2000	POUNDS/ACRE
Herbaceous	198.05
Woody	192.58
TOTAL	390.63

NOTES:
1) Qualitative and quantitative sampling was done this year for cover (n=15), density (n=15) and productivity (n=15). Weedy species were not included in the production.
2) Some of the previous years we also sampled the top of the berm. This year, because the map showed it this way, we sampled only the outslopes of the berm. We sampled the 3 faces (south, west and north).
3) There continues to be large patches of areas dominated by weeds. It is difficult to say if this area would meet bond release without actually sampling it and comparing it with the reference area. (~).
4) It seems like some of the berm has improved while other areas have declined.
5) The bottomline is: the south exposure looked poor, west was fair and north was in good condition
6) Some spot-seeding may be appropriate. (~)

ENERGY WEST
Phase I Berm (1989 Final Reveg Area)
Deer Creek Waste Rock Site
Slope: 0-29 deg
Exposure: Variable
Sample Date: 21 Aug - 25 Aug 00

1 thru 6 = South Face

	1.00	2.00	3.00	4.00	5.00	6.00	7.00
SHRUBS							
Atriplex canescens	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Atriplex confertifolia	0.00	0.00	0.00	1.00	0.00	0.00	0.00
Ceratoides lanata	0.00	0.00	0.00	0.00	0.00	5.00	5.00
Chrysothamnus nauseosus	0.00	0.00	0.00	0.00	0.00	5.00	3.00
Sarcobatus vermiculatus	0.00	0.00	0.00	0.00	0.00	0.00	5.00
FORBS							
Halogeton glomeratus	5.00	2.00	0.00	7.00	0.00	0.00	0.00
Malcomia africana	0.00	3.00	0.00	0.00	5.00	0.00	0.00
Machaeranthera grindelioides	0.00	0.00	5.00	0.00	0.00	0.00	0.00
Penstemon palmeri	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Salsola pestifer	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	0.00	0.00
Elymus salinus	0.00	0.00	0.00	0.00	0.00	20.00	0.00
Elymus smithii	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hordeum jubatum	0.00	0.00	0.00	0.00	0.00	0.00	2.00
Stipa hymenoides	0.00	5.00	10.00	7.00	30.00	5.00	0.00
COVER							
Total Living Cover	5.00	10.00	15.00	15.00	35.00	35.00	15.00
Litter	5.00	5.00	5.00	10.00	5.00	5.00	10.00
Bareground	80.00	80.00	70.00	65.00	50.00	50.00	40.00
Rock	10.00	5.00	10.00	10.00	10.00	10.00	35.00
% COMPOSITION							
Shrubs	0.00	0.00	0.00	6.67	0.00	28.57	86.67
Forbs	100.00	50.00	33.33	46.67	14.29	0.00	0.00
Grasses	0.00	50.00	66.67	46.67	85.71	71.43	13.33

7 thru 12 = West Face

13 thru 15 = North Face

8.00	9.00	10.00	11.00	12.00	13.00	14.00	15.00	Mean	SDev
0.00	0.00	5.00	0.00	15.00	0.00	0.00	2.00	1.47	3.84
0.00	0.00	20.00	0.00	0.00	0.00	0.00	0.00	1.40	4.98
0.00	3.00	0.00	0.00	0.00	5.00	17.00	0.00	2.33	4.41
0.00	3.00	0.00	0.00	2.00	0.00	0.00	0.00	0.87	1.54
5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.67	1.70
5.00	0.00	0.00	0.00	0.00	20.00	0.00	0.00	2.60	5.17
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.53	1.41
0.00	0.00	0.00	0.00	3.00	0.00	0.00	3.00	0.73	1.53
0.00	7.00	0.00	0.00	0.00	0.00	0.00	5.00	0.80	2.07
0.00	0.00	0.00	0.00	0.00	0.00	5.00	0.00	0.33	1.25
0.00	0.00	0.00	0.00	0.00	5.00	0.00	5.00	0.67	1.70
0.00	0.00	0.00	0.00	0.00	0.00	0.00	15.00	2.33	6.02
0.00	0.00	10.00	0.00	0.00	0.00	0.00	0.00	0.67	2.49
0.00	0.00	0.00	0.00	0.00	0.00	1.00	5.00	0.53	1.31
0.00	22.00	0.00	7.00	0.00	0.00	2.00	0.00	5.87	8.64
10.00	35.00	35.00	7.00	20.00	30.00	25.00	35.00	21.80	11.17
5.00	3.00	2.00	5.00	5.00	10.00	2.00	2.00	5.27	2.64
80.00	40.00	40.00	85.00	70.00	55.00	70.00	55.00	62.00	15.36
5.00	22.00	23.00	3.00	5.00	5.00	3.00	8.00	10.93	8.67
50.00	17.14	71.43	0.00	85.00	16.67	68.00	5.71	29.06	32.42
50.00	20.00	0.00	0.00	15.00	66.67	20.00	22.86	29.25	27.87
0.00	62.86	28.57	100.00	0.00	16.67	12.00	71.43	41.69	32.63

ENERGY WEST
Phase I Berm (1989 Final Reveg Area)
Deer Creek Waste Rock Site
Slope: 0-29 deg
Exposure: Variable
Sample Date: 21 Aug - 25 Aug 00

Freq	
	SHRUBS
20.00	*Atriplex canescens*
13.33	*Atriplex confertifolia*
33.33	*Ceratoides lanata*
26.67	*Chrysothamnus nauseosus*
13.33	*Sarcobatus vermiculatus*
	FORBS
33.33	*Halogeton glomeratus*
13.33	*Malcomia africana*
20.00	*Machaeranthera grindelioides*
13.33	*Penstemon palmeri*
6.67	*Salsola pestifer*
	GRASSES
13.33	*Elymus lanceolatus*
13.33	*Elymus salinus*
6.67	*Elymus smithii*
20.00	*Hordeum jubatum*
53.33	*Stipa hymenoides*

	COVER
	Total Living Cover
	Litter
	Bareground
	Rock
	% COMPOSITION
	Shrubs
	Forbs
	Grasses

ENERGY WEST MINING COMPANY
QUALITATIVE SAMPLING DATA SHEET AND
QUANTITATIVE/QUALITATIVE NOTES
2000

SITE NAME: Drain Field (Reconstruction `97)

AREA: Deer Creek

DATE: August 28 - September 3, 2000

WORKERS: P. Collins

SLOPE: 2 - 3 deg.

EXPOSURE: N

ANIMAL USE/DISTURBANCE: Used by wildlife

EROSION: Negligible

COVER: (Cover not sampled this year) (est. 20-75% depending on the area)

DOMINANT PLANT SPECIES OBSERVED:

Chrysothamnus nauseosus

Aster chilensis
Astragalus cicer
Cirsium sp.
Grindelia squarrosa
Medicago sativa
Melilotus officinalis
Penstemon palmeri
Xanthium pennsylvanica

Elymus cinereus
Elymus lanceolatus
Elymus spicatus
Elymus smithii
Stipa hymenoides

NOTES: 1) Qualitative sampling this year.

2) To locate it, it is 0.5 miles south of northern riparian area.

3) Site had excellent cover, mostly grasses

ENERGY WEST MINING COMPANY
QUALITATIVE SAMPLING DATA SHEET AND
QUANTITATIVE/QUALITATIVE NOTES
2000

SITE NAME: Phase I Diversion

AREA: Deer Creek Waste Rock Site (1989 Final Reveg. Area)

DATE: August 21-25, 2000

WORKERS: P. Collins

SLOPE: 5 deg.

EXPOSURE: Variable

AREA: 4 acres

ANIMAL USE/DISTURBANCE: Negligible

EROSION: Negligible

COVER: (see quantitative data)

DOMINANT PLANT SPECIES OBSERVED:

Atriplex gardneri
Atriplex confertifolia
Artemisia tridentata
Gutierrezia sarothrae
Sarcobatus vermiculatus

Penstemon palmeri

Agropyron cristatum
Sporobolus airoides
Elymus lanceolatus
Elymus cinereus
Stipa hymenoides

WOODY SPECIES DENSITY:

DENSITY: 2000	Number/Ac
Artemisia tridentata	229.04
Atriplex canescens	801.63
Atriplex gardneri	629.86
Atriplex corrugata	114.52
Atriplex corrugata	687.12
Ceratoides lanata	57.26
Chrysothamnus nauseosus	801.63
Eriogonum corymbosum	57.26
Sarcobatus vermiculatus	57.26
TOTAL	3435.58

BIOMASS PRODUCTION:

PRODUCTION:2000	POUNDS/ACRE
Herbaceous	535.35
Woody	362.42
TOTAL	897.77

NOTES:

1) Site looks better overall.
2) Used random numbers to sample berms.
3) Sampled cover and frequency by ocular methods.
4) Sampled density using the point quarter method.
5) Sampled productivity by clipping, weighing and double sampling.
6) The sample area was assumed to be on the north and west side of the berm. Sample numbers 1-8 were on the north side of berm. About 75% of this area was in excellent shape and 25% (sample numbers 9-15) was poor (west end of north side). (~).
7) Phase I Diversion may meet bond release requirements. (~).

ENERGY WEST
Phase I Diversion (1989 Final Reveg Area)
Deer Creek Waste Rock Site
Slope: 5 deg
Exposure: Variable

Sample Date: 21 Aug - 25 Aug 00	1.00	2.00	3.00	4.00	5.00	6.00	7.00
SHRUBS							
Atriplex canescens	0.00	10.00	0.00	0.00	0.00	0.00	20.00
Atriplex confertifolia	0.00	10.00	0.00	15.00	0.00	0.00	0.00
Atriplex corrugata	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Atriplex gardneri	5.00	0.00	0.00	0.00	10.00	0.00	0.00
Chrysothamnus nauseosus	0.00	10.00	0.00	0.00	0.00	0.00	0.00
FORBS							
Epilobium halleanum	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Halogeton glomeratus	0.00	0.00	0.00	10.00	0.00	0.00	0.00
Penstemon palmeri	0.00	0.00	10.00	0.00	0.00	0.00	0.00
Salsola pestifer	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GRASSES							
Elymus cinereus	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Elymus lanceolatus	0.00	0.00	0.00	5.00	0.00	0.00	10.00
Elymus salinus	0.00	0.00	5.00	0.00	50.00	0.00	15.00
Elymus smithii	0.00	20.00	0.00	0.00	0.00	25.00	0.00
Hordeum jubatum	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sporobolus airoides	50.00	0.00	0.00	0.00	0.00	25.00	0.00
Stipa hymenoides	0.00	0.00	10.00	0.00	0.00	0.00	0.00
COVER							
Total Living Cover	55.00	50.00	25.00	30.00	60.00	50.00	45.00
Litter	4.00	4.00	2.00	10.00	5.00	4.00	9.00
Bareground	40.00	45.00	70.00	55.00	30.00	45.00	45.00
Rock	1.00	1.00	3.00	5.00	5.00	1.00	1.00
% COMPOSITION							
Shrubs	9.09	60.00	0.00	50.00	16.67	0.00	44.44
Forbs	0.00	0.00	40.00	33.33	0.00	0.00	0.00
Grasses	90.91	40.00	60.00	16.67	83.33	100.00	55.56

8.00	9.00	10.00	11.00	12.00	13.00	14.00	15.00	Mean	SDev
0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	2.33	5.44
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.67	4.35
0.00	0.00	30.00	0.00	0.00	0.00	0.00	0.00	2.00	7.48
0.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00	1.33	2.87
0.00	0.00	0.00	0.00	0.00	20.00	2.00	5.00	2.47	5.40
3.00	0.00	0.00	0.00	0.00	0.00	10.00	0.00	0.87	2.55
5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	2.71
0.00	0.00	0.00	10.00	0.00	5.00	8.00	5.00	2.53	3.81
1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.25
0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00	0.67	2.49
0.00	25.00	0.00	0.00	0.00	0.00	0.00	0.00	2.67	6.55
0.00	0.00	0.00	10.00	15.00	10.00	10.00	10.00	8.33	12.47
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.00	7.70
1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.25
0.00	0.00	0.00	5.00	0.00	0.00	5.00	0.00	5.67	13.40
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.67	2.49
10.00	30.00	30.00	25.00	15.00	35.00	35.00	35.00	35.33	13.84
1.00	5.00	1.00	3.00	6.00	5.00	5.00	5.00	4.60	2.42
85.00	40.00	55.00	70.00	75.00	50.00	25.00	45.00	51.67	16.30
4.00	25.00	14.00	2.00	4.00	10.00	35.00	15.00	8.40	9.70
0.00	16.67	100.00	0.00	0.00	57.14	5.71	28.57	25.89	29.18
90.00	0.00	0.00	40.00	0.00	14.29	51.43	14.29	18.89	25.96
10.00	83.33	0.00	60.00	100.00	28.57	42.86	57.14	55.22	31.19

ENERGY WEST
Phase I Diversion (1989 Final Reveg Area)
Deer Creek Waste Rock Site
Slope: 5 deg
Exposure: Variable
Sample Date: 21 Aug - 25 Aug 00

Freq	
	SHRUBS
20.00	*Atriplex canescens*
13.33	*Atriplex confertifolia*
6.67	*Atriplex corrugata*
20.00	*Atriplex gardneri*
26.67	*Chrysothamnus nauseosus*
	FORBS
13.33	*Epilobium halleanum*
13.33	*Halogeton glomeratus*
33.33	*Penstemon palmeri*
6.67	*Salsola pestifer*
	GRASSES
6.67	*Elymus cinereus*
20.00	*Elymus lanceolatus*
53.33	*Elymus salinus*
13.33	*Elymus smithii*
6.67	*Hordeum jubatum*
26.67	*Sporobolus airoides*
6.67	*Stipa hymenoides*
	COVER
	Total Living Cover
	Litter
	Bareground
	Rock
	% COMPOSITION
	Shrubs
	Forbs
	Grasses

COLOR
PHOTOGRAPHS

Deer Creek - Riparian Reference Area

Deer Creek - Mix Conifer Reference Area

Deer Creek - PJ Reference Area

Deer Creek - C2 Conveyor (East Side) '93

Deer Creek - C2 Conveyor (Behind Beltline)

Deer Creek - Riparian Areas (North)

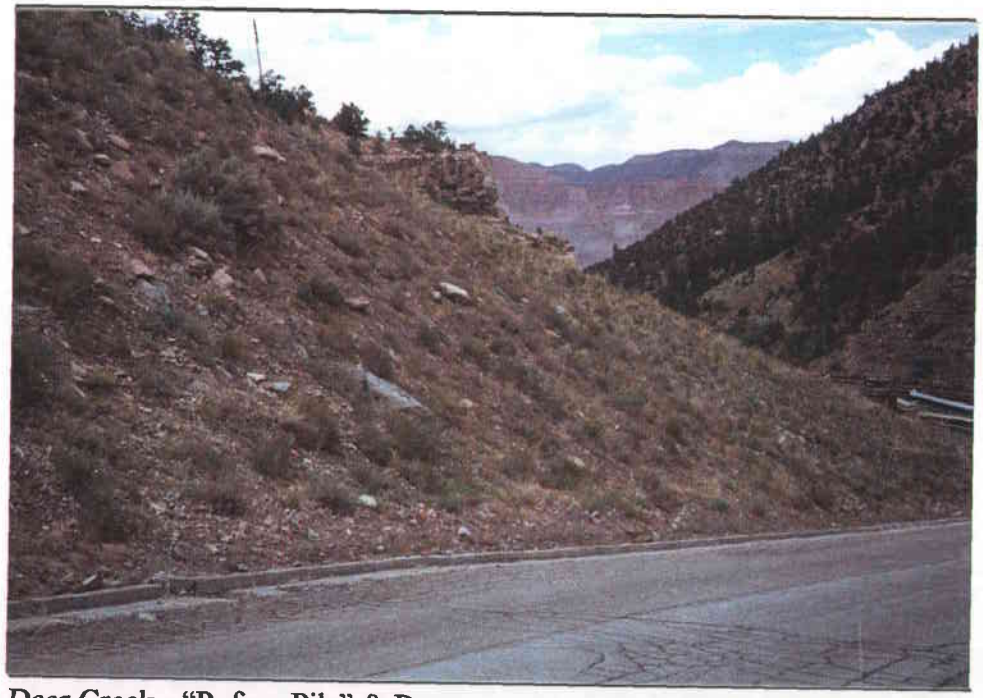
Deer Creek - Sediment Pond Dam

Deer Creek - Temp. Sediment Basin

Deer Creek - Roadside Areas

Deer Creek - Gate Areas Slope

Deer Creek - Fan Road Slopes



Deer Creek - "Refuse Pile" & Berm

Deer Creek - Refuse Pile & "Berm"

Deer Creek - Rock Slide & Berm

Deer Creek - Water Plant Slopes

Deer Creek - Pipeline (1 of 2)

Deer Creek - Pipeline (2 of 2)

Deer Creek - Deer Canyon

Deer Creek - Waste Rock Reference Area (Atriplex)

Deer Creek - Waste Rock Access Road Slopes

Deer Creek - Phase I Berm '89

Deer Creek - Drain Field '97

Deer Creek - Phase I Diversion (North) '89

Deer Creek - Phase I Diversion (West) '89

TRAIL MOUNTAIN MINE AREA

ENERGY WEST MINING COMPANY
QUALITATIVE SAMPLING DATA SHEET AND
QUANTITATIVE/QUALITATIVE NOTES
2000

SITE NAME: Reference Area (Grassland/Shrub)

AREA: Trail Mountain Mine

DATE: August 28 - September 1, 2000

WORKERS: P. Collins, D. Collins

EXPOSURE: W

ANIMAL USE/DISTURBANCE: Yes, normal conditions

EROSION: Negligible

COVER: (No quantitative data recorded this year)

DOMINANT PLANT SPECIES OBSERVED:

Amalanchier utahensis
Atriplex confertifolia
Chrysothamnus nauseosus
Ephedra viridis
Eriogonum corymbosum
Juniperus osteosperma

Achillea millefolium
Aster foliaceus
Astragalus spp.
Linum lewisii
Penstemon spp.
Lomatium nuttallii

*Elymus salinus**
Stipa hymenoides

NOTES:
1) Recorded qualitative data only.
2) Found one white stake at the base of the sandstone cliffs.
3) Site looked excellent.
4) Recorded data observing from the toe of cut slope.

ENERGY WEST MINING COMPANY
QUALITATIVE SAMPLING DATA SHEET AND
QUANTITATIVE/QUALITATIVE NOTES
2000

SITE NAME: Sediment Pond Outslope

AREA: Trail Mountain Mine Area

DATE: August 28 - September 1, 2000

WORKERS: P. Collins, D. Collins

SLOPE: 25 deg.

EXPOSURE: E&S

ANIMAL USE/DISTURBANCE: Slight

EROSION: Slight

COVER: (no quantitative data recorded this year)

DOMINANT PLANT SPECIES OBSERVED:

Atriplex confertifolia
Artemisia tridentata
Brickelia microphylla
Chrysothamnus nauseosus
Gutierrezia sarothrae

Aster foliaceus
Halogeton glomeratus

Agropyron cristatum
Elymus cinereus

NOTES:

1) Qualitative sampling only was done this year.

2) The north side of the outslope was dominated by halogeton and almost no desirable species (~).

3) The boulder area was dominated by aster, while the other areas were dominated by grasses.

ENERGY WEST MINING COMPANY
QUALITATIVE SAMPLING DATA SHEET AND
QUANTITATIVE/QUALITATIVE NOTES
2000

SITE NAME: Parking Lot Extension (`96)

AREA: Trail Mountain Mine Area

DATE: August 28 - September 1, 2000

WORKERS: P. Collins, D. Collins

SLOPE: 20 deg.

EXPOSURE: NW

ANIMAL USE/DISTURBANCE: Negligible

EROSION: Slight

COVER: (no quantitative data recorded this year)

DOMINANT PLANT SPECIES OBSERVED:

Aster foliaceus
Astragalus cicer

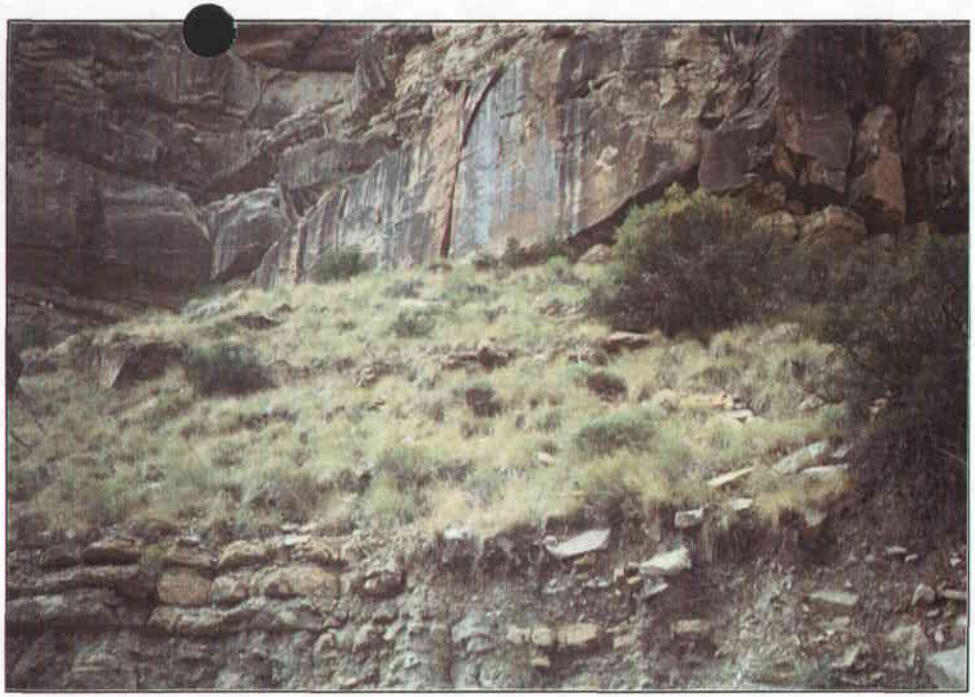
*Elymus cinereus**
Elymus lanceolatus
Poa secunda

* dominant species

NOTES: 1) Qualitative sampling only was done this year.

2) Silt fences remain in good condition.

COLOR
PHOTOGRAPHS



Trail Mountain Mine - Reference Area

Trail Mountain Mine - Sediment Pond Outslope '93

Trail Mountain Mine - Parking Lot Extension '96

COTTONWOOD CANYON AREA

ENERGY WEST MINING COMPANY
QUALITATIVE SAMPLING DATA SHEET AND
QUANTITATIVE/QUALITATIVE NOTES
2000

SITE NAME: Reclaimed Slope (old,`81)

AREA: Cottonwood Fan Portal Area

DATE: August 28 - September 1, 2000

WORKERS: P. Collins, D. Collins

SLOPE: 35 deg.

EXPOSURE: W

ANIMAL USE/DISTURBANCE: Slight to moderate

EROSION: Slight, natural patterns.

COVER: (see quantitative data)

DOMINANT PLANT SPECIES OBSERVED:

Artemisia tridentata
Atriplex canescens
Atriplex confertifolia
Chrysothamnus nauseosus

Aster foliaceous

Agropyron cristatum
Elymus lanceolatus
Elymus salinus
Elymus junceus
Elymus cinereus

WOODY SPECIES DENSITY:

DENSITY: 2000	**Number/Ac**
Artemisia tridentata	1614.56
Atriplex canescens	387.49
Chrysothamnus nauseosus	581.24
TOTAL	2583.29

BIOMASS PRODUCTION:

PRODUCTION:2000	POUNDS/ACRE
Herbaceous	627.50
Woody	700.53
TOTAL	1327.84

NOTES: 1) Area continues to look excellent.

2) Took quantitative data on nearly entire length of slope using transect lines for cover (n=20), density (n=20) and productivity (n=20). At 20 ft intervals we sampled with random numbers.

3) There were lots of small sagebrush seedlings that sprouted this year.

4) These data could be used to run adequacy formulas for future bond release planning. (~)

5) Qualitative sampling was also taken.

ENERGY WEST
Reclaimed Slope ' 81 (Final)
Cottonwood Fan Portal
Slope: 35 deg
Exposure: West

Sample Date: 28 Aug - 1 Sept 00	1.00	2.00	3.00	4.00	5.00	6.00	7.00
SHRUBS							
Artemisia tridentata	15.00	5.00	65.00	25.00	5.00	5.00	0.00
Atriplex canescens	0.00	0.00	0.00	0.00	0.00	0.00	25.00
Chrysothamnus nauseosus	15.00	0.00	0.00	0.00	5.00	0.00	0.00
FORBS							
Aster foliaceus	5.00	5.00	0.00	0.00	30.00	0.00	5.00
GRASSES							
Agropyron cristatum	0.00	0.00	0.00	10.00	0.00	0.00	15.00
Elymus cinereus	0.00	15.00	5.00	10.00	10.00	15.00	5.00
Elymus salinus	0.00	0.00	0.00	0.00	0.00	5.00	0.00
Elymus junceus	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Elymus lanceolatus	0.00	0.00	0.00	0.00	5.00	0.00	0.00
COVER							
Total Living Cover	35.00	25.00	70.00	45.00	55.00	25.00	50.00
Litter	25.00	45.00	15.00	5.00	5.00	15.00	30.00
Bareground	15.00	10.00	5.00	25.00	5.00	5.00	10.00
Crypto	0.00	0.00	0.00	0.00	5.00	0.00	0.00
Rock	25.00	20.00	10.00	25.00	30.00	55.00	10.00
% COMPOSITION							
Shrubs	85.71	20.00	92.86	55.56	18.18	20.00	50.00
Forbs	14.29	20.00	0.00	0.00	54.55	0.00	10.00
Grasses	0.00	60.00	7.14	44.44	27.27	80.00	40.00

8.00	9.00	10.00	11.00	12.00	13.00	14.00	15.00	16.00	17.00
25.00	0.00	10.00	0.00	40.00	10.00	0.00	5.00	10.00	0.00
0.00	55.00	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	5.00	0.00	0.00
0.00	5.00	0.00	0.00	0.00	20.00	*5.00*	5.00	0.00	5.00
15.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5.00	5.00	0.00	10.00	0.00	0.00	20.00	0.00	45.00	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	15.00	10.00	0.00	5.00	0.00	10.00	0.00	10.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
45.00	65.00	25.00	20.00	40.00	35.00	25.00	25.00	55.00	60.00
10.00	10.00	30.00	10.00	45.00	50.00	15.00	10.00	5.00	10.00
10.00	10.00	15.00	25.00	5.00	5.00	10.00	15.00	5.00	10.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
35.00	15.00	30.00	45.00	10.00	10.00	50.00	50.00	35.00	20.00
55.56	84.62	40.00	0.00	100.00	28.57	0.00	40.00	18.18	33.33
0.00	7.69	0.00	0.00	0.00	57.14	20.00	20.00	0.00	8.33
44.44	7.69	60.00	100.00	0.00	14.29	80.00	40.00	81.82	58.33

ENERGY WEST
Reclaimed Slope ' 81 (Final)
Cottonwood Fan Portal
Slope: 35 deg
Exposure: West
Sample Date: 28 Aug - 1 Sept 00

18.00	19.00	20.00	Mean	SDev	Freq	
						SHRUBS
15.00	0.00	0.00	11.75	16.07	65.00	*Artemisia tridentata*
0.00	10.00	0.00	5.50	13.31	20.00	*Atriplex canescens*
15.00	0.00	0.00	2.00	4.58	20.00	*Chrysothamnus nauseosus*
						FORBS
0.00	0.00	0.00	4.25	7.46	45.00	*Aster foliaceus*
						GRASSES
0.00	0.00	0.00	2.00	4.85	15.00	*Agropyron cristatum*
0.00	35.00	15.00	11.00	12.10	70.00	*Elymus cinereus*
0.00	0.00	0.00	0.25	1.09	5.00	*Elymus salinus*
10.00	15.00	10.00	4.25	5.54	40.00	*Elymus junceus*
0.00	0.00	0.00	0.25	1.09	5.00	*Elymus lanceolatus*
						COVER
40.00	60.00	25.00	41.25	15.32		Total Living Cover
10.00	5.00	10.00	18.00	14.09		Litter
20.00	5.00	40.00	12.50	8.87		Bareground
0.00	0.00	0.00	0.25	1.09		Crypto
30.00	30.00	25.00	28.00	13.64		Rock
						% COMPOSITION
75.00	16.67	0.00	41.71	31.22		Shrubs
0.00	0.00	0.00	10.60	16.77		Forbs
25.00	83.33	100.00	47.69	31.93		Grasses

ENERGY WEST MINING COMPANY
QUALITATIVE SAMPLING DATA SHEET AND
QUANTITATIVE/QUALITATIVE NOTES
2000

SITE NAME: Soil Piles

AREA: Cottonwood Fan Portal Area

DATE: August 28 - September 1, 2000

WORKERS: P. Collins, D. Collins

SLOPE: 35 deg.

EXPOSURE: Variable

ANIMAL USE/DISTURBANCE:

EROSION: Negligible

COVER: (Cover not sampled this year)

DOMINANT PLANT SPECIES OBSERVED:

Artemisia tridentata
Atriplex canescens
Atriplex confertifolia
Brickellia scabra
Chrysothamnus nauseosus
Eriogonum corymbosum
Symphoricarpos oreophilus

Aster foliaceous

Agropyron cristatum
Elymus cinereus
Elymus lanceolatus
Elymus smithii
Elymus elymoides
Elymus junceus
Stipa hymenoides

NOTES:
1) Recorded only qualitative data this year.
2) Topsoil and subsoil piles had nearly the same species present.
3) Sites looked excellent with good diversity.

ENERGY WEST MINING COMPANY
QUALITATIVE SAMPLING DATA SHEET AND
QUANTITATIVE/QUALITATIVE NOTES
2000

SITE NAME: Reference Area

AREA: Cottonwood Fan Portal Area

DATE: August 28 - September 1, 2000

WORKERS: P. Collins, D. Collins

SLOPE: 33 deg.

EXPOSURE: W

ANIMAL USE/DISTURBANCE: Slight to moderate

EROSION: Slight, natural patterns.

COVER: (see quantitative data)

DOMINANT PLANT SPECIES OBSERVED:

Amalanchier utahensis
Atriplex confertifolia
Chrysothamnus nauseosus
Ephedra viridis
Juniperus osteosperma
Mahonia repens
Pinus edulis

Cryptantha sp.
Galium bifolium
Stanleya pinnata
Machaeranthera canescens

Elymus salinus
Stipa hymenoides

WOODY SPECIES DENSITY:

DENSITY: 2000	Number/Ac
Amalanchier utahensis	81.48
Atriplex confertifolia	48.89
Cercocarpus montanus	16.30
Chrysothamnus nauseosus	342.22
Ephedra viridis	130.37
Eriogonum corymbosum	48.89
Juniperus osteosperma	97.78
Mahonia repens	179.26
Pinus edulis	358.52
TOTAL	

BIOMASS PRODUCTION:

PRODUCTION:2000	POUNDS/ACRE
Herbaceous	483.25
Woody	466.67
TOTAL	943.98

NOTES:
1) Quantitative data - recorded cover (n=20); density (n=20); production [n=10 (40)].
2) Placed one long and one short transect line to represent the area. Sampled randomly every 10 ft.
3) Reference Area continues to look excellent.
4) Recorded Oregon grape as a woody species which would change the standard deviation a lot.
5) Qualitative data were also taken.

ENERGY WEST
Reference Area
Cottonwood Fan Portal Area
Slope: 33 deg
Exposure: West

Sample Date: 28 Aug - 1 Sept 00	1.00	2.00	3.00	4.00	5.00	6.00	7.00
OVERSTORY							
Juniperus osteosperma	25.00	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
UNDERSTORY							
SHRUBS							
Amalanchier utahensis	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cercocarpus montanus	2.00	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	5.00
Ephedra viridis	0.00	0.00	0.00	0.00	10.00	0.00	0.00
Juniperus osteosperma	9.00	0.00	0.00	0.00	0.00	0.00	0.00
Mahonia repens	0.00	0.00	0.00	0.00	0.00	0.00	5.00
Pinus edulis	5.00	0.00	0.00	0.00	0.00	0.00	0.00
FORBS							
Cryptantha sp.	0.00	0.00	0.00	0.00	0.00	0.00	5.00
Machaeranthera canescens	0.00	0.00	0.00	5.00	0.00	0.00	0.00
Stanleya pinnata	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GRASSES							
Elymus salinus	9.00	10.00	20.00	30.00	25.00	25.00	5.00
Stipa hymenoides	0.00	0.00	0.00	0.00	5.00	0.00	0.00
COVER							
Overstory Cover (o)	25.00	0.00	0.00	0.00	0.00	0.00	0.00
Understory Cover (u)	25.00	10.00	20.00	35.00	40.00	25.00	20.00
Litter	5.00	25.00	10.00	5.00	5.00	25.00	5.00
Bareground	20.00	40.00	20.00	20.00	20.00	5.00	10.00
Rock	50.00	25.00	50.00	40.00	35.00	45.00	65.00
% UNDERSTORY COMPOSITION							
Shrubs	64.00	0.00	0.00	0.00	25.00	0.00	50.00
Forbs	0.00	0.00	0.00	14.29	0.00	0.00	25.00
Grasses	36.00	100.00	100.00	85.71	75.00	100.00	25.00
TOTAL LIVING COVER (o+u)	50.00	10.00	20.00	35.00	40.00	25.00	20.00

8.00	9.00	10.00	11.00	12.00	13.00	14.00	15.00	16.00	17.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	35.00	0.00	0.00	0.00	0.00	0.00	20.00	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	0.00	0.00
0.00	0.00	1.00	0.00	7.00	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	7.00	0.00	0.00	7.00	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	3.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	4.00	1.00	0.00	0.00	0.00	0.00	0.00	10.00
5.00	15.00	30.00	7.00	30.00	15.00	25.00	45.00	20.00	25.00
0.00	0.00	0.00	0.00	3.00	5.00	0.00	0.00	0.00	0.00
0.00	0.00	35.00	0.00	0.00	0.00	0.00	0.00	20.00	0.00
10.00	20.00	35.00	15.00	40.00	35.00	35.00	45.00	20.00	35.00
10.00	15.00	10.00	5.00	10.00	20.00	10.00	15.00	5.00	25.00
25.00	10.00	40.00	10.00	10.00	5.00	35.00	5.00	20.00	20.00
55.00	55.00	15.00	70.00	40.00	40.00	20.00	35.00	55.00	20.00
50.00	25.00	2.86	46.67	17.50	42.86	20.00	0.00	0.00	0.00
0.00	0.00	11.43	6.67	0.00	0.00	8.57	0.00	0.00	28.57
50.00	75.00	85.71	46.67	82.50	57.14	71.43	100.00	100.00	71.43
10.00	20.00	70.00	15.00	40.00	35.00	35.00	45.00	40.00	35.00

ENERGY WEST
Reference Area
Cottonwood Fan Portal Area
Slope: 33 deg
Exposure: West
Sample Date: 28 Aug - 1 Sept 00

18.00	19.00	20.00	Mean	SDev	Freq	
						OVERSTORY
0.00	0.00	0.00	1.25	5.45	5.00	*Juniperus osteosperma*
0.00	15.00	0.00	3.50	8.96	15.00	*Pinus edulis*
						UNDERSTORY
						SHRUBS
0.00	0.00	0.00	0.50	1.50	10.00	*Amalanchier utahensis*
0.00	0.00	0.00	0.10	0.44	5.00	Cercocarpus montanus
10.00	0.00	0.00	1.15	2.73	20.00	*Chrysothamnus nauseosus*
0.00	0.00	0.00	1.00	3.00	10.00	*Ephedra viridis*
0.00	0.00	0.00	0.45	1.96	5.00	*Juniperus osteosperma*
0.00	0.00	0.00	0.95	2.29	15.00	*Mahonia repens*
0.00	0.00	0.00	0.50	1.50	10.00	*Pinus edulis*
						FORBS
0.00	0.00	0.00	0.40	1.24	10.00	*Cryptantha sp.*
0.00	0.00	0.00	0.25	1.09	5.00	*Machaeranthera canescens*
0.00	0.00	0.00	0.75	2.30	15.00	*Stanleya pinnata*
						GRASSES
15.00	10.00	25.00	19.55	10.15	100.00	*Elymus salinus*
0.00	10.00	0.00	1.15	2.57	20.00	*Stipa hymenoides*
						COVER
0.00	15.00	0.00	4.75	10.06		Overstory
25.00	20.00	25.00	26.75	9.91		Understory
20.00	10.00	20.00	12.75	7.15		Litter
10.00	20.00	5.00	17.50	10.78		Bareground
45.00	50.00	50.00	43.00	14.44		Rock
						% COMPOSITION
40.00	0.00	0.00	19.19	21.57		Shrubs
0.00	0.00	0.00	4.73	8.51		Forbs
60.00	100.00	100.00	76.08	23.08		Grasses
25.00	35.00	25.00				

ENERGY WEST MINING COMPANY
QUALITATIVE SAMPLING DATA SHEET AND
QUANTITATIVE/QUALITATIVE NOTES
2000

SITE NAME: CFP Tube Conveyor Area (1996 Seeding)

AREA: Trail Mtn. Mine/Cottonwood Fan Portal Area

DATE: August 28 - September 1, 2000

WORKERS: P. Collins, D. Collins

SLOPE: 28 deg.

EXPOSURE: W, N, S.

ANIMAL USE/DISTURBANCE: None

EROSION: Negligible. Rocks in area seem to be greatly enhancing erosion control.

COVER: (see quantitative data)

DOMINANT PLANT SPECIES OBSERVED:

Aster foliaceus
Hedysarum boreale
Salsola pestifer
Melilotus officinalis

Elymus spicatus
Elymus lanceolatus
Elymus cinereus
Elymus smithii
Stipa hymenoides

NOTES:

1) We sampled randomly over area for cover (n=10).

2) This year the area was represented mostly by a few grasses and yellow sweetclover, but some shrubs were becoming established (there were a lot of new fourwing saltbush.

3) In 1997 the area was dominated by yellow sweetclover, whereas 1998 we didn't see much of it. There was a lot in 1999 and 2000. Some areas were dominated by almost exclusively yellow sweetclover whereas other areas by grasses.

ENERGY WEST
CPF Tube Conveyor Area (' 96 Seeding)
Cottonwood Fan Portal Area
Slope: 28 deg
Exposure: West, North, South

Sample Date: 28 Aug - 1 Sept 00	1.00	2.00	3.00	4.00	5.00	6.00	7.00
SHRUBS							
Atriplex canescens	0.00	0.00	0.00	0.00	0.00	10.00	0.00
Atriplex confertifolia	0.00	0.00	0.00	25.00	0.00	0.00	0.00
FORBS							
Aster foliaceus	15.00	0.00	5.00	0.00	0.00	0.00	5.00
Melilotus officinalis	14.00	30.00	10.00	0.00	5.00	5.00	25.00
Salsola pestifer	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GRASSES							
Elymus cinereus	0.00	5.00	5.00	0.00	5.00	10.00	0.00
Elymus lanceolatus	0.00	0.00	0.00	20.00	0.00	0.00	0.00
Elymus smithii	5.00	0.00	15.00	5.00	5.00	5.00	0.00
Stipa hymenoides	1.00	0.00	0.00	10.00	25.00	10.00	0.00
COVER							
Total Living Cover	35.00	35.00	35.00	60.00	40.00	40.00	30.00
Litter	5.00	5.00	10.00	5.00	10.00	10.00	5.00
Bareground	35.00	40.00	25.00	25.00	35.00	30.00	35.00
Rock	25.00	20.00	30.00	10.00	15.00	20.00	30.00
% COMPOSITION							
Shrubs	0.00	0.00	0.00	41.67	0.00	25.00	0.00
Forbs	82.86	85.71	42.86	0.00	12.50	12.50	100.00
Grasses	17.14	14.29	57.14	58.33	87.50	62.50	0.00

ENERGY WEST
CPF Tube Conveyor Area (
Cottonwood Fan Portal Area
Slope: 28 deg
Exposure: West, North, South
Sample Date: 28 Aug - 1 Sept 00

8.00	9.00	10.00	Mean	SDev	Freq	
						SHRUBS
0.00	20.00	0.00	3.00	6.40	20.00	*Atriplex canescens*
0.00	0.00	0.00	2.50	7.50	10.00	*Atriplex confertifolia*
						FORBS
5.00	0.00	0.00	3.00	4.58	40.00	*Aster foliaceus*
30.00	15.00	5.00	13.90	10.44	90.00	*Melilotus officinalis*
0.00	5.00	0.00	0.50	1.50	10.00	*Salsola pestifer*
						GRASSES
0.00	0.00	10.00	3.50	3.91	50.00	*Elymus cinereus*
0.00	0.00	20.00	4.00	8.00	20.00	*Elymus lanceolatus*
0.00	0.00	20.00	5.50	6.50	60.00	*Elymus smithii*
0.00	0.00	0.00	4.60	7.84	40.00	*Stipa hymenoides*
						COVER
35.00	40.00	55.00	40.50	9.07		Total Living Cover
5.00	10.00	10.00	7.50	2.50		Litter
35.00	40.00	10.00	31.00	8.60		Bareground
25.00	10.00	25.00	21.00	7.00		Rock
						% COMPOSITION
0.00	50.00	0.00	11.67	18.71		Shrubs
100.00	50.00	9.09	49.55	37.93		Forbs
0.00	0.00	90.91	38.78	34.57		Grasses

ENERGY WEST MINING COMPANY
QUALITATIVE SAMPLING DATA SHEET AND
QUANTITATIVE/QUALITATIVE NOTES
2000

SITE NAME: Belt Portal (`96)

AREA: Cottonwood Fan Portal Area

DATE: August 28 - September 1, 2000

WORKERS: P. Collins, D. Collins

SLOPE: Variable deg.

EXPOSURE: SSW

ANIMAL USE/DISTURBANCE: Slight

EROSION: Slight

COVER: (see quantitative data)

DOMINANT PLANT SPECIES OBSERVED:

Artemisia tridentata
Chrysothamnus nauseosus
Rosa woodsii

Elymus cinereus
Elymus salinus

NOTES: 1) Qualitative and quantitative sampling in 2000.

2) Methods: Sampled for cover only using random sample methods (n=10).

3) Site looked very good.

4) Some areas was almost exclusively Gt. Basin Wildrye.

5) Large boulders greatly enhanced erosion control.

ENERGY WEST
Belt Portal (' 96)
Cottonwood Fan Portal Area
Slope: Variable deg
Exposure: South, South West

Sample Date: 28 Aug - 1 Sept 00	1.00	2.00	3.00	4.00	5.00	6.00	7.00
SHRUBS							
Chrysothamnus nauseosus	0.00	0.00	25.00	0.00	10.00	0.00	0.00
Eriogonum corymbosum	0.00	10.00	0.00	0.00	0.00	0.00	0.00
Rosa woodsii	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FORBS							
Apocynum cannabinum	0.00	0.00	0.00	0.00	0.00	0.00	15.00
Aster foliaceus	25.00	0.00	0.00	0.00	0.00	0.00	0.00
Solidago sp.	0.00	0.00	0.00	0.00	0.00	5.00	0.00
GRASSES							
Elymus cinereus	35.00	30.00	10.00	45.00	25.00	10.00	55.00
Elymus lanceolatus	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Elymus salinus	0.00	0.00	10.00	0.00	0.00	0.00	0.00
COVER							
Total Living Cover	60.00	40.00	45.00	45.00	35.00	15.00	70.00
Litter	5.00	10.00	15.00	25.00	10.00	15.00	5.00
Bareground	10.00	30.00	10.00	5.00	5.00	15.00	15.00
Rock	25.00	20.00	30.00	25.00	50.00	55.00	10.00
% COMPOSITION							
Shrubs	0.00	25.00	55.56	0.00	28.57	0.00	0.00
Forbs	41.67	0.00	0.00	0.00	0.00	33.33	21.43
Grasses	58.33	75.00	44.44	100.00	71.43	66.67	78.57

ENERGY WEST
Belt Portal (' 96)
Cottonwood Fan Portal Area
Slope: Variable deg
Exposure: South, South West
Sample Date: 28 Aug - 1 Sept 00

8.00	9.00	10.00	Mean	SDev	Freq	
						SHRUBS
5.00	0.00	15.00	5.50	8.20	40.00	*Chrysothamnus nauseosus*
0.00	0.00	0.00	1.00	3.00	10.00	*Eriogonum corymbosum*
5.00	10.00	0.00	1.50	3.20	20.00	*Rosa woodsii*
						FORBS
0.00	0.00	0.00	1.50	4.50	10.00	*Apocynum cannabinum*
0.00	0.00	0.00	2.50	7.50	10.00	*Aster foliaceus*
0.00	0.00	0.00	0.50	1.50	10.00	*Solidago sp.*
						GRASSES
25.00	45.00	15.00	29.50	14.74	100.00	*Elymus cinereus*
0.00	0.00	5.00	0.50	1.50	10.00	*Elymus lanceolatus*
0.00	5.00	0.00	1.50	3.20	20.00	*Elymus salinus*
						COVER
35.00	60.00	35.00	44.00	15.13		Total Living Cover
10.00	10.00	10.00	11.50	5.50		Litter
40.00	15.00	40.00	18.50	12.66		Bareground
15.00	15.00	15.00	26.00	14.46		Rock
						% COMPOSITION
28.57	16.67	42.86	19.72	18.89		Shrubs
0.00	0.00	0.00	9.64	15.42		Forbs
71.43	83.33	57.14	70.63	14.64		Grasses

ENERGY WEST MINING COMPANY
QUALITATIVE SAMPLING DATA SHEET AND
QUANTITATIVE/QUALITATIVE NOTES
2000

SITE NAME: Portal Diesel (`96)

AREA: Cottonwood Fan Portal Area

DATE: August 28 - September 1, 2000

WORKERS: P. Collins, D. Collins

SLOPE: 43 deg.

EXPOSURE: SW

ANIMAL USE/DISTURBANCE: Slight

EROSION: Negligible

COVER: (see quantitative data)

DOMINANT PLANT SPECIES OBSERVED:

Chrysothamnus nauseosus

Astragalus cicer
Aster foliaceus
Melilotus officinales

Elymus cinereus
Elymus junceus
Elymus smithii
Elymus lanceolatus
Stipa hymenoides

NOTES:

1) Methods: Steep, dangerous area so we had to estimate our quadrats and belts from a distance.

2) Sampled cover by long distance methods (n=6).

3) Site looked very good.

4) Site was dominated by grasses with some forbs and shrubs.

ENERGY WEST
Portal Diesel (' 96)
Cottonwood Fan Portal Area
Slope: 43 deg
Exposure: South West
Sample Date: 28 Aug - 1 Sept 00

	1.00	2.00	3.00	4.00	5.00	6.00	Mean
SHRUBS							
Chrysothamnus nauseosus	0.00	0.00	0.00	0.00	0.00	10.00	1.67
FORBS							
Aster foliaceus	0.00	10.00	0.00	0.00	0.00	0.00	1.67
Astragalus cicer	0.00	0.00	0.00	0.00	5.00	5.00	1.67
Melilotus officinalis	0.00	0.00	5.00	0.00	0.00	0.00	0.83
GRASSES							
Elymus cinereus	0.00	10.00	10.00	0.00	5.00	10.00	5.83
Elymus lanceolatus	25.00	15.00	20.00	20.00	5.00	10.00	15.83
Elymus smithii	5.00	10.00	15.00	20.00	5.00	0.00	9.17
Stipa hymenoides	0.00	0.00	0.00	0.00	10.00	0.00	1.67
COVER							
Total Living Cover	30.00	45.00	50.00	40.00	30.00	35.00	38.33
Litter	10.00	15.00	5.00	10.00	15.00	10.00	10.83
Bareground	40.00	10.00	30.00	40.00	40.00	10.00	28.33
Rock	20.00	30.00	15.00	10.00	15.00	45.00	22.50
% COMPOSITION							
Shrubs	0.00	0.00	0.00	0.00	0.00	28.57	4.76
Forbs	0.00	22.22	10.00	0.00	16.67	14.29	10.53
Grasses	100.00	77.78	90.00	100.00	83.33	57.14	84.71

ENERGY WEST
Portal Diesel (' 96)
Cottonwood Fan Portal Area
Slope: 43 deg
Exposure: South West
Sample Date: 28 Aug - 1 Sept 00

SDev	Freq	
		SHRUBS
3.73	16.67	*Chrysothamnus nauseosus*
		FORBS
3.73	16.67	*Aster foliaceus*
2.36	33.33	*Astragalus cicer*
1.86	16.67	*Melilotus officinalis*
		GRASSES
4.49	66.67	*Elymus cinereus*
6.72	100.00	*Elymus lanceolatus*
6.72	83.33	*Elymus smithii*
3.73	16.67	*Stipa hymenoides*

	COVER
7.45	Total Living Cover
3.44	Litter
13.44	Bareground
11.81	Rock
	% COMPOSITION
10.65	Shrubs
8.27	Forbs
14.75	Grasses

ENERGY WEST MINING COMPANY
QUALITATIVE SAMPLING DATA SHEET AND
QUANTITATIVE/QUALITATIVE NOTES
2000

SITE NAME: Reclaimed Slope (Final) `98

AREA: Cottonwood Fan Portal Area

DATE: August 28 - September 1, 2000

WORKERS: P. Collins, D. Collins

SLOPE: variable

EXPOSURE: SW

ANIMAL USE/DISTURBANCE: Slight

EROSION: Negligible

COVER: (see quantitative data)

DOMINANT PLANT SPECIES OBSERVED:

Aster chilensis
Helianthus annuus
Triticum aestivum
Linum lewisii
Melilotus officinalis
Malcomia africana
Penstemon palmeri
Salsola pestifer

Agropyron cristatum
Elymus lanceolatus
Elymus salinus
Elymus junceus
Elymus cinereus
Elymus smithii
Elymus spicatus
Elymus elymoides
Avena fatua

WOODY SPECIES DENSITY:

DENSITY: 2000	Number/Ac
Artemisia tridentata	35.10
Atriplex canescens	965.37
Chrysothamnus nauseosus	52.66
TOTAL	1053.14

NOTES:

1) Some of the grasses were difficult to identify due to their size and development. However, there was quite a lot of grass growth.

2) Site looked very good.

4) The area near the portal had straw with plastic netting covering it. The vegetation appeared less mature here. There were no gouges. The planting methods appeared different than other areas.

5) Also sampled quantitatively for cover (n=15) and woody species density (n=15).

6) There were quite a few small shrubs that germinated this year.

7) Generally, the site looked better this year with fewer weeds.

8) I need to get a map that shows this area better for next year.

ENERGY WEST
Reclaimed Slope ' 98 (Final)
Cottonwood Fan Portal Area
Slope: Variable deg
Exposure: South West

Sample Date: 28 Aug - 1 Sept 00	1.00	2.00	3.00	4.00	5.00	6.00	7.00
SHRUBS							
Atriplex canescens	0.00	5.00	0.00	0.00	0.00	0.00	0.00
Artemisia tridentata	0.00	1.00	0.00	0.00	0.00	0.00	0.00
Chrysothamnus nauseosus	0.00	0.00	0.00	5.00	0.00	0.00	0.00
FORBS							
Achillea millefolium	0.00	0.00	0.00	0.00	2.00	0.00	0.00
Aster chilensis	0.00	0.00	0.00	0.00	5.00	3.00	0.00
Linum lewisii	5.00	0.00	0.00	0.00	0.00	0.00	0.00
Melilotus officinalis	20.00	0.00	25.00	5.00	1.00	0.00	5.00
Penstemon palmeri	0.00	0.00	5.00	0.00	4.00	2.00	0.00
Salsola pestifer	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GRASSES							
Agropyron cristatum	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Elymus cinereus	5.00	0.00	5.00	0.00	0.00	15.00	0.00
Elymus lanceolatus	5.00	5.00	0.00	5.00	3.00	0.00	0.00
Elymus smithii	0.00	5.00	0.00	0.00	0.00	5.00	5.00
Hordeum jubatum	0.00	19.00	0.00	0.00	0.00	0.00	0.00
Poa pratensis	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sporobolus airoides	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Stipa hymenoides	0.00	0.00	0.00	0.00	0.00	0.00	0.00
COVER							
Total Living Cover	35.00	35.00	35.00	15.00	15.00	25.00	10.00
Litter	10.00	15.00	5.00	5.00	5.00	5.00	20.00
Bareground	40.00	15.00	20.00	50.00	55.00	45.00	50.00
Rock	15.00	35.00	40.00	30.00	25.00	25.00	20.00
% COMPOSITION							
Shrubs	0.00	17.14	0.00	33.33	0.00	0.00	0.00
Forbs	71.43	0.00	85.71	33.33	80.00	20.00	50.00
Grasses	28.57	82.86	14.29	33.33	20.00	80.00	50.00

8.00	9.00	10.00	11.00	12.00	13.00	14.00	15.00	Mean	SDev
5.00	0.00	5.00	0.00	0.00	0.00	0.00	0.00	1.00	2.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.25
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33	1.25
2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.27	0.68
0.00	5.00	0.00	0.00	0.00	0.00	5.00	0.00	1.20	2.04
0.00	5.00	0.00	0.00	0.00	0.00	0.00	10.00	1.33	2.87
1.00	0.00	0.00	5.00	5.00	0.00	0.00	5.00	4.80	7.33
3.00	0.00	5.00	0.00	0.00	5.00	5.00	0.00	1.93	2.21
0.00	0.00	0.00	0.00	0.00	5.00	0.00	0.00	0.33	1.25
2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.50
0.00	5.00	5.00	0.00	5.00	5.00	10.00	0.00	3.67	4.27
0.00	5.00	5.00	0.00	5.00	0.00	*5.00*	5.00	2.87	2.39
2.00	10.00	0.00	5.00	5.00	5.00	0.00	5.00	3.13	2.96
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.27	4.74
5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33	1.25
0.00	0.00	0.00	5.00	0.00	0.00	0.00	0.00	0.33	1.25
0.00	0.00	5.00	0.00	0.00	0.00	0.00	0.00	0.33	1.25
20.00	30.00	25.00	15.00	20.00	20.00	25.00	25.00	23.33	7.67
10.00	10.00	5.00	5.00	5.00	5.00	5.00	5.00	7.67	4.42
45.00	30.00	35.00	20.00	40.00	55.00	45.00	45.00	39.33	12.36
25.00	30.00	35.00	60.00	35.00	20.00	25.00	25.00	29.67	10.40
25.00	0.00	20.00	0.00	0.00	0.00	0.00	0.00	6.37	11.02
30.00	33.33	20.00	33.33	25.00	50.00	40.00	60.00	42.14	23.19
45.00	66.67	60.00	66.67	75.00	50.00	60.00	40.00	51.49	20.60

ENERGY WEST
Reclaimed Slope ' 98 (Final)
Cottonwood Fan Portal Area
Slope: Variable deg
Exposure: South West
Sample Date: 28 Aug - 1 Sept 00

Freq	
	SHRUBS
20.00	*Atriplex canescens*
6.67	*Artemisia tridentata*
6.67	*Chrysothamnus nauseosus*
	FORBS
13.33	*Achillea millefolium*
26.67	*Aster chilensis*
20.00	*Linum lewisii*
60.00	*Melilotus officinalis*
46.67	*Penstemon palmeri*
6.67	*Salsola pestifer*
	GRASSES
6.67	*Agropyron cristatum*
53.33	*Elymus cinereus*
60.00	*Elymus lanceolatus*
60.00	*Elymus smithii*
6.67	*Hordeum jubatum*
6.67	*Poa pratensis*
6.67	*Sporobolus airoides*
6.67	*Stipa hymenoides*
	COVER
	Total Living Cover
	Litter
	Bareground
	Rock
	% COMPOSITION
	Shrubs
	Forbs
	Grasses

COLOR
PHOTOGRAPHS

Cottonwood Canyon - Reclaimed Slopes

Cottonwood Canyon - Soil Piles (Subsoil)

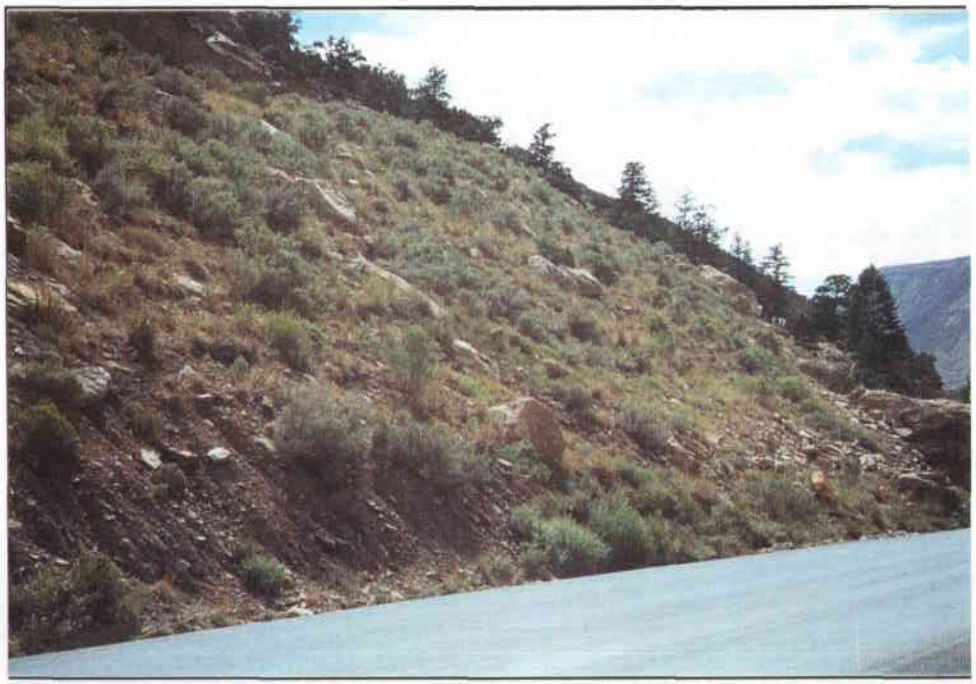
Cottonwood Canyon - Soil Piles (Topsoil)

Cottonwood Canyon - Reference Area

Cottonwood Canyon - CFP Conveyor Slope '96

Cottonwood Canyon - Belt Portal'96

Cottonwood Canyon - Portal Diesel '96



Cottonwood Canyon - Reclaimed Slope (Final) '98

RILDA CANYON AREA

ENERGY WEST MINING COMPANY
QUALITATIVE SAMPLING DATA SHEET AND
QUANTITATIVE/QUALITATIVE NOTES
2000

SITE NAME: Pad Area Slopes (96)

AREA: Rilda Canyon

DATE: September 1-4, 2000

WORKERS: P. Collins, D. Collins

SLOPE: 20-30 deg.

EXPOSURE: variable

ANIMAL USE/DISTURBANCE: Slight

EROSION: Minimal

COVER: (No quantitative data were recorded this year)

DOMINANT PLANT SPECIES OBSERVED:

Populus tremuloides
Rosa woodsii

Astragalus cicer
Melilotus officinalis
Medicago sativa

Bromus japonicas
Poa pratensis
*Elymus cinereus**
Elymus smithii
*Elymus lanceolatus**

NOTES: 1) Qualitative sampling only was done this year.

2) All slopes looked very good.

ENERGY WEST MINING COMPANY
QUALITATIVE SAMPLING DATA SHEET AND
QUANTITATIVE/QUALITATIVE NOTES
2000

SITE NAME: Roadway Slopes

AREA: Rilda Canyon

DATE: September 1-4, 2000

WORKERS: P. Collins, D. Collins

SLOPE: 10-20 deg.

EXPOSURE: E

ANIMAL USE/DISTURBANCE:

EROSION: Negligible

COVER: (No quantitative data were recorded this year)

DOMINANT PLANT SPECIES OBSERVED:

Gutierrezia sarothrae
Rosa woodsii
Populus tremuloides

Aster foliaceus
*Astragalus cicer**
Medicago sativa
Melilotus officinalis

*Elymus lanceolatus**
Elymus smithii
Elymus cinereus
Stipa hymenoides
Poa fendleriana

NOTES:
1) Qualitative sampling only was done this year.
2) All slopes appeared quite stable
4) Some of the slopes, but not all were sampled to remove erosion control structures (~).

ENERGY WEST MINING COMPANY
QUALITATIVE SAMPLING DATA SHEET AND
QUANTITATIVE/QUALITATIVE NOTES
2000

SITE NAME: Topsoil Pile (and some Roadway Slopes)

AREA: Rilda Canyon

DATE: September 1-4, 2000

WORKERS: P. Collins, D. Collins

SLOPE: 30 deg.

EXPOSURE: E

ANIMAL USE/DISTURBANCE: Slight, including elk.

EROSION: None observed

COVER: (Cover not sampled this year) Approx. 15%-20%

DOMINANT PLANT SPECIES OBSERVED:

Artemisia tridentata (S,P)
Gutierrezia sarothrae (S,P)
Rosa woodsii (S,P)

Melilotus officinalis (S,P)
Astragalus cicer (S,P)
Cynoglossum officinale (S,P)
Penstemon palmeri

Elymus lanceolatus (S,P)
Elymus smithii
Elymus cinereus
Stipa hymenoides (P)
Poa pratensis (S)

S= Present on slopes.
P= Present on soil pile.

1) Qualitative sampling only was done this year.

2) In 1997 it was reported that "from a distance it appeared the entire pile was growing nothing but yellow sweetclover, but on further examination there were lots of grasses under it."

In 1998, the grasses dominated the site. In 1999 grasses and yellow sweetclover dominated. In 2000, there was little sweetclover.

3) Some of the side slopes had much more cover than other slopes probably due to slope angles. They are expected to fill in.

4) There was very good slope stabilization occurring.

COLOR
PHOTOGRAPHS

Rilda Canyon - Pad Area Slopes '96

Rilda Canyon - Roadway Slopes '96

Rilda Canyon - Topsoil Pile '95