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VEGETATIVE MONITORING REPORT

UTAH POWER AND LIGHT COMPANY

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VEGETATIVE MONITORING REPORT
UTAH POWER AND LIGHT COMPANY

SCOPE:

Utah Power and Light Company maintains 5 coal related properties located in Emery County in Southeastern Utah [see Figure 1 - Location Map]. Fifteen areas have had interim reclamation and two properties have had final reclamation. This report deals with the success of the vegetation establishment on each of the properties. An attempt was made to establish parameters of evaluation and identify potential problems so that corrective measures can be implemented where necessary.

METHODOLOGIES:

Two types of surveys were conducted depending on the status of the reclamation in accordance with the monitoring schedule committed to in the respective MRP's. The two methods are: [1] Interim, and [2] Final Sampling. A description of each is as follows:

[1] Interim: Quantitative sampling of vegetation involved the establishment of a permanent 100' transect. A random numbers table was used to determine the number of paces between the edge of the property and the beginning of the transect. The direction of each transect was randomly selected by a hand-held compass. Only those compass headings which placed the entire 100' transect

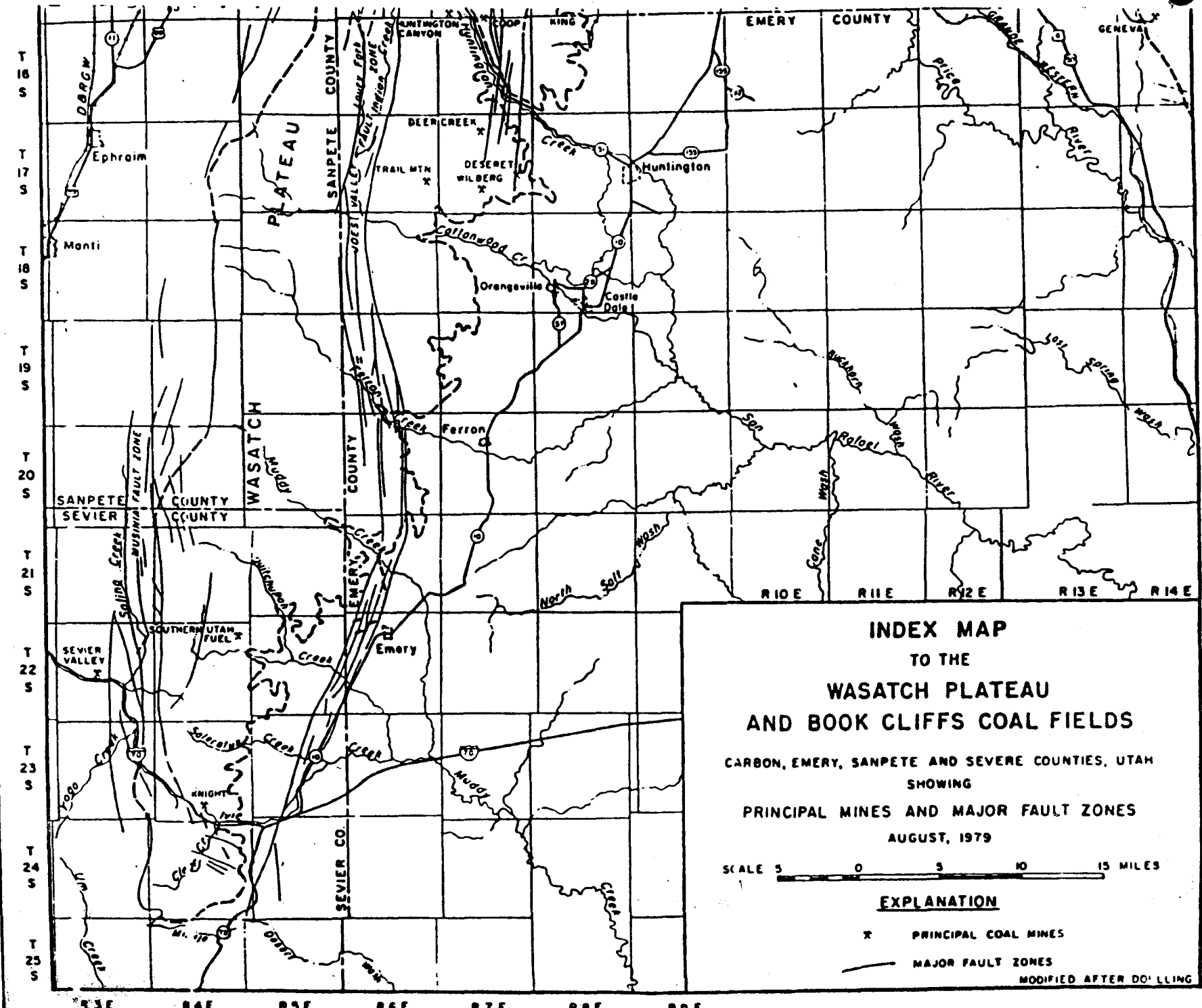
INDEX MAP
TO THE
WASATCH PLATEAU
AND BOOK CLIFFS COAL FIELDS
CARBON, EMERY, SANPETE AND SEVERE COUNTIES, UTAH
SHOWING
PRINCIPAL MINES AND MAJOR FAULT ZONES
AUGUST, 1979
SCALE 5 0 5 10 15 MILES
EXPLANATION
PRINCIPAL COAL MINES
MAJOR FAULT ZONES
MODIFIED AFTER DOELLING
EMERY COUNTY
SANPETE COUNTY
SEVIER COUNTY
WASATCH PLATEAU
Ephraim
Manti
Huntington
Orangeville
Castle Dale
Ferron
Emery
GENEVA
HUNTINGTON CANYON
COOP
KING
DEER CREEK
TRAIL MTN
DESERET
WILBERG
SOUTHERN UTAH FUEL
SEVIER VALLEY
KNIGHT
Cottonwood Cr
Muddy Creek
Ferron Creek
Huntington Creek
Price River
San Rafael River
North Salt Wash
Cane Wash
Buckhorn Wash
Lost Spring Wash
Saleratus Creek
Muddy Creek
Yogo Creek
Clear Cr
Ivie
Dasert Wash
Um Creek
Saling Creek
MUSINIA FAULT ZONE
JOES VALLEY FAULT ZONE
Lower Fork Indian Creek
Grande Western
T 16 S
T 17 S
T 18 S
T 19 S
T 20 S
T 21 S
T 22 S
T 23 S
T 24 S
T 25 S
R 3 E
R 4 E
R 5 E
R 6 E
R 7 E
R 8 E
R 9 E
R 10 E
R 11 E
R 12 E
R 13 E
R 14 E

FIGURE -1

within the property boundary were used. Fifty plots locating 10 point samples each were taken along the transect using a modified point frame. Recordings included plant species, litter, rock and bare ground. A species list, and cover by species were thus generated. A single tail t-test was used to determine the number of samples needed to satisfy a 90% confidence limit.

A qualitative assessment of rodent damage was conducted. Wildlife use was examined and plant species preferred for grazing were recorded. Any signs of erosion or man-induced influences were noted.

[2] Final: Quantitative sampling of final reclaimed areas and the associated reference sites involved three sampling methods. Species composition and cover were determined using the point sample method previously described for interim reclamation.

Woody plant density was established using the point center quarter sample method. Eight locations along the line transect were randomly chosen as the center for point-center-quarter sampling. The closest woody plant [shrub or tree] in each of the 4 cardinal directions were determined. Recordings included species, plant height and the distance from center point to plant.

The third sampling method was used to determine productivity. Five areas, 6.27" x 100" in size were randomly located within

the property. Plant growth established during the 1987 growing season was clipped and weighed. The plant material was then air dried in a temperature controlled oven at 105° C for 24 hours. A second weight was then recorded.

A students t-test of sample means was used to compare final reclamation with reference areas.

A qualitative assessment of rodent damage and other wildlife use was conducted. Site inspection included signs of erosion as well as any man-induced influences.

Each site is discussed in brief. The following information will preview the survey data:

1. Year reclamation was implemented.
2. Methodologies utilized.
3. Seed mix used.
4. Conclusions and recommendations.

1987 VEGETATION SURVEY

UTAH POWER AND LIGHT COMPANY

9th EAST ROAD - COTTONWOOD/WILBERG

9TH EAST ROAD - COTTONWOOD/WILBERG
INTERIM RECLAMATION SURVEY

General Background:

The 9th East Road property is located in Grimes Wash, a tributary to Cottonwood Creek. The property lies approximately 7 miles north of Orangeville, Utah [see Location Map - Figure 1]. The property encompasses 0.3 acres of reclaimed land. The 9th East Road property falls within the Federal Coal lease boundary. Elevation of the property is approximately 7725'.

Planting Methodologies:

The 9th East Road area was reclaimed in the fall of 1986. The following methodologies were implemented:

The seed mixture was broadcast at the predetermined rate using hurricane spreaders. The fertilizer mixture contained 50 pounds per acre ammonium nitrate and 75 pounds per acre triple superphosphate and was applied as a separate application. The slopes were raked to turn the soil surface and covered with a $\frac{1}{2}$" layer of chopped alfalfa hay [2 tons per acre] for mulch. Conwed netting was applied to retain seed and mulch on the 24% slope.

Conclusion and Recommendations:

The survey was completed September 28, 1987. The overall appearance

of the entire site is good. Plant vigor is good. The majority of the species appear to be well established. There is no evidence of adverse impacts from grazing, insects or rodents. No evidence of erosion is present. The straw bales remain in place and are functioning properly.

It appears at this time the only recommendation which the survey data indicate, is to continue to monitor the site for further vegetation establishment.

Survey results, species list, example of field notes are included as Attachment 1.

ATTACHMENT 1

SEED MIXTURE

9TH EAST ROAD

SCIENTIFIC NAME	COMMON NAME
Agropyron Smithii	Western Wheatgrass
Oryzopsis hymenoides	Indian ricegrass
Agropyron dasystachyum	Thickspike wheatgrass
Elymus cinereus	Great basin wildrye
Sitanion hystrix	Bottlebrush squirreltail
Elymus salinus	Salina wildrye
Hedysarum boreale	Utah Sweetvetch
Penstemon palmeri	Palmer penstemon
Medicago sativa	Ladak alfalfa
Melolotus officinalis	Yellow sweetclover
Aster chilensis	Pacific aster

SPECIES LIST

9th EAST ROAD

SYMBOL	SCIENTIFIC NAME	COMMON NAME
AVENA	Avena fatua	Wild oat
AGROP	Agropyron sp.	Wheatgrass
SIHYH	Sitanion hystrix	Squirreltail grass
ORHYH	Oryzopsis hymenoides	Indian ricegrass
BRMA	Bromus marginatus	Mountain brome
PEPA	Penstemon palmeri	Palmer penstemon
HEBO	Hedysarum boreale	Northern sweetvetch
ASCH[2]	Aster chilensis	Pacific aster
SAKA	Salsola kali	Russian Thistle
HAGL	Halogeton glomerata	Halogeton
BRASS[2]	Brassica sp.	Mustard
ERIOG	Eriogonum sp.	
CHVIL[4]	Chrysothamnus viscidiflorus	Little rabbitbrush

t-Test At 90% Confidence Level

n = 50 plots

$$n = \frac{[t]^2\ [s]^2}{[10\%\ \text{Mean}]^2}$$

t = 1 tail at 90% confidence is 1.299 with df = 49 [50-1]

Variance = standard deviation squared $[S]^2$ = 1.64 S= 1.282

1/10 Sample Mean $[\bar{x}]$ = 2.54 25.2

Sample Size [n] = 50 plots

Sample size needed for a 90% confidence =

1.687 × 1.64

$$n = \frac{[1.299]^2\ [1.64]}{\cancel{.065}\ (2.52)^2} = 42.6$$ should be at or below 50. $\frac{2.767}{6.45}$

6.35

$(2.54)^2$

(.10) 25.2

6.45

2.52

6.35

$$n = \frac{(1.299)^2\ (1.64)}{[(.10)(25.4)]^2} = \frac{1.687 \times 1.64}{(2.54)^2} = \frac{2.766}{6.45} = .42$$ sample needed.

VEGETATIVE COVER

9th EAST ROAD

Vegetative Cover		25.2%
Undesireables		3.8%
HAGL	.2%	
SAKA	3.6%	
Desireables		21.4%
AGSMS	2.6%	
ORHYH	.2%	
SIHY	.4%	
BRMO	4.4%	
AVFA	.2%	
ASCH[2]	12.6%	
HEBO	.4%	
ERIOG	.2%	
CHVI	.4%	

Litter	30.0%
Rock	2.8%
Bare Ground	42.0%
TOTAL	100.0%

Vegetation Field Notes

Company Name UP&L Date 9/28/87

Location ~~Ashtonwood~~/Wilburg Site 9th East Road Time 1135

Magnetic Heading _____ Transect # 1

Species vigor and/or % cover. 1 of 3

B	B	B	L	L	B	B	B	AGSMS	B
B	L	AGSMS	SAKA	B	HEBO	B	B	L	L
L	B	L	B	B	B	B	HEBO	B	L
L	L	L	AGSMS	B	R	AGSMS	ASCH^2	B	B
B	L	L	AGSMS	B	R	SAKA	B	B	B
B	ASCH^2	B	B	B	R	R	L	SAKA	ASCH^2
B	B	L	CHVI	B	B	SAKA	L	B	B
B	B	B	SAKA	B	L	B	AGSMS	L	B
R	B	B	AGSMS	L	B	B	B	B	B
L	L	L	L	B	B	B	B	B	L
B	B	L	ASCH^2	B	B	B	B	B	SAKA
L	L	L	L	B	B	L	L	B	L
L	AGSMS	L	B	B	L	B	B	ASCH^2	L
AGSMS	SAKA	L	B	B	SAKA	B	B	B	L
L	L	L	BRMA	B	L	L	ASCH^2	BRMA	SAKA
L	L	R	B	L	ASCH^2	BRMA	SAKA	ASCH^2	B
ASCH^2	ASCH^2	L	ASCH^2	L	B	B	ASCH^2	B	ASCH^2
L	L	L	ASCH^2	SIHYH	BRMA	L	SAKA	B	BRMA
L	L	B	R	L	B	B	B	B	B
L	BRMA	L	B	L	B	L	B	B	L

Comments & Observations Mustard [illegible] CHVI AGSMS ✓ SAKA ✓

Hero Northern Sweetwitch BRMA ✓ ASCH^2 ✓ HAGL ✓ [illegible]

ORHYH ✓ HEBO ✓ SIHY ✓

PEPA ✓

Heather Welker Barley wheat

Vegetation Field Notes

Company Name UP&L Date 9/28/87

Location Cottonwood/Wilberg Site 9th East Road. Time 1150

Magnetic Heading _____ Transect # 1

Species vigor and/or % cover.

2 of 3

B	B	L	SAKA	B	ASCH^2	ASCH^2	ASCH^2	AGSMS	B
L	L	L	L	ASCH^2	ASCH^2	B	B	ASCH^2	ORHYH
L	ASCH^2	R	ASCH^2	B	R	ASCH^2	ASCH^2	L	L
ASCH^2	L	R	ASCH^2	L	R	R	L	L	L
L	L	L	L	B	ASCH^2	ASCH^2	L	BRMA	B
L	L	L	AVEA	B	R	L	Hay Bale	L	B
B	B	ASCH^2	L	L	B	B	B	HAGL	ASCH^2
B	B	B	ASCH^2	ASCH^2	L	L	BRMA	L	SAKA
L	L	B	B	L	B	BRMA	B	L	B
ASCH^2	B	L	L	B	SAKA	ASCH^2	ASCH^2	B	L
L	L	L	B	B	L	B	L	AGSMS	B
L	ASCH^2	L	ASCH^2	L	B	B	L	B	ASCH^2
B	ASCH^2	ASCH^2	B	B	ASCH^2	L	B	L	B
CHUI	AGSMS	B	B	B	L	L	B	L	B
ASCH^2	B	B	B	B	SAKA	B	L	L	B
ASCH^2	B	L	B	L	BRMA	B	B	L	ASCH^2
L	L	ASCH^2	L	BRMA	B	B	B	B	L
L	ASCH^2	L	B	AGSMS	B	B	BRMA	B	B
B	B	L	ASCH^2	B	B	ASCH^2	ASCH^2	L	B
B	L	R	L	B	ASCH^2	ASCH^2	BRMA	L	BRMA

Comments & Observations

Difficult to I.D. Grass - Heads lost

Avena - near [illegible]

HAGL - [illegible]

Vegetation Field Notes

Company Name UP&L Date 9/28/87

Location Cottonwood/Wilberg Site 9th East Road Time 1215

Magnetic Heading _____ Transect # 1

Species vigor and/or % cover. 3 of 3

ASCH 2	L	B	BRMA	L	B	B	B	ASCH 2	L
ASCH 2	L	L	L	BRMA	B	B	B	BRMA	L
L	B	B	ASCH 2	B	B	B	B	L	L
B	BRMA	L	B	B	L	ERIOG	B	B	B
B	B	B	ASCH 2	ASCH 2	B	L	L	ASCH 2	B
L	L	L	B	L	B	ASCH 2	B	ASCH 2	BRMA
ASCH 2	B	L	L	SARA	B	B	SIHYH	BRMA	B
B	B	L	B	R	B	B	B	ASCH 2	ASCH 2
L	L	L	B	L	BRMA	ASCH 2	B	BRMA	L
SARA	L	SARA	L	L	L	B	B	B	B

Comments & Observations No evidence of grazing by livestock big game as [illegible]. No evidence of erosion. Hay bales still in good shape.

1987 VEGETATIVE SURVEY

UTAH POWER AND LIGHT COMPANY

BEEHIVE SUBSTATION

DES-BE-DOVE

BEEHIVE SUBSTATION/DES-BEE-DOVE

INTERIM RECLAMATION SURVEY

General Background:

The Beehive Substation property is located in a dry wash, a tributary to Grime's Wash. The property lies approximately 6 miles north of Orangeville, Utah [see Location Map - Figure 1]. The property encompasses 0.1 acres of reclaimed land. The Beehive substation area falls within the boundaries of federal leased property. Elevation of the survey site is 7975'.

Planting Methodologies:

The Beehive substation property was reclaimed in the Spring of 1986. The following methodologies were implemented:

The seed mixture was broadcast at the predetermined rate using hurricane spreaders. The seed mixture contained 50 pounds per acre ammonium nitrate and 75 pounds per acre triple superphosphate. The slopes were then raked to turn the soil surface and covered with a $\frac{1}{2}$" layer of chopped alfalfa hay [2 tons per acre] for mulch. Conwed netting was applied to retain seed and mulch on the slope.

Conclusions and Recommendations:

The survey was completed October 5, 1987. The overall appearance of

the entire site is good. Plant vigor is good. Although the majority of the vegetative cover consists of undesirables, there is a large percentage of desirable plant species, the majority of which appear to be well established. There is no evidence of adverse impacts from grazing, insects or rodents. No evidence of erosion is present.

The only recommendation which the survey data indicates at this time is to continue to monitor the site for further vegetation establishment.

Survey results, species list, example of field notes are included as Attachment 2.

ATTACHMENT 2

SEED MIXTURE

BEEHIVE SUBSTATION

SCIENTIFIC NAME	COMMON NAME
Agropyron Smithii	Western Wheatgrass
Oryzopsis hymenoides	Indian ricegrass
Agropyron dasystachyum	Thichspike wheatgrass
Elymus cinereus	Great basin wildrye
Sitanion hystrix	Bottlebrush squirreltail
Elymus salinus	Salina wildrye
Hedysarum boreale	Utah Sweetvetch
Penstemon palmeri	Palmer penstemon
Medicago sativa	Ladak alfalfa
Melolotus officinalis	Yellow sweetclover
Aster chilensis	Pacific aster

SPECIES LIST

BEEHIVE SUBSTATION

SYMBOL	SCIENTIFIC NAME	COMMON NAME
AGSMS	Agropyron smithii	Western wheatgrass
AGROP	Agropyron sp.	Wheatgrass
SIHY	Sitanion hystrix	Squirreltail grass
SAKA	Salsola kali	Russian thistle
HAGI	Halogeton glomerata	Halogeton
MEOF	Melilotus officinalis	Yellow sweetclover
CIAR	Cirsium arvense	Canada thistle
PEPA	Penstemon palmeri	Palmer penstemon
CHNA	Chrysothamnus nauseosus	Rubber rabbitbrush
ATCO	Atriplex confertifolia	Shadscale

t-Test at 90% Confidence

$$n = \frac{[t]^2\ [s]^2}{[10\%\ \text{mean}]^2}$$

t = 1 tail at 90% confidence is 1.299 with df = 49 [50-1]

Variance = Standard deviation squared [s^2] = 6.36

Sample mean [$\bar{x}$] = 5.7

Sample size [n] = 50

Sample size needed for 90% confidence

$$n = \frac{[1.299]^2\ [6.36]}{.33} = 32.5$$

$1.68 \times 6.36 = 10.73$

should be at or below 50 $\frac{10.73}{27.04} = .397$

$(5.2 \times .10)^2 = (5.2)^2 = 27.04$

VEGETATIVE COVER

BEEHIVE SUBSTATION

Vegetative Cover		52.0%
Undesirables		27.2%
SAKA	26.8%	
HAGL	0.4%	
Desirables		24.8%
AGSMS	11.6%	
AGROP	8.4%	
SIHY	1.0%	
MEOF	0.2%	
PEPA	0.4%	
CHNA	2.8%	
ATCO	0.4%	
Litter		8.4%
Rock		6.6%
Bare Ground		33.0%
TOTAL		100.0%

Vegetation Field Notes

Company Name UP&L Date 10/5/87

Location DeerBee-Dove Site Beehive Substation Time 930

Magnetic Heading 285°NW Transect # 1

Species vigor and/or % cover. 1 of 3

B	SAKA	B	SAKA	R	R	B	B	SAKA	SAKA
L	SAKA	SAKA	SAKA	R	R	AGSMS	SAKA	AGSMS	R
B	AGSMS	SAKA	SAKA	R	L	R	R	AGSMS	R
L	L	AGSMS	AGSMS	R	AGSMS	SAKA	L	SAKA	B
B	SAKA	SAKA	AGSMS	[illegible]	L	SAKA	SAKA	AGSMS	AGSMS
B	B	SAKA	AGSMS	L	SAKA	AGROP	SAKA	AGROP	L
L	SAKA	L	SAKA	SAKA	AGSMS	SAKA	R	SAKA	SAKA
SAKA	SAKA	SAKA	[illegible]	[illegible]	CHNA	SAKA	SAKA	SAKA	SAKA
SAKA	L	SAKA	AGROP	SAKA	SAKA	SAKA	SAKA	SAKA	SAKA
SAKA	SAKA	AGROP	AGROP	SAKA	SAKA	SAKA	B	SAKA	B
SAKA	HAGL	SAKA	SAKA	AGROP	R	HAGL	AGROP	SAKA	B
SAKA	SAKA	SAKA	CHNA	SAKA	SAKA	AGROP	CHNA	B	SAKA
L	R	SAKA	SAKA	SAKA	AGROP	L	L	SAKA	AGROP
SAKA	SAKA	SAKA	SAKA	SAKA	B	R	L	AGROP	SAKA
AGROP	SAKA	SAKA	SAKA	SAKA	SAKA	SAKA	SAKA	SAKA	AGROP
AGROP	L	L	SAKA	[illegible]	R	L	SAKA	SAKA	MEOF
→ R	R	SAKA	B	B	B	SAKA	SAKA	SAKA	SAKA
B	R	R	[illegible]	B	SAKA	[illegible]	[illegible]	AGROP	B
SAKA	SAKA	SAKA	[illegible]	SAKA	L	SAKA	B	R	R
AGROP	SAKA	SAKA	[illegible]	[illegible]	AGROP	L	CHNA	L	AGROP

Comments & Observations [illegible] not present

Much of the AGROP is dead.

SAKA CIAR
CHNA PSPA
AGSMS HAGL
[illegible] MEOF

Heather Welker

Vegetation Field Notes

Company Name UP&L **Date** 10/5/97

Location Des-Bee-Dove **Site** Kearns Substation **Time** 0930

Magnetic Heading _____ **Transect #** 1

Species vigor and/or % cover. 2 of 2

SAKA	SAKA	SAKA	SAKA	SAKA	SAKA	SAKA	SAKA	AGROP	SAKA
AGSMS	SAKA	SAKA	SAKA	B	B	B	SAKA	AGROP	AGSMS
AGSMS	SAKA	AGSMS	SAKA	SAKA	SAKA	SAKA	SAKA	SAKA	SAKA
SAKA	PSPA	R	AGSMS	SAKA	AGROP	AGROP	AGROP	SAKA	SAKA
AGROP	AGROP	SAKA	AGROP	AGROP	AGROP	SAKA	SAKA	AGROP	AGROP
B	B	B	SAKA	B	SAKA	AGROP	AGROP	AGROP	B
B	L	AGROP	L	AGROP	SAKA	B	B	AGROP	L
B	B	B	B	B	B	B	B	B	B
B	B	B	B	B	B	B	B	B	B
B	B	B	B	B	B	B	B	B	AGROP
SAKA	SAKA	SAKA	AGROP	AGROP	B	AGROP	B	B	B
AGROP	L	SAKA	SAKA	SAKA	B	L	ATCO	AGROP	R
L	AGSMS	AGSMS	AGSMS	AGSMS	AGSMS	L	AGSMS	L	R
AGSMS	B	B	B	AGSMS	B	B	B	B	B
AGSMS	B	AGSMS	B	B	B	AGSMS	CHNA	B	B
ATCO	AGSMS	B	B	B	B	B	B	B	B
L	R	R	L	B	B	AGROP	L	B	L
AGROP	AGROP	R	AGROP	SAKA	CHNA	CHNA	CHNA	AGROP	AGROP
L	B	B	SAKA	L	L	B	B	PEPA	B
L	B	B	B	L	B	AGROP	B	L	AGROP

Comments & Observations _____

more bare

W S E

Vegetation Field Notes

Company Name [illegible] Date 10/5/87

Location Des Bee Dove Site [illegible] Substation Time 930

Magnetic Heading _____ Transect # 1

Species vigor and/or % cover. 2 of 2

SARA	SIHY	AGROP	SIHY	E	SARA	CHNA	E	E	AGSMS
B	AGROP	B	ATCO	E	B	B	L	L	CHNA
AGSMS	L	L	AGSMS	AGSMS	B	R	CHNA	B	B
CHNA	AGSMS	AGSMS	AGSMS	E	B	R	R	AGROP	R
AGSMS	CHNA	CHNA	AGSMS	AGSMS	B	B	R	B	AGSMS
B	B	B	B	B	AGSMS	AGSMS	B	B	CHNA
AGSMS	AGSMS	R	B	B	B	B	B	B	B
AGSMS	B	B	B	E	AGSMS	B	B	B	B
AGSMS	AGSMS	AGSMS	B	AGSMS	B	AGSMS	L	AGSMS	B
AGSMS	AGSMS	B	AGSMS	AGSMS	L	R	R	AGSMS	AGSMS

Comments & Observations _____

1987 VEGETATION SURVEY

UTAH POWER AND LIGHT COMPANY

DEER CREEK MINE

DEER CREEK CANYON

DEER CANYON

INTERIM RECLAMATION SURVEY

General Background:

Deer Canyon is located up the Deer Creek drainage approximately 7 miles above the town of Huntington, Utah (see Location Map - Figure 1]. The property encompasses 0.1 acres of reclaimed land. The reclaimed area is located on Federal leased property. Elevation of the property ranges from 7500' to an elevation of 7515'.

Planting Methodologies:

The Deer Canyon area was reclaimed in the spring of 1986. The following methodologies were implemented:

The seed mixture was broadcast at the predetermined rate using hurricane spreaders. The fertilizer mixture contained 50 pounds per acre ammonium nitrate and 75 pounds per acre triple superphosphate and was applied as a separate application. After raking the slopes to turn the soil surface, a $\frac{1}{2}$" layer of chopped alfalfa hay (2 tons per acre was applied for mulch.

Conclusions and Recommendations:

The survey was completed October 11, 1987. The overall appearance of the entire site is good. Plant vigor is good. The majority of

species appear to be well established and have not been adversely impacted by grazing, insects or rodents. Some grazing was evident on young rabbit brush shrubs and penstemon but is not significant.

It appears at this time the only recommendation which the survey data indicates, is to continue to monitor the site for further vegetation establishment and grazing pressure.

Survey results, species list, example of field notes are included as Attachment 3.

ATTACHMENT 3

SEED MIXTURE

DEER CANYON

SCIENTIFIC NAME	COMMON NAME
Agropyron Smithii	Western Wheatgrass
Oryzopsis hymenoides	Indian ricegrass
Agropyron dasystachyum	Thichspike wheatgrass
Elymus cinereus	Great basin wildrye
Sitanion hystrix	Bottlebrush squirreltail
Elymus salinus	Salina wildrye
Hedysarum boreale	Utah Sweetvetch
Penstemon palmeri	Palmer penstemon
Medicago sativa	Ladak alfalfa
Melolotus officinalis	Yellow sweetclover
Aster chilensis	Pacific aster

SPECIES LIST

DEER CREEK/DEER CANYON

SYMBOL	SCIENTIFIC NAME	COMMON NAME
AGROP	Agropyron sp.	Wheatgrass
ORHYH	Oryzopsis hymenoides	Indian ricegrass
PEPA	Penstemon palmeri	Palmer penstemon
HAGL	Halogeton glomerata	Halogeton
VETH	Verbascum thapsus	Mulesear dock
SAKA	Salsola kali	Russian thistle
MEOF	Melilotus officinalis	Yellow sweetclover
GRSQ	Grindelia squarrosa	curlycup gumweed
MAAF	Malcolmia africana	African mustard
CHNA	Chrysothamnus nauseosus	Rubber rabbit brush

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t-Test at 90% Confidence

$$n = \frac{[t]^2\ [s]^2}{[10\%\ \text{mean}]^2}$$

t = 1 tail at 90% confidence is 1.299 with df = 49 [50-1]

Variance = standard deviation squared $[s^2]$ = 3.35

Sample mean $[\bar{x}]$ = 1.8

Sample size [n] =

Sample size needed for a 90% confidence

$$n = \frac{[1.299]^2\ [3.35]}{.03} = 188.4$$ should be at or below 50 *

* The Deer Canyon property shows a large amount of variability in vegetative cover. The maximum number of samples required by DOGM [50] is still insufficient in accounting for all variability.

VEGETATIVE COVER

DEER CREEK/DEER CANYON

Vegetative Cover		22.4%
Undesirables		8.4%
	MAAF	2.2%
	SAKA	6.0%
	HAGL	0.2%
Desirables		14.0%
	AGROP	10.0%
	MEOF	2.0%
	CHNA	1.8%
	PEPA	0.2%
Litter		0.8%
Rock		0.4%
Bare Ground		76.4%
TOTAL		100.0%

Vegetation Field Notes

Company Name UP&L **Date** 10/11/87

Location Huntington Drainage **Site** Deer Creek Deer Canyon **Time**

Magnetic Heading **Transect #** 1

Species vigor and/or % cover. 1 of 3

B		B		~~MAAF~~		B		CHNA		B		AGROP		B		AGROP		B	
AGROP		B		L		B		B		B		B		B		AGROP		B	
B		B		B		AGROP		~~MAAF~~		~~MAAF~~		B		CHNA		~~MAAF~~		B	
B		B		B		~~MAAF~~		B		B		B		B		AGROP		AGROP	
B		MEOF		B		MEOF		B		B		B		B		B		AGROP	
B		B		B		B		B		AGROP		B		B		B		B	
CHNA		B		B		AGROP		B		B		B		B		B		B	
B		B		B		B		R		AGROP		B		B		B		B	
B		B		B		B		B		B		B		B		B		B	
B		B		B		MEOF		B		B		B		B		B		B	
B		B		B		B		B		B		B		B		B		B	
CHNA		B		B		AGROP		B		SAKA		SAKA		SAKA		B		B	
MEOF		AGROP		B		SAKA		MEOF		B		B		B		L		CHNA	
B		B		B		B		B		B		B		B		B		B	
B		AGROP		B		B		B		B		B		B		B		B	
MEOF		B		B		AGROP		B		AGROP		B		B		CHNA		B	
B		B		B		B		B		B		B		B		AGROP		B	
B		AGROP		AGROP		B		B		AGROP		B		B		B		B	
B		B		SAKA		B		B		B		B		B		B		B	
B		B		B		B		CHNA		B		B		B		B		B	

Comments & Observations [illegible] Young CHNA Sprouts [illegible]
[illegible] Gumweed - Dairy
[illegible] CHNA VET MEOF HAGL ORHY

Vegetation Field Notes

Company Name UPEI **Date** 10/11/87

Location Huntington Drainage **Site** Deer Crk Deer Canyon **Time**

Magnetic Heading **Transect #** 1

Species vigor and/or % cover. 2 of 3

B	B	B	B	B	B	B	~~MAAF~~	B	B
B	B	B	B	B	B	B	B	B	B
B	B	B	AGROP	AGROP	B	B	B	B	B
B	B	B	B	B	SAKA	B	B	B	B
B	B	B	B	AGROP	B	B	B	~~MAAF~~	B
B	B	B	B	B	B	B	B	B	B
B	B	B	B	B	B	B	B	B	B
B	B	AGROP	B	B	B	B	MEOF	AGROP	B
B	B	B	B	B	B	B	B	B	B
AGROP	B	B	B	AGROP	Purse	AGROP	B	B	B
B	AGROP	B	AGROP	B	B	SAKA	B	AGROP	B
B	B	B	MEOF	B	PEPA	B	B	CHNA	AGROP
B	B	B	B	B	B	Bromo	CHNA	B	B
AGROP	AGROP	AGROP	B	R	~~MAAF~~	~~MAAF~~	~~MAAF~~	~~MAAF~~	B
AGROP	AGROP	B	AGROP	~~L~~	B	B	B	AGROP	B
B	B	B	AGROP	B	B	PEPA	CHNA	B	AGROP
B	B	B	B	B	B	SAKA	B	B	AGROP
B	B	B	MEOF	MEOF	B	B	B	B	B
B	B	B	B	B	MEOF	B	B	B	B
AGROP	HAGL	B	B	B	CHNA	AGROP	B	B	B

Comments & Observations [illegible]

PEPA grazed

Cow Scat Present

Vegetation Field Notes

Company Name UKEL Date 10/11/87

Location Huntington Drainage Site [illegible] Time

Magnetic Heading Transect # 1

Species vigor and/or % cover. 3 of 3

B		B		L		B		B		B		B		B		AGROP		B	
B		B		B		AGROP		AGROP		B		B		B		B		B	
B		B		B		B		B		B		SAKA		SAKA		AGROP		B	
B		B		B		AGROP		SAKA		SAKA		SAKA		SAKA		SAKA		SAKA	
B		B		B		AGROP		SAKA		SAKA		SAKA		B		SAKA		B	
B		SAKA		SAKA		B		B		B		SAKA		SAKA		B		B	
B		SAKA		B		SAKA		SAKA		B		B		B		B		B	
B		B		SAKA		MEOF		B		B		B		B		B		B	
B		B		B		B		B		B		B		B		B		B	
~~AAAF~~		B		B		B		B		B		SAKA		B		B		SAKA	

Comments & Observations [illegible]

1987 VEGETATION SURVEY

UTAH AND POWER LIGHT COMPANY

HAUL ROAD BENCH

DES-BEE-DOVE

HAUL ROAD - DES-BEE-DOVE
INTERIM RECLAMATION

General Background:

The Haul Road Bench property is located in a dry wash, a tributary of Grime's Wash. The property lies approximately 6 miles north of Orangeville, Utah [see Location Map - Figure 1]. The property encompasses 2.0 acres of reclaimed land. The Haul Road Bench area is located on state leased property. Elevation of the property is approximately 6950'.

Planting Methodologies:

The Haul Road Bench was reclaimed in the fall of 1986. The following methodologies were implemented:

The predetermined rate of seed mixture was broadcast using hurricane spreaders. The fertilizer mixture contained 50 pounds per acre ammonium nitrate and 75 pounds per acre triple superphosphate and was applied separately. The area was then raked to turn the soil surface and covered with a $\frac{1}{2}$" layer of chopped alfalfa hay [2 tons per acre] for mulch.

Conclusions and Recommendations:

The survey was completed on October 5, 1987. The overall appearance of the entire site was poor with undesirable species making up the

majority of the vegetation. Little vegetation was established and is speculated to be the result of poor soil conditions. There is no evidence of wildlife use on the Haul Road Bench. A single gully approximately 4" in depth is located in the south central portion of the property. No other sign of erosion problems was present.

Based on the survey results, the only recommendation indicated by the data is to continue monitoring for evidence of erosion and implement corrective measures of problem areas appear.

Survey results, species list, example of field notes are included as Attachment 4.

ATTACHMENT 4

SEED MIXTURE

HAUL ROAD BENCH - DES-BEE-DOVE

SCIENTIFIC NAME	COMMON NAME
Elymus salinus	Salina wild rye
Oryzopsis hymenoides	Indian ricegrass
Sitanion hystrix	Squirreltail grass
Elymus cinereus	Great basin wild rye
Eriogonum corymbosum	Coryumbed eriogonum
Melilotus officinalis	Yellow sweetclover
Atriplex cuneata	Cuneate salt brush
Atriplex confertifolia	Shadscale
Penstemon eatonii	Eaton penstemon
Atriplex canescens	4-wing salt brush

SPECIES LIST

HAUL ROAD BENCH

SYMBOL	SCIENTIFIC NAME	COMMON NAME
AGROP	Agropyron sp.	Wheatgrass
HAGL	Halogeton glomerata	Halogeton
SAKA	Salsola kali	Russian thistle
ATCOR	Atriplex corrugata	Mat saltbush
ATCO	Atriplex confertifolia	Shadscale

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t-Test at 90% Confidence Level

n = 50 plots

$$n = \frac{[t]^2\ [s]^2}{[10\%\ \text{mean}]^2}$$

t = 1 tail at 90% confidence is 1.299 with df = 49 [50-1]

Variance = standard deviation squared $[s^2]$ = 4.15

Sample mean $[\bar{x}]$ = 2.18

Sample size [n] = 50

Sample size needed for a 90% confidence

$$n = \frac{[1.299]^2\ [4.15]}{.048} = 145.9$$ should be at or below 50 *

*The Haul Road Bench property shows a large amount of variability in vegetative cover. The maximun number of samples required by DOGM [50] is still insufficient in accounting for all variability.

VEGETATIVE COVER

HAUL ROAD BENCH

Vegetative Cover		22.2%
Undesirables		20.4%
SAKA	3.0%	
HAGL	17.4%	
Desirables		1.8%
AGROP	0.2%	
ATCO	0.2%	
ATCOR	1.4%	
Litter		0%
Rock		0.2%
Bare Ground		77.6%
TOTAL		100.0%

Vegetation Field Notes

Company Name UPEL Date 10/5/87

Location ~~[illegible]~~ DBD Site Haul Road Time 1300

Magnetic Heading 310° NW Transect #

Species vigor and/or % cover. 15 of 3

B	HAGL	HAGL	B	B	B	B	HAGL	B	B
B	HAGL	HAGL	B	B	B	B	B	B	B
B	HAGL	HAGL	HAGL	HAGL	HAGL	HAGL	HAGL	B	B
HAGL	B	B	B	HAGL	B	HAGL	B	B	B
HAGL	HAGL	HAGL	HAGL	HAGL	B	B	B	B	HAGL
B	HAGL	HAGL	HAGL	HAGL	B	HAGL	HAGL	HAGL	HAGL
HAGL	HAGL	B	HAGL	HAGL	B	B	HAGL	HAGL	HAGL
HAGL	B	B	B	B	B	HAGL	HAGL	HAGL	B
B	B	B	B	B	HAGL	HAGL	B	B	B
B	B	B	B	B	B	B	HAGL	B	B
B	ATCOR	HAGL	B	B	B	B	B	B	B
B	HAGL	ATCOR	B	B	B	B	B	B	B
B	B	B	B	HAGL	B	B	B	HAGL	B
B	B	B	ATCOR	HAGL	B	B	B	B	B
HAGL	B	B	B	B	HAGL	B	B	B	HAGL
SAKA	HAGL	B	HAGL	HAGL	B	HAGL	HAGL	B	HAGL
B	B	B	B	B	B	HAGL	B	HAGL	B
HAGL	B	B	B	B	B	ATCOR	B	HAGL	B
B	B	B	B	B	B	B	B	B	B
B	B	B	HAGL	HAGL	B	B	HAGL	B	B

Comments & Observations ATCO [illegible] ATCOR

Heather Weeker

Vegetation Field Notes

Company Name UP&L **Date** 10/5/87

Location ~~Glenwood/Willow~~ DBD **Site** Haul Road **Time** 1325

Magnetic Heading 310° NW **Transect #**

Species vigor and/or % cover. 2 of 3

B	B	B	B	B	B	B	B	B	B
B	B	B	HAGL	B	B	HAGL	B	HAGL	SAKA
B	B	B	B	B	B	B	B	B	B
B	B	B	B	B	B	B	B	B	B
B	B	B	HAGL	B	B	B	B	B	B
HAGL	B	B	B	B	B	B	SAKA	B	HAGL
B	B	B	B	B	B	HAGL	B	B	B
B	B	B	B	B	B	B	B	B	B
B	SAKA	B	B	B	B	B	B	B	B
B	B	B	B	B	B	B	B	B	B
B	B	B	SAKA	SAKA	B	B	B	B	B
B	HAGL	B	B	B	B	B	B	B	B
B	B	B	ATCO	B	B	B	B	B	B
B	HAGL	B	HAGL	B	B	HAGL	B	B	B
HAGL	B	B	B	B	B	B	B	B	B
B	B	B	B	B	HAGL	B	B	B	B
ATCO	B	B	B	B	B	HAGL	SAKA	B	SAKA
B	B	B	B	B	B	SAKA	B	SAKA	B
B	B	B	B	ATCO	B	B	B	B	B
B	B	B	B	B	B	B	B	B	B

Comments & Observations Gullies started through center ≤ 4" in depth

Vegetation Field Notes

Company Name WP&L **Date** 10/5/87

Location ~~Cottonwood/Walker~~ DBD **Site** Lund Road **Time** 1325

Magnetic Heading 310° NW **Transect #** 1

Species vigor and/or % cover. 3 of 3

B	B	B	B	B	B	B	B	B	B
B	SAKA	B	HAGL	SAKA	B	B	B	B	HAGL
B	B	B	B	B	SAKA	B	B	HAGL	I
SAKA	B	B	E	E	B	B	B	B	B
B	B	B	B	E	B	B	B	B	HAGL
B	B	B	B	E	B	B	B	B	B
B	B	B	E	E	B	B	B	B	B
B	SAKA	B	B	B	HAGL	HAGL	B	B	B
B	B	B	B	HAGL	B	B	B	HAGL	B
B	B	B	E	E	AGROP	B	HAGL	B	B

Comments & Observations AGPA

1987 VEGETATION SURVEY

UTAH POWER AND LIGHT COMPANY

MATERIAL YARD SLOPE

DES-BEE-DOVE

MATERIAL YARD SLOPE
INTERIM RECLAMATION SURVEY

General Background:

The Material Yard Slope property is located in an upper portion of a dry wash which is a tributary to Grime's Wash. The property lies approximately 6 miles north of Orangeville, Utah [see Location Map - Figure 1]. The property encompasses 1.1 acres of reclaimed land. The Material Yard Slope is located on federally leased land. The elevation of the property ranges from 7450' to 7575'.

Planting Methodologies:

The Material Yard Slope was reclaimed in the fall of 1984. The following methodologies were implemented:

The seed mixture was broadcast at the predetermined rate using hurricane spreaders. The fertilizer mixture contained 50 pounds per acre ammonium nitrate and 75 pounds per acre triple superphosphate and was applied separately. The slopes were then raked to turn the soil surface and covered with a $\frac{1}{2}$" layer of chopped alfalfa hay [2 tons per acre] for mulch. Conwed netting was then applied to retain seed and mulch on the 50% slope.

Conclusions and Recommendations:

The survey was completed October 5, 1987. The overall appearance of the entire site is excellent with a majority of the vegetative cover consisting of desirable species. Plant vigor is good with the majority of the species well established. There is no evidence of adverse impacts from grazing, insects or rodents. Several rills, 3 to 6 inches in depth have developed along the west and southwest portions of the property.

It appears at this time the only recommendations which the survey data indicate are to continue monitoring the site for further vegetation establishment and continued evidence of erosion. Corrective measures for problem area may need to be implemented in the future.

Survey results, species list, example of field notes are included as Attachment 5.

SEED MIXTURE

MATERIAL YARD SLOPE

SCIENTIFIC NAME	COMMON NAME
Agropyron Smithii	Western Wheatgrass
Oryzopsis hymenoides	Indian ricegrass
Agropyron dasystachyum	Thichspike wheatgrass
Elymus cinereus	Great basin wildrye
Sitanion hystrix	Bottlebrush squirreltail
Elymus salinus	Salina wildrye
Hedysarum boreale	Utah Sweetvetch
Penstemon palmeri	Palmer penstemon
Medicago sativa	Ladak alfalfa
Melolotus officinalis	Yellow sweetclover
Aster chilensis	Pacific aster

SPECIES LIST

MATERIAL YARD SLOPE

SYMBOL	SCIENTIFIC NAME	COMMON NAME
AGROP	Agropyron sp.	Wheatgrass
ORHY	Oryzopsis hymenoides	Indian ricegrass
AGSMS	Agropyron smithii	Western wheatgrass
SIHY	Sitanion hystrix	Squirreltail grass
ELCI[2]	Elymus cinerius	Great basin wildrye
HAGL	Halogeton glomerata	Halogeton
PEPA	Penstemon palmeri	Palmer penstemon
MEOF	Melilotus officinalis	Yellow sweetclover
ASCH	Aster chilensis	Pacific aster
ATCO	Atriplex confertifolia	Shadscale
ATCA[2]	Atriplex canescens	4-wing saltbush
CHNA	Chrysothamnus nauseosis	Rubber rabbit brush
ATCOR	Atriplex corrugata	Mat saltbush

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t-Test at 90% Confidence Level

$$n = \frac{[t]^2\ [s]^2}{[10\%\ \text{mean}]^2}$$

t = 1 tail at 90% confidence is 1.299 with df = 49 [50-1]

Variance = standard deviation squared [s^2] = 2.49

Sample mean [$\bar{x}$] = 5.14

Sample size [n] = 50

Sample size needed for 90% confidence =

$$n = \frac{[1.299]^2\ [2.49]}{.264} = 15.9$$

should be at or below 50

VEGETATIVE COVER

MATERIAL YARD SLOPE

Vegetative Cover		49.8%
Undesirables		2.6%
HAGL	2.6%	
Desirables		47.2%
ORHYH	9.6%	
AGSMS	32.8%	
AGROP	3.2%	
ELCI	0.2%	
SIHY	0.4%	
MEOF	0.4%	
ATCOR	0.2%	
PEPA	0.2%	
CHNA	0.2%	
Litter		0.2%
Rock		0.2%
Bare Ground		49.8%
TOTAL		100.0%

Vegetation Field Notes

Company Name UP&L **Date** 10/5/87

Location ~~Automated Drilling~~ DBD **Site** Natural Spud Slope **Time** 1300

Magnetic Heading 160° SE **Transect #** 1

Species vigor and/or % cover. 1 of 3

B	B	B	B	AGSMS	B	B	B	AGSMS	AGSMS
B	B	AGSMS	AGSVE	B	B	B	AGROP	B	B
ORHY	B	B	B	B	AGSMS	AGSMS	AGSMS	AGSMS	AGSMS
AGSMS	B	B	B	AGSMS	B	B	AGSMS	AGSMS	B
B	AGSMS	B	AGSMS	B	B	AGSMS	AGSMS	B	B
B	AGSMS	B	B	B	B	B	B	B	B
AGSMS	B	B	B	B	AGSMS	B	B	AGSMS	B
B	B	AGSMS	B	B	AGSMS	B	AGSMS	AGSMS	AGSMS
ATCO	AGSMS	B	B	B	B	ORHY	B	AGSMS	B
B	AGSMS	B	ORHY	B	AGSMS	B	AGSMS	B	B
AGSMS	AGSMS	B	ORHY	B	AGSMS	B	B	AGSMS	AGSMS
B	AGSMS	B	AGSMS	AGSMS	B	AGSMS	B	ORHY	B
ORHY	ORHY	ORHY	ORHY	B	AGSMS	B	ORHY	B	ORHY
B	B	AGSMS	AGSMS	B	AGSMS	ORHY	ORHY	B	B
HAGL	ORHY	AGSMS	AGSMS	B	B	B	ORHY	B	B
B	AGSMS	AGSMS	AGSMS	AGSMS	AGSMS	AGSMS	ORHY	AGSMS	AGSMS
AGSMS	AGSMS	AGSMS	AGSMS	B	B	AGSMS	AGSMS	ORHY	B
B	B	B	B	AGSMS	AGSM	AGSMS	AGSMS	AGSMS	AGSMS
AGSMS	ORHY	AGSM	B	B	AGSM	MEST	B	B	B
B	ASCH	AGSM	B	B	B	AGSMS	AGSMS	B	B

Comments & Observations AGSMS MEST
ORHY ASCH
ATCO PSPI

Heather Walker

Vegetation Field Notes

Company Name LPSL **Date** 10/5/87

Location ~~Colorado/Williams~~ DBD **Site** Material Yard Slope **Time** 1200

Magnetic Heading _____ **Transect #** 1

Species vigor and/or % cover. 2 of 3

B	AGSMS	AGSMS	AGSMS	B	ORHY*	ORHY*	ORHY*	B	B
AGSMS	ORHY*	AGSMS	ORHY*	B	B	B	B	AGSMS	ORHY*
AGSMS	AGSMS	AGSMS	AGSMS	B	B	B	SIHY	AGSMS	AGSMS
AGSMS	AGSMS	AGSMS	AGSMS	AGSMS	AGSMS	B	AGSMS	ORHY*	B
AGSMS	AGSMS	B	AGSMS	B	B	SIHY	B	B	B
B	B	B	PEPA	AGSMS	B	AGSMS	AGSMS	AGSMS	B
AGSMS	AGSMS	AGSMS	B	B	PEPA	AGSMS	AGSMS	B	AGSMS
B	B	B	B	AGSMS	ORHY*	AGSMS	ORHY*	AGSMS	B
AGSMS	AGSMS	AGSMS	AGSMS	B	B	ORHY	B	ORHY*	B
B	B	ORHY*	B	ORHY*	B	MESA	ORHY*	AGSMS	B
B	B	B	ORHY*	B	B	B	B	AGSMS	AGSMS
ORHY*	ORHY*	ORHY*	AGSMS	B	B	B	AGSMS	B	AGSMS
AGSMS	AGSMS	B	AGSMS	B	AGSMS	AGSMS	ORHY*	B	B
ORHY*	B	AGSMS	AGSMS	B	B	B	B	AGSMS	AGSMS
B	B	AGSMS	B	B	AGSMS	AGSMS	AGSMS	B	B
B	B	B	ORHY*	AGSMS	B	B	B	AGSMS	AGSMS
B	AGSMS	ORHY*	B	AGSMS	B	B	B	AGSMS	B
ELSA	AGSMS	AGSMS	B	ORHY*	B	B	B	AGSMS	AGSMS
AGSMS	AGSMS	AGSMS	AGSMS	AGSMS	AGSMS	AGSMS	ORHY*	B	B
B	B	B	ORHY*	AGSMS	B	B	B	AGSMS	AGSMS

Comments & Observations Some cover in subplot 2 is very poor evidence of Fusion Rills 2-6" in depth, little evidence of Interrill Erosion

ATCU
ELCA
CHNA

Vegetation Field Notes

Company Name UP&L Date 10/5/87

Location ~~Cottonwood/Willow~~ DBD Site Natural Yard Slope Time 1200

Magnetic Heading _____ Transect # 1

Species vigor and/or % cover. 3 of 3

B		B		AGSMS		AGSMS		B		B		B		B		ORHYH		B	
ORHYH		B		AGSMS		AGSMS		B		AGSMS		AGSMS		B		B		B	
ORHYH		ORHYH		ORHYH		AGSMS		AGSMS		B		B		AGSMS		AGSMS		AGSMS	
HAGL		B		B		HAGL		ORHYH		B		AGSMS		AGSMS		ORHY		B	
HAGL		HAGL		HAGL		HAGL		ORHYH		B		B		HAGL		B		B	
HAGL		HAGL		B		L		AGROP		B		B		B		B		HAGL	
B		B		B		B		AGROP		HAGL		HAGL		HAGL		B		B	
AGROP		B		B		AGROP		B		B		CHNA		B		AGROP		B	
B		AGROP		AGROP		AGROP		R		AGROP		AGROP		AGROP		AGROP		B	
AGROP		B		B		B		AGROP		B		AGROP		AGROP		B		AGROP	

Comments & Observations _____

1987 VEGETATION SURVEY

UTAH POWER AND LIGHT COMPANY

BATHHOUSE

DES-BEE-DOVE

BATH HOUSE/DES-BEE-DOVE
INTERIM RECLAMATION SURVEY

General Background:

The Bath House property is located in a dry wash, a tributary to Grime's Wash. The property lies approximately 6 miles north of Orangeville, Utah [see Location Map - Figure 1]. The property encompasses 2.3 acres of reclaimed land. The Bath House property falls within federally leased boundaries. Elevation of the property ranges from 7500' to 76500'.

Planting Methodologies:

The Bath House property was reclaimed in the fall of 1984. The following methodologies were implemented:

The seed mixture was broadcast at the predetermined rate using hurricane spreaders. The fertilizer mixture contained 50 pounds per acre ammonium nitrate and 75 pounds per acre Triple Superphosphate and was applied separately. The slopes were then raked to turn the soil surface and covered with a $\frac{1}{2}$" layer of chopped alfalfa hay mulch [2 tons per acre]. Conwed netting was applied to retain seed and mulch on the 70% slope.

Conclusions and Recommendations:

SPECIES LIST

BATHHOUSE

SYMBOL	SCIENTIFIC NAME	COMMON NAME
AGROP	Agropyron sp.	Wheatgrass
AGCR	Agropyron crestatum	Crested wheatgrass
AGSMS	Agropyron smithii	Western wheatgrass
ORHYH	Oryzopsis hymenoides	Indian ricegrass
SIHY	Sitanion hystrix	Squirreltail grass
ELCI[2]	Elymus cinereus	Great basin wildrye
BRMA	Bromus marginatus	Mountain brome
ERIOG	Eriogonum	
HAGL	Halogeton glomerata	Halogeton
BRASS[2]	Brassica sp.	Mustard
SAKA	Salsola kali	Russian thistle
KOSP	Kochia scoparia	Belvedere summer cypress
CHNA	Chrysothamnus nauseosus	Rubber rabbit brush
CELEL	Cercocarpus ledifolius	Curl-leaf mt. mahogany

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t-Test at 90% Confidence Level

$$n = \frac{[t]^2\ [s]^2}{[10\%\ \text{mean}]^2}$$

t = 1 tail at 90% confidence is 1.299 with df = 49 [50-1]

Variance = standard deviation squared $[s^2]$ = 5.5

Sample mean $[\bar{x}]$ = 5.36

Sample size [n] = 50

Sample size needed for 90% confidence =

$$n = \frac{[1.299]^2\ [5.5]}{.287} = 32.2$$

should be at or below 50

VEGETATIVE COVER

BATHHOUSE

Vegetative Cover	40.0%
Undesirables	24.6%
HAGL	19.8%
KOSP	3.6%
BRASS[2]	0.4%
SAKA	0.8%
Desirables	15.4%
AGROP	5.4%
ELCI	0.4%
BRMA	0.8%
SIHY	1.0%
ORHY	1.8%
AGCR	4.0%
ERIOG	0.6%
CELEL	0.2%
CHNA	1.2%
Litter	3.6%
Rock	4.6%
Bare Ground	51.8%
TOTAL	100.0%

Vegetation Field Notes

Company Name UP&L **Date** 10/4/87

Location ~~Cottonwood/Ashburn~~ DSD **Site** Rathhouse **Time** 1030

Magnetic Heading 10° N **Transect #** 1

Species vigor and/or % cover. 10 of 3

AGROP	B	B	SAKA	B	R	SAKA	AGROP	B	B	
B	B	B	AGCR	L	R	AGCR	B	L	AGCR	
HAGL	B	B	B	R	B	AGSMS	AGSMS	R	B	
AGROP	B	B	B	B	R	R	BRMA	B	B	
CELEL	ERIOG	ERIOG	AGSMS	B	B	AGSMS	AGROP	AGCR	B	
B	SAKA	SAKA	B	B	R	BRMA	L	B	B	
B	AGROP	AGROP	R	L	B	B	AGROP	AGROP	L	
B	B	B	B	B	BRMA	SAKA	L	L	L	
B	L	KOSP	R	Unk	ERIOGN	B	B	L	AGROP	
R	KOSP	KOSP	AGROP	AGROP	KOSP	BRASS	B	B	KOSP	
AGROP	AGROP	L	KOSP	B	R	KOSP	KOSP	AGROP	B	
B	ORHY	AGSMS		B	B	B	KOSP	B	B	
R	AGROP	B	AGROP	B	B	B	KOSP	AGROP	STHY	
L	L	AGSMS	AGSMS	R	AGSMS	AGSMS	L	AGSMS	L	
B	B	STHY	L	KOSP	L	B	KOSP	AGROP	B	
AGSMS	AGSMS	AGSMS	AGCR		B	B	AGSMS	B	B	
KOSP	B	KOSP	B	KOSP	AGSMS	AGSMS	B	AGSMS	KOSP	
KOSP	AGSMS	L	B	AGSMS	B	ELCA	KOSP	B	B	
B	AGSMS	AGSMS	AGSMS	E	B	BRMA	B	BRMA	B	
AGSMS	AGSMS	B	AGSMS	B	AGROP	AGROP	R	AGROP	AGROP	

Comments & Observations Bromus tec. ATCO Several areas
DRU HAGL ELCI concentrated w/in
SPAI Lagomorph Sign

Evidence of grazing by lagamorphs in concentrated areas

Heather Wicker

Vegetation Field Notes

Company Name UP&L Date 10/5/87

Location ~~Collomwood/Wilberg~~ DBD Site Bathhouse Time 1030

Magnetic Heading 330° NW Transect # 1

Species vigor and/or % cover. 2 of 3

HAGL	B	B	SIHY	B	AGROP	AGSMS	AGSMS	AGROP	B
B	HAGL	AGROP	HAGL	HAGL	B	HAGL	HAGL	AGSMS	B
AGSMS	B	HAGL	HAGL	HAGL	HAGL	HAGL	HAGL	AGROP	ORHY
AGSMS	AGSMS	AGSMS	B	B	AGCR	AGCR	AGSMS	B	B
ORHY	R	AGSMS	B	SIHY	CHNA	AGSM	R	HAGL	AGSMS
B	R	B	AGSMS	AGSMS	AGSMS	AGSM	HAGL	B	SIHY
R	AGSMS	AGSMS	B	AGSMS	B	HAGL	HAGL	ELCI	B
HAGL	HAGL	B	B	B	B	B	B	B	B
CHNA	HAGL	HAGL	ORHY	HAGL	B	CHNA	CHNA	CHNA	HAGL
B	B	AGSMS	ORHY	AGCR	HAGL	HAGL	HAGL	HAGL	HAGL
B	R	AGROP	HAGL	HAGL	B	B	HAGL	AGCR	B
HAGL	HAGL	HAGL	B	HAGL	R	HAGL	HAGL	HAGL	B
B	B	B	CHNA	AGCR	R	AGCR	HAGL	ORHY	B
R	B	B	HAGL	B	HAGL	AGSMS	BRAKS[2]	HAGL	AGSMS
B	B	B	B	B	B	B	B	B	B
B	CHNA	B	B	B	B	B	B	B	B
AGCR	B	B	B	B	B	B	B	B	B
B	AGSMS	B	AGSMS	AGSMS	R	AGSMS	B	AGSMS	HAGL
AGCR	HAGL	B	HAGL	B	HAGL	B	HAGL	B	ORHY
R	HAGL	HAGL	ORHY	HAGL	HAGL	HAGL	B	HAGL	HAGL

Comments & Observations

Vegetation Field Notes

Company Name UP&L Date 10/5/97

Location ~~Cottonwood Wilderness~~ DBD Site Bathhouse Time 1030

Magnetic Heading 10° N Transect # 1

Species vigor and/or % cover. 30 / 3

HAGL	HAGL	HAGL	HAGL	HAGL	HAGL	HAGL	AGCR	HAGL	HAGL
AGCR	HAGL	HAGL	HAGL	HAGL	HAGL	HAGL	AGCR	HAGL	B
HAGL	AGCR	AGCR	B	AGCR	HAGL	AGSMS	AGSMS	B	HAGL
HAGL	HAGL	HAGL	HAGL	AGCR	HAGL	B	B	B	B
ORHY	HAGL	HAGL	AGSMS	B	AGCR	B	ORHY	ORHY	ORHY
B	B	B	B	HAGL	B	B	B	HAGL	B
B	HAGL	HAGL	HAGL	B	HAGL	HAGL	HAGL	AGROP	HAGL
B	B	ORH	B	B	B	HAG	R	HAGL	ORHY
B	B	HAGL	B	ORHY	B	B	HAGL	B	HAGL
B	HAGL	ORHY	HAGL	HAGL	HAGL	HAGL	HAGL	B	B

Comments & Observations MSOF = purple

1987 VEGETATION SURVEY

UTAH POWER AND LIGHT COMPANY

SEDIMENT POND

DES-BEE-DOVE

SEDIMENT POND - DES-BEE-DOVE
INTERIM RECLAMATION SURVEY

General Background:

The Sediment Pond property is located in a dry wash, a tributary to Grime's Wash. The property lies approximately 6 miles north of Orangeville, Utah [see Location Map - Figure 1]. The property encompasses 0.7 acres of reclaimed land. The Sediment Pond area is located on state leased property. Elevation of the property is approximately 6750'.

Planting Methodology:

The Sediment Pond area was reclaimed in the fall of 1985. The following methodologies were implemented:

The seed mixture was broadcast at the predetermined rate using hurricane spreaders. The fertilzers mixture contained 50 pounds per acre ammonium nitrate and 75 pounds per acre Triple Superphosphate which was applied as a separate applications. The area was then raked to turn the soil surface and covered with a $\frac{1}{2}$" layer of chopped alfalfa hay [2 tons per acre] for mulch.

Conclusions and Recommendations:

The survey was completed October 10, 1987. The overall appearance of the entire site was poor, with undesirable species making up the

majority of the vegetation. Plant vigor is fair. Use of the area by deer and rabbits is evident, however, impacts from such activity is not significant. No evidence of erosion is present.

It appears at this time, the only recommendation which the survey data indicate is to continue to monitor the site for further establishment of desirable plant species.

Survey results, species list, example of field notes are included as Attachment 7.

ATTACHMENT 7

SEED MIXTURE

SEDIMENT POND

SCIENTIFIC NAME	COMMON NAME
Elymus salinus	Salina wild rye
Orzopsis hymenoides	Indian ricegrass
Sitanion hystrix	Squirreltail grass
Elymus cinereus	Great basin wild rye
Eriogonum corymbosum	Coryumbed eriogonum
Melilotus officinalis	Yellow sweetclover
Atriplex cuneatus	Cuneate salt brush
Atriplex confertifolia	Shadscale
Penstemon eatonii	Eaton penstemon
Atriplex canescens	4-wing salt bush

SPECIES LIST

SEDIMENT POND

SYMBOL	SCIENTIFIC NAME	COMMON NAME
ORHYH	Oryzopsis hymenoides	Indian ricegrass
AGROP	Agropyron sp.	Wheatgrass
SAKA	Salsola kali	Russian thistle
HAGL	HAlogeton glomerata	Halogeton
ATCA[2]	Atriplex canescens	4-wing
ATCO	Atriplex confertifolia	Shadscale

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t-Test at 90% Confidence Level

$$n = \frac{[t]^2\ [s]^2}{[10\%\ \text{mean}]^2}$$

t = 1 tail at 90% confidence is 1.299 with df = 49 [50-1]

Variance = standard deviation squared [s^2] = 1.55

Sample mean [$\bar{x}$] = 5.8

Sample size [n] = 50 plots

Sample size needed for a 90% confidence=

$$n = \frac{[1.299]^2\ [1.55]}{.336} = 7.78$$

should be at or below 50

VEGETATIVE COVER

SEDIMENT POND

Vegetative Cover		55.6%
Undesirables		45.4%
SAKA	25.0%	
HAGL	20.4%	
Desirables		10.2%
ORHYH	1.8%	
AGROP	2.6%	
ATCA[2]	4.8%	
ATCO	1.0%	
Litter		11.0%
Rock		4.2%
Bare Ground		29.2%
TOTAL		100.0%

Vegetation Field Notes

Company Name UP&L Date 10/5

Location ~~Cottonwood/Wilmington~~ DBD Site Sediment Pond Time 1345

Magnetic Heading 180° S Transect # 1

Species vigor and/or % cover. 1 of 3

SAKA	SAKA	SAKA	B	HAGL	B	B	HAGL	HAGL	HAGL
B	B	HAGL	SAKA	AGROP	B	HAGL	HAGL	AGROP	B
B	HAGL	B	HAGL	B	HAGL	B	HAGL	HAGL	HAGL
L	B	R	HAGL	AGROP	L	ORHY	HAGL	HAGL	B
B	SAKA	HAGL	HAGL	B	B	HAGL	L	HAGL	R
ATCO	ATCO	B	AGROP	B	B	HAGL	ATCU	B	L
SAKA	B	SAKA	ATCU	ATCU	ATCU	SAKA	HAGL	L	ATCU
L	B	B	HAGL	B	ATCU	B	B	SAKA	SAKA
SAKA	B	B	SAKA	SAKA	ATCU	HAGL	HAGL	HAGL	HAGL
B	B	SAKA	HAGL	HAGL	HAGL	B	HAGL	HAGL	ATCU
SAKA	L	SAKA	L	SAKA	ATCU	ATCU	ATCU	L	L
L	L	SAKA	SAKA	HAGL	B	ATCU	HAGL	L	B
SAKA	HAGL	B	HAGL	HAGL	SAKA	B	B	SAKA	HAGL
HAGL	L	L	B	R	B	SAKA	AGROP	B	L
SAKA	ATCU	ATCU	ATCU	ATCU	C	SAKA	SAKA	SAKA	B
SAKA	SAKA	B	B	HAGL	B	HAGL	L	HAGL	HAGL
HAGL	B	B	HAGL	HAGL	B	HAGL	B	B	B
ATCU	ATCU	SAKA	ATCU	SAKA	SAKA	SAKA	B	B	B
ORHY	B	HAGL	SAKA	SAKA	SAKA	SAKA	HAGL	HAGL	SAKA
HAGL	B	SAKA	HAGL	B	B	B	SAKA	SAKA	HAGL

Comments & Observations Brassica

Heather Welker

Vegetation Field Notes

Company Name UP&L — **Date** 10/8/87

Location ~~Cottonwood, Utah~~ DSD, **Site** Sediment Pond — **Time** 1400

Magnetic Heading 180° S — **Transect #** 1

Species vigor and/or % cover. 50%

L	SAKA	B	L	L	HAGL	L	B	ATCU	ATCU
HAGL	B	SAKA	HAGL	B	R	AGROP	L	B	AGROP
B	B	ASCH	B	B	ORHY	HAGL	SAKA	SAKA	L
L	SAKA	SAKA	SAKA	SAKA	B	AGROP	L	SAKA	SAKA
B	HAGL	HAGL	B	SAKA	HAGL	ORHY	L	L	AAGL
B	R	SAKA	ORHY	L	SAKA	ORHY	L	SAKA	SAKA
HAGL	L	ORHY	HAGL	L	ATCO	L	SAKA	L	SAKA
SAKA	SAKA	ORHY	L	HAGL	ATCO	SAKA	B	B	B
SAKA	B	SAKA	B	HAGL	SAKA	B	SAKA	HAGL	B
ORHY	B	B	SAKA	B	SAKA	L	SAKA	SAKA	SAKA
SAKA	B	HAGL	SAKA	HAGL	B	B	AGROP	AGROP	B
SAKA	SAKA	SAKA	SAKA	SAKA	R	L	SAKA	SAKA	B
L	B	SAKA	B	SAKA	SAKA	SAKA	SAKA	SAKA	SAKA
SAKA	SAKA	SAKA	SAKA	B	R	SAKA	B	SAKA	SAKA
B	B	SAKA	SAKA	SAKA	SAKA	SAKA	SAKA	ATCO	B
SAKA	SAKA	SAKA	HAGL	HAGL	B	SAKA	ATCO	SAKA	B
B	HAGL	R	L	HAGL	SAKA	SAKA	B	SAKA	ORHY
L	L	ATCU	B	L	B	HAGL	L	B	B
L	HAGL	L	B	L	B	B	R	SAKA	L
B	SAKA	SAKA	SAKA	SAKA	AGROP	B	B	SAKA	AGROP

Comments & Observations Above the cross [illegible] was much disturbed. Evidence of [illegible] sediment pond & GRAZING

Vegetation Field Notes

Company Name UP & L Date 10/5/87

Location ~~Cottonwood/Willard~~ DBD Site Sediment Pond Time 1410

Magnetic Heading 180°S Transect # 1

Species vigor and/or % cover. 3 of 3

SAKA	SAKA	L	HAGL	SAKA	SAKA	ATCU	L	L	L
B	HAGL	SAKA	B	B	HAGL	B	B	B	L
HAGL	B	B	B	B	L	ORHU	L	AGROP	B
HAGL	HAGL	HAGL	ATCU	SAKA	ORHU	L	SAKA	B	SAKA
SAKA	SAKA	ATCU	L	B	SAKA	SAKA	SAKA	B	L
HAGL	HAGL	HAGL	HAGL	B	R	HAGL	HAGL	B	B
R	R	R	R	B	HAGL	HAGL	R	R	B
R	HAGL	HAGL	R	R	HAGL	L	R	HAGL	B
R	HAGL	HAGL	B	HAGL	B	HAGL	HAGL	HAGL	B
HAGL	ATCU	HAGL	HAGL	B	HAGL	B	HAGL	B	HAGL

Comments & Observations Deer Scat Present

Grazing by large morphic [illegible]

1987 VEGETATION SURVEY

UTAH POWER AND LIGHT COMPANY

PIPELINE/DEER CREEK CANYON

PIPELINE - DEER CREEK CANYON
INTERIM RECLAMATION SURVEY

General Background:

The Pipeline reclamation area is located on Deer Creek, a tributary to Huntington Creek. The property lies approximately 7 miles northwest of Huntington, Utah [see Location Map - Figure 1]. The property encompasses 3.5 acres of reclaimed lans. Portions of the property are under private, state and federal ownership. Elevation of the property ranges from 6600' to an elevation of 7500'.

Planting Methodologies:

The Pipeline property was reclaimed in the fall of 1986. The following methodologies were implemented:

The seed mixture was hydrosprayed at the predetermined rate using a Bowie hydroseeder. The seed was then oversprayed with 2000 pounds per acre of wood fiber mulch. The mulch application was fortified with 100 pounds per acre of 16-16-8 fertilizer and 100 pounds per acre of Terra-Tac N.F. The tac was used in order to help adhere the mulch to the steeper areas.

Conclusions and Recommendations:

This survey was completed October 11, 1987. The overall appearance of the entire site is good. Plant vigor is good. The majority of the

species appear to be well established and have not been adversely impacted by grazing, insects or rodents. A small drainage located in the north portion of the property allowed for soil movement. No other signs of erosion is evident.

It appears at this time the only recommendation which the survey data indicates is to continue to monitor the area for further vegetation establishment.

Survey results, species list, example of field notes are included as Attachment 8.

ATTACHMENT 8

SEED MIXTURE

PIPELINE/DEER CREEK

SCIENTIFIC NAME	COMMON NAME
Agropyron Smithii	Western Wheatgrass
Oryzopsis hymenoides	Indian ricegrass
Agropyron dasystachyum	Thickspike wheatgrass
Elymus cinereus	Great basin wildrye
Sitanion hystrix	Bottlebrush squirreltail
Elymus salinus	Salina wildrye
Hedysarum boreale	Utah Sweetvetch
Penstemon palmeri	Palmer penstemon
Medicago sativa	Ladak alfalfa
Melolotus officinalis	Yellow sweetclover
Aster chilensis	Pacific aster

SPECIES LIST

DEER CREEK - PIPELINE

SYMBOL	SCIENTIFIC NAME	COMMON NAME
AGROP	Agropyron sp.	Wheatgrass
BRMA	Bromus marginatus	Mountain brome
MEOF	Melilotus officinalis	Yellow sweetclover
SAKA	Salfola kali	Russian thistle
PEPA	Penstemon palmeri	Palmer penstemon
HEBO	Hedysarum boreale	Northern sweetvetch
CHNA	Chrysothamnus nauseosus	Rubber rabbit brush

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t-Test at 90% Confidence Level

n = 50 plots

$$n = \frac{[t]^2\ [s]^2}{[10\%\ \text{mean}]^2}$$

t = 1 tail at 90% confidence is 1.299 with df = 49 [50-1]

Variance = standard deviation squared $s^2 = 1.93$

Sample mean $[\bar{x}] = 1.5$

Sample size [n] = 50

Sample size needed for a 90% confidence=

$$n = \frac{[1.299]^2\ [1.93]}{.02} = 162.8$$

should be at or below 50*

* The pipeline property shows a large amount of variability in vegetative cover. The maximum number of samples required by DOGM [50] is still insufficient in accounting for all variability.

VEGETATIVE COVER

DEER CREEK PIPELINE

Vegetative Cover		15.0%
Undesirable Species		2.6%
SAKA	2.6%	
Desirable Species		12.4%
AGROP	9.8%	
BRMA	.2%	
MEOF	1.6%	
PEPA	.2%	
CHNA	.6%	
Litter		.2%
Rock		.4%
Bare Ground		84.4%
TOTAL		100.0%

Vegetation Field Notes

Company Name UP&L **Date** 10/11/87

Location Huntington Power Site Lear Oil - Pipeline **Time** _____

Magnetic Heading 210° SW **Transect #** 1225

Species vigor and/or % cover. 1 of 3

SAKA	B	SANA	B	B	B	B	B	B	B	MEOF
	B	B	B	MEOF	B	B	B	B	B	B
	B	B	AGROP	AGROP	B	B	B	B	B	B
	B	B	B	B	B	B	B	B	B	B
	B	B	B	B	B	B	B	B	B	B
	B	B	B	B	B	B	B	B	B	B
PEPA	B	B	B	AGROP	B	B	AGROP	B	B	B
	B	B	B	B	B	B	B	B	PEPA	B
	B	B	B	B	B	B	B	B	MEOF	B
	B	B	B	B	B	B	B	SAKA	B	B
	B	B	B	B	B	B	B	B	B	B
	B	B	B	B	B	B	AGROP	B	B	B
	B	B	B	B	SAKA	B	B	B	B	AGROP
	B	B	B	B	B	B	B	B	B	B
RTE	B	AGROP	AGROP	B	B	B	B	SAKA	SAKA	SAKA
	B	B	B	B	B	B	B	SAKA	AGROP	B
	B	B	B	B	B	B	B	B	B	B
	B	B	B	B	AGROP	B	B	B	B	B
	B	AGROP	B	B	B	B	B	B	B	B
	B	B	B	B	B	B	AGLOP	B	AGLOP	B
	B	B	B	AGROP	B	B	B	B	B	B

Comments & Observations Hunter Walker

Cow Scat present

Vegetation Field Notes

Company Name UPSL **Date** 10/11/87

Location Huntington Drainage **Site** Deer Creek - Pipeline **Time**

Magnetic Heading **Transect #** 1

Species vigor and/or % cover. 2 of 3

B	B	B	B	B	B	B	B	B	B
B	B	B	B	B	B	B	B	B	B
B	B	B	L	AGROP	AGROP	AGROP	AGROP	SALT	B
B	B	B	B	B	B	B	B	B	B
B	MEOF	B	R	R	B	B	B	B	B
B	B	B	B	AGROP	B	B	B	B	B
B	B	B	B	AGROP	B	B	B	B	R
B	B	B	AGROP	B	R	BRMA	B	B	B
AGROP	B	AGROP	B	B	B	B	B	B	B
B	B	B	B	B	B	B	B	B	B
MEOF	MEOF	B	B	B	B	B	B	B	B
B	B	B	B	B	B	B	B	B	B
AGROP	B	B	B	B	AGROP	B	B	B	B
B	B	B	AGROP	B	B	B	B	B	B
CHNA	B	AGROP	B	B	AGROP	B	B	B	B
B	B	AGROP	AGROP	B	B	B	AGROP	B	B
SALT	MEOF	AGROP	B	AGROP	B	B	B	B	B
AGROP	B	B	B	AGROP	B	B	B	B	B
AGROP	AGROP	B	B	B	B	AGROP	AGROP	B	B
B	B	AGROP	B	B	B	B	B	B	B

Comments & Observations [illegible] Utah Sweetvetch

Looked like horse [illegible]

Vegetation Field Notes

Company Name LIP&L Date 10/11/87

Location Huntington Drainage Site Deer Creek - Pipeline Time

Magnetic Heading Transect # 1

Species vigor and/or % cover. 3 of 3

	B		B		B		B		B		B		B		B		B		B
RHY	CHNA		MEOF		B		B		B		AGROP		B		AGROP		B		B
ACK	B		B		B		B		SAKA		B		B		B		B		SAKA
	B		B		B		B		B		B		B		B		B		B
	B		SAKA		SAKA		SAKA		B		B		AGROP		B		B		AGROP
	B		B		B		B		B		B		B		B		B		AGROP
	B		B		B		B		B		B		B		B		B		AGROP
	B		B		AGROP		B		B		B		B		B		B		B
	B		B		B		R		AGROP		B		B		B		B		R
	B		B		AGROP		B		B		B		B		B		B		B

Comments & Observations Heather Walker

Lagomorph scat present [illegible]

1987 VEGETATION SURVEY

UTAH POWER AND LIGHT COMPANY

SUBSOIL STORAGE

COTTONWOOD FAN PORTAL

SUBSOIL STORAGE - COTTONWOOD FAN PORTAL

INTERIM RECLAMATION SURVEY

General Background:

The Subsoil Storage property is located in the Cottonwood Creek drainage approximately 8 miles northwest of Orangeville, Utah [see Location Map - Figure 1]. The property encompasses 0.6 acres of reclaimed land. Elevation of the property is approximately 7,400' to 7,700'.

Planting Methodologies:

The Subsoil Storage area was reclaimed in 1981. The following methodologies were implemented:

The seed mixture was broadcast at a predetermined rate. The slopes were then hand raked to turn the soil surface. Ammonium nitrate and triple superphosphate fertilizers were spread in the trenches. Container-grown shrubs were transplanted along the terraces formed by the trenches.

Conclusions and Recommendations:

The survey was completed September 29, 1987. The overall appearance of the entire site is excellent with no undesirable vegetation located during the survey. Plant vigor is good with most species appearing to be well established. There is no adverse impacts from grazing,

insects or rodents. Little evidence of erosion is present with the straw bales still functioning properly. There is some dusting of ground and vegetation with coal powder as it drifts across the road from the load-out facilities of Beaver Creek Coal Company's Trail Mountain Mine Loadout.

The only recommendation at this point is to continue monitoring the site for further vegetation establishment.

Survey results, species list, example of field notes are included as Attachment 9.

ATTACHMENT 9

SEED MIXTURE

SUBSOIL STORAGE - COTTONWOOD FAN PORTAL

SCIENTIFIC NAME	COMMON NAME
Grasses	
Agropyron smithii var. Rosanna	Western wheatgrass
Elymus salinus var. Magnar	Great basin wildrye
Oryzopsis hymenoides var. Paloma	Indian ricegrass
Forbs	
Aster chilensis	Pacific aster
Melilotus officinalis	Yellow sweetclover
Hedysarum boreale	Northern sweetvetch
Seedlings	
Atriplex cuneata	Cuneate saltbush
Artemisia tridentata	Big sagebrush
Chrysothamnus viscidiflorus	Little rabbitbrush
Ephedra viridis	Mormon tea

SPECIES LIST

SUBSOIL STORAGE

SYMBOL	SCIENTIFIC NAME	COMMON NAME
GRASSES		
AGSMS	Agropyron smithii	Western wheatgrass
AGROP	Agropyron sp.	Wheatgrass
ELCI[2]	Elymus cinereus	Great basin wildrye
AGCR	Agropyron cristatum	Crested wheatgrass
BRMA	Bromus marginatus	Mountain brome
DAGL	Dactylis glomerata	Orchard grass
Forbs		
MESA	Medicago sativa	Alfalfa
ASCH[2]	Aster chilensis	Pacific aster
PENST	Penstemon sp.	Penstemon
Shrubs		
CHNA	Chrysothamnus nauseosus	Rubber rabbit brush
ARNI	Artemesia niger	Black sage
ATCO	Atriplex confertifolia	Shadscale
ATCA[2]	Atriplex canescens	4-wing salt bush

t-Test at 90% Confidence Level

$$n = \frac{[t]^2\ [s]^2}{[10\%\ \text{mean}[^2}$$

t = 1 tail at 90% confidence is 1.299 with df = 49 [50-1]

Variance = standard deviation squared [s^2] = 5.3

Sample mean [$\bar{x}$] = 3.8

Sample size [n] = 50

Sample size needed for 90% confidence

$$n = \frac{[1.299]^2\ [5.3]}{.14} = 63.9$$

should be at or below 50*

* The Subsoil Storage area shows a large amount of variability in vegetative cover. The maximum number of samples required by DOGM [50] is still insufficient in accounting for all variability.

VEGETATIVE COVER
SUBSOIL STORAGE

Vegetative Cover	32.4%
Undesirables	0%
Desirables	32.4%
AGCR	2.0%
AGROP	6.8%
AGSMS	1.6%
DAGL	0.4%
ORHYH	0.4%
ELCI	18.4%
BRMA	0.2%
MESA	0.4%
ASCH[2]	0.8%
ATCA[2]	0.8%
ATCO	0.2%
CHNA	0.4%

Litter	3.0%
Rock	11.6%
Bare Ground	53.0%
TOTAL	100.0%

Vegetation Field Notes

Company Name UP+L Date 9/29/87

Location Cottonwood/Wilberg Site Subsoil Storage Time 11:40

Magnetic Heading _____ Transect # 1

Species vigor and/or % cover. 1 of 3

R	ASCH	R	ASCH	R	ASCH	ASCH	AGSMS	R	R	
ARTR	AGSA	AGROP	B	AGROP	B	B	B	AGROP	AGROP	
R	R	B	B	B	ELCI	ELCI	ATCO	AGCR	R	
ATCU	ATCU	ATCU	AGSMS	L	AGROP	R	R	B	B	
B	B	B	R	B	ELCI	B	R	R	B	
B	B	ELCI	BRMA	AGCR	AGSMS	AGSMS	AGCR	AGSM	B	
B	ELCI	B	B	B	B	ASCH	ASCH	DAGL	L	
B	B	B	B	B	B	B	B	B	B	
ELCI	ELCI	ELCI	ELCI	ELCI	ELCI	ELCI	AGROP	ELCI	ELCI	
ELCI	B	B	B	B	ELCI	ELCI	ELCI	B	B	
R	R	R	R	AGROP	B	ELCI	ELCI	AGROP	B	
B	B	B	B	B	B	B	B	B	B	
AGROP	B	B	B	ELCI	AGROP	B	ELCI	B	B	
ELCI	ELCI	R	B	B	DAGL	AGROP	AGCR	AGROP	L	
B	B	R	R	B	B	R	AGSMS	R	R	
B	B	B	R	B	AGROP	AGROP	B	AGROP	AGROP	
B	B	R	B	B	B	B	B	B	B	
ELCI	ELCI	AGSMS	ELCI	B	L	AGROP	AGROP	B	B	
AGROP	B	B	ELCI	L	ELCI	ELCI	L	AGROP	ELCI	
B	R	ELCI	ELCI	R	AGROP	B	R	R	ELCI	

Comments & Observations ELCI ✓ ATCO ATNI ✓ ✓
AGCR ✓ ASCH ✓ ASMS ✓ Dan Thonia Bactylus
CHNA ATCU PENST ✓

Heather Weeker

Vegetation Field Notes

Company Name UP&L Date 9/29

Location Cottonwood/Wilberg Site Subsoil Storage Time 1140

Magnetic Heading _____ Transect # 1

Species vigor and/or % cover. 2 of 3

ELST	ELST	ELST	ELCI	ELCI	AGROP	AGROP	B	AGROP	ELSA	
B	B	R	B	R	ELSA	R	R	R	AGROP	
R	ELST	B	B	L	R	B	B	R	ELCI	
ELST	ELST	ELCI	ELCI	ELCI	R	B	B	B	R	
R	R	R	R	R	B	ELSA	AGROP	B	B	
B	ORHYA	B	ORHYA	B	ELCI	CHNA	ELST	AGROP	AGROP	
L	R	B	R	B	ELST	ELSA	B	ELST	B	
ELSA	B	B	B	AGROP	B	B	B	AGROP	B	
B	B	L	ELCI	ELCI	ELST	ELST	L	ELSA	ELST	
B	B	B	ELCI	B	ELSA	B	R	R	B	
B	B	ELCI	B	R	AGROP	R	ELST	R	B	
AGROP	AGROP	ELST	AGROP	B	L	B	ELST	B	B	
AGSMS	B	B	B	AGROP	ELSA	ELST	B	B	B	
R	AGROP	ELSA	ELST	AGROP	AGROP	B	AGROP	B	AGROP	
B	AGROP	B	B	B	ELST	B	B	B	AGROP	
B	B	AGROP	B	AGROP	B	AGROP	B	B	B	
B	B	B	B	B	B	AGROP	AGROP	B	B	
B	B	B	B	AGROP	B	B	B	B	CHNA	
AGROP	R	AGROP	AGROP	L	ELSA	ELST	ELST	ELSA	ELSA	
AGROP	R	ELST	L	B	ELSA	ELSA	ELSA	B	B	

40

Comments & Observations _____

Vegetation Field Notes

Company Name UP&L Date 9/29/87

Location Cottonwood/Wilberge Site Subsoil Storage Time 1140

Magnetic Heading _____ Transect # 1

Species vigor and/or % cover. 3 of 3

B	B	B	B	ELCI	ELCI	B	B	ELCI	B
ELCI	ELCI	ELCI	B	B	B	B	B	B	B
B	B	B	B	B	B	B	B	B	B
B	B	AGCR	B	B	B	B	B	B	B
AGCR	AGCR	L	AGCR	B	B	B	B	B	B
B	B	B	AGLOP	B	B	B	B	B	B
ELCI	ELCI	ELCI	AGLOP	B	B	B	B	B	B
ELCI	ELCI	ELCI	B	B	B	B	B	B	B
B	B	B	B	AGCR	AGCR	ELCI	L	B	B
ARCA	ELCI	AGCR	AGCR	B	B	AGLOP	AGLOP	L	B

Comments & Observations _____

1987 VEGETATION SURVEY

UTAH POWER AND LIGHT COMPANY

TOPSOIL STORAGE

COTTONWOOD FAN PORTAL

TOPSOIL STORAGE - COTTONWOOD FAN PORTAL

INTERIM RECLAMATION SURVEY

General Background:

The Topsoil Storage property is located in the Cottonwood Creek drainage approximately 8 miles northwest of Orangeville, Utah [see Location Map - Figure 1]. The property encompasses 0.2 acres of reclaimed land. Elevation of the property is approximately 7,400' to 7,700'.

Planting Methodologies:

The Topsoil Storage area was reclaimed in 1981. The following methodologies were implemented:

The seed mixture was broadcast at a predetermined rate. The slopes were then hand raked to turn the soil surface. Ammonium nitrate and triple superphosphate fertilizers were spread in the trenches. Container-grown shrubs were transplanted into the trenches.

Conclusions and Recommendations:

The survey was completed September 29. 1987. The overall appearance of the entire site is excellent with a majority of the vegetative cover consisting of desirable species. Plant vigor is good with most species appearing to be well established. There is no adverse impacts from grazing, insects or rodents. No evidence of erosion is present. There

is some dusting of ground and vegetation with coal powder as it drifts across the road from the Trail Mountain Mine loadout facilities.

The only recommendation at this point is to continue conitoring the site for further vegetation establishment.

Survey results, species list, example of field notes are included as Attachment 10.

SEED MIXTURE

TOPSOIL STORAGE - COTTONWOOD FAN PORTAL

SCIENTIFIC NAME	COMMON NAME
Grasses	
Agropyron smithii var. Rosanna	Western wheatgrass
Elymus salinus var. Magnar	Great basin wildrye
Oryzopsis hymenoides var. Paloma	Indian ricegrass
Forbs	
Aster chilensis	Pacific aster
Melilotus officinalis	Yellow sweetclover
Hedysarum boreale	Northern sweetvetch
Seedlings	
Atriplex cuneata	Cuneate saltbush
Artemisia tridentata	Big sagebrush
Chrysothamnus viscidiflorus	Little rabbitbrush
Ephedra viridis	Mormon tea

SPECIES LIST

TOPSOIL STORAGE - COTTONWOOD FAN PORTAL

SYMBOL	SCIENTIFIC NAME	COMMON NAME
Grasses		
AGSMS	Agropyron smithii	Western Wheatgrass
AGROP	Agropyron sp.	Wheatgrass
DAGL	Dactylis glomerata	Orchard grass
ELCI[2]	Elymus cinereus	Great basin wildrye
AGCR	Agropyron cristatum	Crested wheatgrass
Forbs		
HEBO	Hedysarium boreale	Northern sweetvetch
ASCH[2]	Aster chilensis	Pacific aster
MEOF	Melilotus officinalis	Yellow sweetclover
CIAR	Cirsium arvense	Canada thistle
Shrubs		
ARTR	Artemesia tridentata	Big sagebrush
ARNI	Artemesia niger	Black sage
ATCO	Atriplex confertifolia	Shadscale
ATCA[2]	Atriplex canescens	4-wing saltbush

t-Test at 90% Confidence Level

$$n = \frac{[t]^2\ [s]^2}{[10\%\ \text{mean}]^2}$$

t = 1 tail at 90% confidence is 1.299 with df = 49 [50-1]

Variance = standard deviation squared [s^2] = 4.4

Sample mean [$\bar{x}$] =

Sample size [n] = 50

Sample size needed for a 90% confidence

$$n = \frac{[1.299]^2\ [4.2]}{.105} = 67.5$$

Should be at or below 50*

* The Topsoil Storage area shows a large amount of variability in the vegetative cover. The maximum number of samples required by DOGM [50] is still insufficient in accounting for all the variability.

VEGETATION COVER

TOPSOIL STORAGE - COTTONWOOD FAN PORTAL

Vegetation Cover	30.4%
Undesirables	0.2%
CIAR	0.2%
Desirables	30.2%
AGSMS	8.4%
AGROP	6.6%
AGCR	7.6%
ELCI	3.8%
DAGL	0.2%
MEOF	0.2%
ASCH[2]	1.6%
HEBO	0.8%
CHNA	0.8%
ARTR	0.2%
Litter	6.0%
Rock	5.2%
Bare Ground	58.4%
TOTAL	100.0%

Vegetation Field Notes

Company Name UP&L **Date** 9/29/87

Location Cottonwood/Wilberg **Site** Topsoil Storage **Time** 1140

Magnetic Heading _____ **Transect #** 1

Species vigor and/or % cover. 1 of 3

AGSMS	AGSMS	AGSMS	AGSMS	AGSMS	AGROP	R	AGROP	AGROP	AGROP
AGROP	ELCI	HEBO	AGROP	L	AGSMS	AGSMS	[illegible]	AGROP	AGROP
B	ELCI	AGSMS	B	AGSMS	R	HEBO	HEBO	HEBO	AGSMS
AGROP	B	B	B	B	ASCH 2	ASCH 2	AGROP	B	AGSMS
L	B	B	AGSMS	B	MEOF	B	AGROP	B	B
B	AGSMS	AGSMS	AGSMS	AGSMS	AGSMS	AGSMS	AGSMS	R	B
AGROP	B	AGROP	B	R	B	B	R	B	AGSMS
B	AGROP	AGROP	AGROP	AGSMS	B	B	B	AGSMS	AGSMS
B	AGSMS	AGSMS	B	B	B	AGSMS	B	B	B
AGROP	B	ASCH	B	B	B	AGSMS	L	B	B
B	L	B	L	B	B	B	B	B	B
AGROP	B	AGCR	B	B	L	ASCH 2	R	C	B
B	L	B	B	AGSMS	B	B	B	AGCR	L
B	AGCR	B	L	B	B	B	B	B	B
B	B	ELCI	B	B	L	ELCI	ELCI	ELSA	L
B	B	B	ASCH 2	B	B	ELCI	L	B	B
AGCR	B	B	B	B	B	R	ELCI	AGCR	R
B	AGCR	CIAR	B	B	B	AGCR	B	B	B
B	B	B	B	B	ASCH 2	ASCH 2	ASCH 2	ASCH 2	B
B	B	B	L	R	ELSA	ELSA	ASCH 2	ELSA	ASCH 2

? TRIGMS

Comments & Observations AGSMS ✓ ASCH ✓ MEOF ✓ ATCO

AGROP ✓ ARTR ✓ ? ARNI black sage ✓

ELSA ✓ DACTYLOGLOMUS ✓ AGCR ✓ ATCA

CIRSIUM ✓

Vegetation Field Notes

Company Name UP&L Date 9/29/87

Location Cottonwood/Wilberge Site Topsoil Storage Time 1140

Magnetic Heading _____ Transect # 1

Species vigor and/or % cover. 2 of 3

AGCR	AGCR	AGCR	R	AGCR	B	B	B	R	B
B	B	AGSMS	B	B	B	B	CHNA	B	B
B	B	B	B	B	B	AGCR	AGCR	AGCR	B
B	AGCR	L	B	B	B	B	L	B	B
AGCR	B	B	B	B	AGCR	AGCR	AGCR	B	B
B	B	B	B	AGCR	B	B	B	B	AGSMS
B	AGCR	AGCR	AGCR	R	R	B	B	B	AGCR
R	B	B	B	B	AGCR	AGCR	AGCR	AGSMS	L
B	R	B	B	B	B	L	AGCR	R	B
B	B	B	L	B	AGSMS	AGSMS	AGSMS	AGCR	B
R	B	B	B	B	AGROP	AGROP	B	R	B
B	B	B	B	B	B	ELCT	AGCR	ELCT	B
B	B	B	B	B	B	CHNA	B	AGCR	L
B	B	B	B	B	B	B	B	L	AGCR
AGROP	B	AGROP	AGROP	L	B	L	CHNA	B	B
B	B	B	AGROP	AGROP	B	L	B	B	B
B	B	B	L	B	B	AGSMS	B	B	AGROP
B	B	B	B	R	B	ARTR	B	B	B
B	AGSMS	AGSMS	B	B	CHNA	B	B	B	B
R	R	B	B	B	B	B	B	B	B

40

Comments & Observations

Some of the Agropyron Cross has been grazed - unable to identify specie

Evidence of Cattle use - Scats

Cool dusting Evident.

almost too small an area to complete 50 sample plots.

Vegetation Field Notes

Company Name UP&L Date 9/29

Location Cottonwood/Wilburg Site Topsoil Storage Time 1140

Magnetic Heading _____ Transect # 1

Species vigor and/or % cover. 3 of 3

AGSMS	B	AGROP	ASCH[4]	ASCH[4]	B	B	B	B	AGROP
AGSMS	AGSMS	B	B	B	AGSMS	AGROP	AGROP	AGROP	B
B	L	R	ASCH[2]	L	B	B	AGROP	AGCR	B
B	B	L	SLCI	B	B	ASCH[2]	B	B	B
ASCH[2]	ASCH[2]	SLCI	SLCI	SLCI	R	L	B	B	B
B	B	L	B	B	B	B	L	AGCR	B
L	AGSMS	AGCR	AGCR	AGCR	B	B	B	B	R
B	SLCI	AGCR	SLCI	B	B	B	B	B	B
B	B	B	L	B	AGROP	AGROP	B	B	B
B	B	B	B	B	B	B	B	R	R

Comments & Observations _____

1987 VEGETATION SURVEY

UTAH POWER AND LIGHT COMPANY

4TH EAST ROAD

COTTONWOOD/WILBERG

4TH EAST ROAD - COTTONWOOD/WILBERG

INTERIM RECLAMATION SURVEY

General Background:

The 4th East Road is located on the Grimes Wash, a tributary to Cottonwood Creek. The property lies approximately 7 miles nortwest of Orangeville, Utah [see Location Map Figure 1]. The area encompasses 0.1 acres of reclaimed land and is located within the federal lease boundary. The elevation of the site is 7,650'.

Planting Methodologies:

The area was reclaimed in the fall of 1986. The following methodologies were implemented:

The seed mixture was broadcast at a predetermined rate using hurricane spreaders. Ammonium nitrate and triple superphosphate were applied at 50 pounds per acre and 75 pounds per acre, respectively. The soil surface was raked to cover the seed and fertilizer application. A Curlex blanket was placed over the seeded area and pinned in place.

Conclusions and Results:

The survey was completed October 27th, 1987. The overall appearance of the entire site is good. Plant vigor is good with the majority of

the vegetative cover consisting of desirable plant species. Some browsing of sweetclover is evident however, no adverse impacts from grazing, insects and rodents is present. No evidence of erosion is present.

It appears at this time that the only recommendation which the survey data indicated is to continue to monitor the site for further vegetation establishment.

Survey results, species list, examples of field notes are included as Attachment 11.

ATTACHMENT 11

SEED MIXTURE

4TH EAST ROAD - COTTONWOOD/WILBERG

SCIENTIFIC NAME	COMMON NAME
Agropyron Smithii	Western Wheatgrass
Oryzopsis hymenoides	Indian ricegrass
Agropyron dasystachyum	Thickspike wheatgrass
Elymus cinereus	Great basin wildrye
Sitanion hystrix	Bottlebrush squirreltail
Elymus salinus	Salina wildrye
Hedysarum boreale	Utah Sweetvetch
Penstemon palmeri	Palmer penstemon
Medicago sativa	Ladak alfalfa
Melolotus officinalis	Yellow sweetclover
Aster chilensis	Pacific aster

SPECIES LIST

4TH EAST ROAD - COTTONWOOD/WILBERG

SYMBOL	SCIENTIFIC NAME	COMMON NAME
AGSMS	Agropyron smithii	Western wheatgrass
ORHYH	Oryzopsis hymenoides	Indian rice grass
MEOF	Melilotus officinalis	Yellow sweetclover
KOSP	Kochia scoparia	Belvedere summer cypress
SAKA	Salsola kali	Russian thistle
ELSA	Elymus salinus	Salina wildrye

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t-Test at 90% Confidence Level

$$n = \frac{[t]^2\ [s]^2}{[10\%\ \text{mean}]^2}$$

t = 1 tail at 90% confidence is 1.299 with df = 49 [50-1]

Variance = standard deviation squared $[2]^2 = 6.06$

Sample mean $[\bar{x}] = 4.8$

Sample size [n] = 50

Sample size needed for a 90% confidence

$$n = \frac{[1.299]^2\ [6.06]}{.23} = 44.5$$

Should be at or below 50

VEGETATION COVER

4TH EAST ROAD - COTTONWOOD/WILBERG

Vegetative Cover		47.0%
Undesirables		7.2%
KOSP	0.8%	
SAKA	6.4%	
Desirables		39.8%
AGSMS	30.8%	
ORHYH	3.2%	
MEOF	5.0%	
ELSA	0.8%	
Litter		34.6%
Rock		15.0%
Bare Ground		3.4%
TOTAL		100.0%

Vegetation Field Notes

Company Name Utah Power & Light Date 10/23/87

Location 4th E. Access Site Rd - Wilberg Time 11:11

Magnetic Heading 150° SE Transect # 1

Species vigor and/or % cover.

R	L	agra 1	T	agra [illegible]	L	agra	T	L	R
L	R	L	ne R	ne R	L	L	ne T	T	B
grass 1	L	L	L	L	L	B	agra	L	L
B	R	L	B	L	L	L	L	L	clover agra
agra	R	R	clover	L	L	L	R	R	agra 1
L	L	L	agra	Clover	L	L	agra	L	wes agra
agra	clover	agra	R	Thus	agra 1	R	Clover	agra	agra 1
a L	agra 1	L	L	agra	Thus	agra	agra	agra	Thus
L	agra	agra	agra	agra	L	agra 1	L	agra	Ing Rice Grass 3
grass 1	agra	agra	L	grass 1	grass	L	agra	agra	Litter
L	clover	agra	Thus	Ind Rice	R	Ind R	agra	Ind R	Litter
L	R	agra	L	agra	agra Ind Rice	L	L	L	agra
L	agra	L	Thus	L	L	L	agra	agra	Grass 1 Bacon L
clover	agra	clover	L	L	R	agra	agra	L	L
agra	L	Ind R	R	L	L	IR	agra	agra	Thus
L	L	Thus	Kochia	Thus	L	R	Thus	agra	agra

Comments & Observations Brossing on clover, occular - 65%

1987 VEGETATION SURVEY

UTAH POWER AND LIGHT COMPANY

WASTE ROCK SITES

COTTONWOOD/WILBERG

WASTE ROCK SITES - COTTONWOOD/WILBERG

INTERIM RECLAMATION SURVEY

General Background:

The Waste Rock reclamation area is located on Grimes Wash, a tributary to Cottonwood Creek. The survey site lies approximately 6 miles northwest of Orangeville, Utah [see Location Map - Figure 1]. Reclamation on the Waste Rock site was divided into 8 properties. The acreage for each property is as follows:

Property	Acreage
Cell #1	1.0
Berm #1	0.2
Cell #2	1.0
Berm #2	0.6
Cell #3	2.0
Berm #3	0.5
Cell #4	2.0
Berm #4	1.4

The elevation of the properties range from 6710' to an elevation of 6800'.

Planting Methodologies:

The Waste Rock properties were reclaimed over a four-year span in the following sequence: cell #1 and berm #1, 1983; cell #2 and berm #2, 1984; cell #3 and berm #3, 1985, and cell #4 and berm #4, 1986.

The seed mixture was broadcast at a predetermined rate using hurricane spreaders. The fertilizer mixture contained 50 pounds per acre ammonium nitrate and 75 pounds per acre triple superphosphate and was applied as a separate application. The slopes were then raked to turn the soil surface and covered with a $\frac{1}{2}$" layer of chopped alfalfa hay mulch [2 tons per acre].

Conclusions and Recommendations:

Cell #1 - Survey of cell #1 was completed on October 3, 1987. The overall appearance of the entire site is fair, plant vigor is good. The majority of the vegetation cover consisted of desirable species which appeared to be well established. No adverse impacts from grazing, insects or rodents is evident. Grazing pressure may have been a negative impact as shown by the better vegetation in some areas, however, entire periphery of area is fenced. No signs of erosion are apparent.

It appears at this time the only recommendations which the survey data indicates is to continue to monitor the area for further vegeta-a tion establishment.

Survey results, species list, example of field notes are included as Attachment 12.

Berm #1 - Survey of Berm #1 was completed October 3, 1987. The overall appearance of the site is poor with the majority of the vegetative cover consisting of undesirable species. Plant vigor is marginal. No adverse impacts from grazing, insects and rodents is evident. The resulting condition of the reclaimed berm may be indicative of poor soil conditions or the inability of the berm site to accumulate water. No signs of erosion are apparent.

It appears at this time the only recommendation which the survey data indicates is to continue to monitor the area for further vegetation establishment.

Survey results, species list, and example of field notes are included as Attachment 13.

Cell #2 - Survey of Cell #2 was completed October 3, 1987. The overall appearance of the site is good, with plant vigor fair. Although the majority of the plant cover consists of undesirable species, there is almost an equal representation of desirable plants. Total vegetative cover well exceeds bare ground. No adverse impacts from grazing, insects and rodents is evident. No problems with erosion is present.

The only recommendation is to continue monitoring the area for further establishment of desirable plant species.

Survey results, species list and example of field notes are included as Attachment 14.

Berm #2 - Survey of Berm #2 was completed October 3, 1987. The overall appearance of the site is excellent with the majority of the plant cover consisting of desirable species. Plant vigor is good. Evidence of use includes domestic cattle and rabbits, however, adverse impacts from such use is not indicated. No problems with erosion are present.

The only recommendation that the survey data indicates is to continue monitoring the site for further vegetation establishment.

Survey results, species list, example of field notes are included as Attachment 15.

Cell #3 - Survey of Cell #3 was completed October 3, 1987. The overall appearance of the site is poor with the majority of the plant cover consisting of undesirable species. Plant vigor is marginal. The predominance of undesirable species may be the result of early succession and the invasive nature of many weed-type plant. Use of the area by rabbits is evident. No adverse impacts from grazing, insects or rodents is present. No signs of erosion are present.

The survey data supports the recommendation for continued monitoring of the site for further vegetation establishment.

Survey results, species list, example of field notes are included as Attachment 16.

Berm #3 - Survey of Berm #3 was completed on October 3, 1987. The overall appearance of the entire site is poor with the majority of the vegetative cover consisting of undesirable plant species. Plant vigor is marginal. No adverse impacts from grazing, insects and rodents is evident. The resulting condition of the reclaimed berm may be indicative of poor soil conditions or the inability of the berm to accumulate water. Signs of erosion are not apparent.

The only recommendation which the survey data indicates is to continue to monitor the area for further vegetation establishment.

Survey results, species list and example of field notes are included as Attachment 17

Cell #4 - Survey of Cell #4 was completed on October 3, 1987. The overall appearance of the entire site is poor with the majority of the vegetative cover consisting of undesirable plant species. Plant vigor is marginal. The predominance of undesirable plants may be the result of poor soil conditions or the invasive nature of certain weed-type plants following ground disturbance. Abundant use of the area by rabbits is evident, however, no adverse impacts from grazing, insects or rodents is evident. No signs of erosion are present.

The only recommendation at this time is to continue monitoring the

area for further vegetation establishment.

Survey results, species list and examples of field notes are included as Attachment 18.

Berm #4 - Survey of Berm #4 was completed on October 3, 1987. The overall appearance of the entire site is excellent with the majority of the plant cover consisting of desirable species. Plant vigor is good. Abundant use by rabbits was evident, however, no edverse impacts from grazing, insects and rodents is apparent. Signs of erosion were not evident.

The only recommendation which the survey data indicates is to continue to monitor the area for further vegetation establishment.

Survey results, species list and example of field notes are included as Attachment 19.

ATTACHMENT 12

SEED MIXTURE

COTTONWOOD/WILBERG, DES-BEE-DOVE

WASTE ROCK SITE - CELL #1

SCIENTIFIC NAME	COMMON NAME
Agropyron crestatum	Crested wheatgrass
Agropyron intermedium	Intermediate wheat
Oryzopsis hymenoides	Indian rice grass
Atriplex cuneatus	4-wing salt brush
Atriplex confertifolia	Shadscale
Ephedra	Ephedra [green]

VEGETATIVE COVER

WASTE ROCK CELL #1

Vegetative Cover		18.6%
Undesirables		4.4%
	HAGL	0.6%
	SAKA	3.8%
Desirables		14.2%
	AGCR	9.4%
	DAGL	0.6%
	AGIN	1.6%
	SIHY	1.0%
	ORHYH	0.2%
	MEOF	0.2%
	ATCU	1.2%
Litter		6.4%
Rock		6.0%
Bare Ground		69.0%
	TOTAL	100.0%

SPECIES LIST

WASTE ROCK - CELL #1

SYMBOL	SCIENTIFIC NAME	COMMON NAME
AGCR	Agropyron crestatum	Crested wheatgrass
DAGL	Dactylis glomerata	Orchardgrass
AGIN	Agropyron intermedium	Intermediate wheatgrass
SIHY	Sitanion hystrix	Squirreltail grass
ORHYH	Oryzopsis hymenoides	Indian ricegrass
SAKA	Salsola kali	Russian thistle
HAGL	Halobeton glomerata	Halogeton
MEOF	Melilotus officinalis	Yellow sweetclover
ATCU	Atriplex cuneata	Cuneate saltbush

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t-Test at 90% Confidence Level

$$n = \frac{[t]^2\,[s]^2}{[10\%\ \text{mean}]^2}$$

t = 1 tail at 90% confidence is 1.299 with df = 49 [50-1]

Variance = standard deviation squared $[s]^2 = 3.48$

Sample mean $[\bar{x}] = 3.48$

Sample size [n] = 50

Sample size needed for a 90% confidence=

$$n = \frac{[1.299]^2\,[3.48]}{.148} = 39.7$$

should be at below 50

Vegetation Field Notes

Company Name UP&L Date 10/3

Location Cottonwood/Wilbur Site Waste Rock #1 Time

Magnetic Heading 320 NW Transect #

Species vigor and/or % cover. 1 of 3

AGCR	B	B	B	B	B	AGCR	B	B	AGCR
B	B	AGCR	B	B	AGCR	AGCR	B	B	B
AGCR	AGCR	AGCR	AGCR	AGCR	AGCR	B	B	AGCR	AGCR
B	B	AGCR	B	B	AGCR	B	AGCR	AGCR	AGCR
B	B	B	AGCR	AGCR	AGCR	AGCR	B	AGCR	B
B	B	B	AGCR	B	B	AGCR	AGCR	B	AGCR
B	B	B	B	AGCR	B	B	B	B	B
B	B	B	B	B	B	R	B	HAGL	B
R	AGSMS	B	B	B	B	R	B	AGCR	B
AGCR	AGCR	B	B	AGCR	AGCR	B	B	AGCR	B
B	B	AGCR	B	AGCR	B	R	B	AGCR	AGCR
B	B	B	B	B	B	B	B	B	AGCR
AGCR	B	B	AGCR	B	B	DAGL	R	B	B
DAGL	B	B	R	AGCR	DAGL	R	R	R	B
B	B	AGCR	B	B	B	B	B	B	R
R	AGCR	R	B	AGCR	R	B	B	B	B
B	B	AGIN	AGCR	AGCR	B	MEOF	AGIN	ATCU	B
B	B	B	R	AGCR	B	R	AGIN	B	B
AGSMS	B	B	ATCU	AGIN	B	R	B	B	B
AGCR	AGCR	AGCR	B	B	B	B	AGCR	R	B

Comments & Observations AGCR ATCU Layer of [illegible]
ORHY POPR Not abundant
HAGL

Heather Weiker

Vegetation Field Notes

Company Name UP&L Date 10/3

Location Cottonwood/Willow Site Warrior Rock #1 Time

Magnetic Heading Transect #

Species vigor and/or % cover. 2 of 3

B	B	L	AGCR	ATCU	AGCR	AGCR	AGCR	AGCR	AGCR
B	AGCR	B	B	AKA	AGCR	AGCR	L	AGCR	B
AGCR	B	B	AGCR	B	AGCR	AGCR	B	B	B
AGCR	AGCR	B	AGCR	B	B	B	AGCR	AGCR	AGCR
B	B	B	B	B	B	B	AGCR	B	B
AGCR	B	B	B	R	B	B	B	B	B
L	L	B	B	AGCR	AGCR	AGCR	B	B	B
L	R	L	B	B	B	SIHY	L	SIHY	B
AGCR	L	L	B	AGCR	AGCR	AGCR	ATCU	R	L
L	B	L	L	AGCR	AGCR	R	ATCU	SIHY	B
L	L	L	L	L	B	L	AGCR	L	R
AGCR	R	AGCR	AGCR	L	B	AGCR	R	AGCR	AGCR
AGCR	B	AGCR	R	AGCR	B	AGCR	B	B	B
AGCR	AGCR	B	AGCR	B	B	AGCR	AGCR	AGCR	R
R	B	AGIN	AGCR	AGCR	B	AGCR	AGCR	R	B
AGCR	AGCR	B	AGCR	AGCR	B	B	B	AGCR	B
B	HAGL	B	B	B	AGCR	AGCR	B	AGCR	AGCR
AGCR	AGCR	B	L	B	B	B	B	AGCR	B
HAGL	B	L	B	B	B	B	B	AGCR	AGCR
B	R	AGCR	L	L	B	L	B	B	R

Comments & Observations SIHY

Vegetation Field Notes

Company Name UPSL Date 10/3/87

Location Cottonwood/Wilbur Site WASH Rock #1 Time

Magnetic Heading Transect #

Species vigor and/or % cover. 3 of 3

B	AGCR	B	L	B	AGCR	ATCU	B	B	AGCR
AGCR	AGCR	AGCR	AGCR	AGCR	AGCR	B	B	AGCR	B
B	B	AGCR	B	AGCR	AGCR	AGCR	AGCR	B	B
AGCR	AGCR	B	B	ORHY	AGCR	B	B	B	AGCR
B	SAKA	B	B	B	AGCR	B	AGCR	AGCR	B
L	SAKA	B	L	B	B	B	AGCR	B	B
SAKA	R	B	SAKA	SAKA	SAKA	SAKA	B	SAKA	SAKA
R	SAKA	SAKA	SIHY	B	R	B	SAKA	SAKA	L
SAKA	SAKA	AGCR	R	R	R	L	SAKA	SIHY	L
AGCR	B	SAKA	AGCR	AGCR	B	SAKA	B	B	B

Comments & Observations ARTR

ATTACHMENT 13

SEED MIXTURE

COTTONWOOD/WILBERG, DES-BEE-DOVE

WASTE ROCK SITE - BERM #1

SCIENTIFIC NAME	COMMON NAME
Agropyron crestatum	Crested wheatgrass
Agropyron intermedium	Intermediate wheat
Oryzopsis hymenoides	Indian rice grass
Atriplex cuneatus	4-wing salt brush
Atriplex confertifolia	Shadscale
Ephedra	Ephedra [green]

SPECIES LIST

WASTE ROCK BERM #1

SYMBOL	SCIENTIFIC NAME	COMMON NAME
AGCR	Agropyron crestatum	Crested wheatgrass
ORHYH	Oryzopsis hymenoides	Indian rece grass
MEOF	Melilotos officinalis	Yellow sweetclover
SAKA	Salsola kali	Russian thistle
BRASS[2]	Brassica sp.	Mustard

t-Test at 90% Confidence Level

$$n = \frac{[t]^2\ [s]^2}{[10\%\ \text{mean}]^2}$$

t = 1 tail at 90% confidence is 1.299 with df = 49 [50-1]

Variance = standard deviation squared $[s^2]$ = 2.83

Sample mean $[\bar{x}]$ = 4.77

Sample size [n] = 50

Sample size needed for a 90% confidence

$$n = \frac{[1.299]^2\ [2.83]}{.228} = 20.85$$

should be at or below 50

VEGETATIVE COVER

WASTE ROCK BERM # 1

Vegetative Cover		47.8%
Undesirables		47.2%
HAGL	0.2%	
SAKA	47.0%	
Desirables		0.6%
ORHYH	0.2%	
AGCR	0.4%	
Litter		6.6%
Rock		4.6%
Bare Ground		41.0%
TOTAL		100.0%

Vegetation Field Notes

Company Name UP & L Date 10/3/87

Location Wilberg/Cottonwood Site White Rock Berm #1 Time

Magnetic Heading Transect #

Species vigor and/or % cover.

POFR = ORHU

SAKA	SAKA	SAKA	SAKA	SAKA	SAKA	SAKA	B	B	B
ORHU	L	L	L	SAKA	B	B	B	SAKA	SAKA
B	SAKA	SAKA	SAKA	B	B	SAKA	SAKA	L	SAKA
SAKA	SAKA	SAKA	SAKA	SAKA	SAKA	SAKA	SAKA	SAKA	B
SAKA	SAKA	SAKA	B	SAKA	B	B	B	B	SAKA
SAKA	SAKA	B	B	B	SAKA	B	B	SAKA	SAKA
SAKA	SAKA	SAKA	SAKA	SAKA	B	SAKA	B	SAKA	SAKA
SAKA	B	SAKA	SAKA	B	SAKA	B	B	B	SAKA
SAKA	SAKA	SAKA	SAKA	SAKA	B	SAKA	SAKA	SAKA	B
SAKA	SAKA	SAKA	R	B	L	SAKA	SAKA	R	B
SAKA	SAKA	SAKA	SAKA	SAKA	SAKA	SAKA	SAKA	SAKA	SAKA
B	B	R	SAKA	B	B	B	B	B	SAKA
B	SAKA	R	R	R	SAKA	R	L	L	SAKA
L	L	SAKA	B	SAKA	R	SAKA	SAKA	R	B
B	SAKA	SAKA	B	B	B	SAKA	SAKA	SAKA	SAKA
SAKA	L	L	L	L	R	L	R	SAKA	L
B	SAKA	SAKA	SAKA	L	R	B	B	R	SAKA
B	SAKA	SAKA	R	L	B	SAKA	SAKA	B	L
R	R	SAKA	L	L	SAKA	SAKA	SAKA	SAKA	R
B	SAKA	L	L	B	B	SAKA	SAKA	L	L

Comments & Observations [illegible] ORHU

MEOF AGICK

SAKA

Heather Welker

Vegetation Field Notes

Company Name C&P&L Date 10/3/87

Location Wilbur/Cottonwood Site White Rock Berm #1 Time

Magnetic Heading Transect #

Species vigor and/or % cover. 2 of 3

B	SAKA	SAKA	B	SAKA	SAKA	SAKA	SAKA	SAKA	B
B	L	SAKA	SAKA	B	B	SAKA	SAKA	B	SAKA
SAKA	SAKA	SAKA	SAKA	HASL	SAKA	SAKA	SAKA	B	SAKA
B	SAKA	SAKA	SAKA	B	L	R	SAKA	SAKA	SAKA
SAKA	SAKA	SAKA	SAKA	E	SAKA	SAKA	SAKA	SAKA	SAKA
AGCR	B	L	SAKA	SAKA	SAKA	R	SAKA	SAKA	B
SAKA	B	SAKA	B	SAKA	SAKA	L	SAKA	SAKA	B
SAKA	SAKA	SAKA	SAKA	B	SAKA	B	B	SAKA	SAKA
B	SAKA	B	B	B	SAKA	SAKA	SAKA	SAKA	B
B	B	B	B	B	B	SAKA	B	SAKA	B
SAKA	B	B	SAKA	R	SAKA	B	B	R	B
B	R	B	SAKA	SAKA	SAKA	SAKA	B	L	SAKA
B	B	B	B	B	B	B	B	B	B
B	SAKA	SAKA	B	B	R	B	B	B	SAKA
B	B	B	B	SAKA	SAKA	B	B	B	B
SAKA	SAKA	B	B	B	B	B	B	B	B
B	B	SAKA	L	B	SAKA	SAKA	B	B	SAKA
SAKA	B	L	B	B	SAKA	B	SAKA	SAKA	B
B	B	B	SAKA	B	L	SAKA	B	SAKA	B
SAKA	B	AGCR	R	B	SAKA	SAKA	B	SAKA	B

Comments & Observations

Vegetation Field Notes

Company Name UP&L **Date** 10/3/87

Location Cottonwood/Wilberg **Site** Wanty Fork Basin #1 **Time** _____

Magnetic Heading _____ **Transect #** _____

Species vigor and/or % cover. 3 of 3

B	SAKA	L	SAKA	B	SAKA	SAKA	SAKA	B	SAKA
SAKA	SAKA	SAKA	B	B	SAKA	B	B	SAKA	SAKA
SAKA	B	SAKA	SAKA	SAKA	B	SAKA	B	SAKA	SAKA
SAKA	SAKA	B	SAKA	B	B	B	B	B	SAKA
B	B	SAKA	SAKA	B	B	B	B	SAKA	SAKA
SAKA	B	B	B	B	B	B	B	B	B
SAKA	SAKA	B	SAKA	SAKA	B	B	B	B	B
SAKA	SAKA	SAKA	B	B	B	B	B	B	SAKA
SAKA	B	SAKA	B	B	B	B	B	SAKA	B
SAKA	B	B	B	SAKA	B	B	B	B	SAKA

Comments & Observations _____

ATTACHMENT 14

SEED MIXTURE

FOR CELL #2

SCIENTIFIC NAME	COMMON NAME
Agropyron crestatum	Crested wheatgrass
Oryzopsis hymenoides	Indian ricegrass
Stipa comata	Needle & thread grass
Agropyron smithii	Western wheatgrass
Halaria sp.	Galleta grass
Melilotus officinalis	Yellow sweetclover
Sphairalcea coccinea	Scarlet globemallow
Artemesia tridentata	Mt. big sagebrush
Atriplex canescens	4-wing saltbrush
Ephedra viridis	Green ephedra
Cercocarpus montanus	Birchleaf mahogany

SPECIES LIST

WASTE ROCK CELL #2

SYMBOL	SCIENTIFIC NAME	COMMON NAME
DAGL	Dactylis glomerata	Orchardgrass
SIHY	Sitanion hystrix	Squirreltail grass
AGCR	Agropyron cristatum	Crested wheatgrass
ORHYH	Oryzopsis hymenoides	Indian ricegrass
SAKA	Salsola kali	Russian thistle
ATCU	Atriplex cuneatus	4-wing saltbush

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t-Test at 90% Confidence Level

$$n = \frac{[t]^2\ [s]^2}{[10\%\ \text{mean}]^2}$$

t = 1 tail at 90% confidence is 1.299 with df = 49 [50-1]

Variance = standard deviation squared $[s^2]$ = 6.32

Sample mean $[\bar{x}]$ = 5.14

Sample size [n] = 50

Sample size needed for a 90% confidence

$$n = \frac{[1.299]^2\ [6.32]}{.264} = 40.4$$

Should be at or below 50

VEGETATIVE COVER

WASTE ROCK CELL #2

Vegetative Cover		51.0%
Undesirable		26.2%
	SAKA	26.2%
Desirables		24.8%
	DAGL	2.2%
	SIHY	14.2%
	AGCR	3.8%
	ORHYH	0.6%
	ATCU	2.0%
	AGIN	2.0%
Litter		10.0%
Rock		0.8%
Bare Ground		38.2%
	TOTAL	100.0%

Vegetation Field Notes

Company Name UP&L Date 10/3

Location Cottonwood/Wilbur Site Waste Rock #2 Time

Magnetic Heading Transect #

Species vigor and/or % cover. 1 of 3

SAKA		B		B		B		B		SAKA		SAKA		B		SAKA		SAKA	
B		B		B		SAKA		B		SAKA		SAKA		B		ATCU		B	
B		SAKA		B		SAKA		B		SAKA		SAKA		ATCU		B		B	
B		B		SAKA		B		B		B		B		B		B		L	
SAKA		SAKA		SAKA		B		B		B		SAKA		B		B		SAKA	
B		SAKA		SAKA		SAKA		B		B		SAKA		SAKA		SAKA		B	
B		B		B		SAKA		SAKA		B		B		B		B		SAKA	
SAKA		SAKA		B		SAKA		SAKA		SAKA		SAKA		SAKA		SAKA		SAKA	
B		SAKA		DAGL		L		L		L		SAKA		B		B		SIHY	
B		SAKA		B		B		DAGL		SAKA		SAKA		SAKA		SAKA		B	
SAKA		SAKA		ATCU		B		B		L		L		DAGL		SAKA		L	
SAKA		SAKA		SAKA		SAKA		SIHY		SIHY		B		SAKA		SAKA		L	
B		SAKA		SAKA		B		SAKA		B		SAKA		SAKA		SAKA		B	
SAKA		SAKA		SAKA		B		SAKA		SAKA		SAKA		SAKA		B		SAKA	
DAGL		B		SAKA		SAKA		SAKA		SAKA		SAKA		SIHY		B		SAKA	
SIHY		B		SIHY		SIHY		SIHY		SIHY		SIHY		SIHY		B		SIHY	
SIHY		SIHY		SIHY		SIHY		B		SIHY		SIHY		SIHY		SIHY		SIHY	
SIHY		SIHY		SIHY		SIHY		SIHY		SIHY		SIHY		SIHY		SIHY		SIHY	
[illegible]		SIHY		SIHY		SIHY		[illegible]		[illegible]		SIHY		SIHY		B		SIHY	
SIHY		SIHY		B		[illegible]		[illegible]		SIHY		SIHY		ATCU		L		L	

Comments & Observations [illegible] Lagoon [illegible] abundant

ATCU

DAGL

Heather Weeker

Vegetation Field Notes

Company Name UP&L Date 10/3/87

Location Cottonwood/Willows Site Wick Rock #2 Time

Magnetic Heading Transect #

Species vigor and/or % cover. 2063

B	B	B	SAKA	L	L	L	L	SIHY	L
L	L	SAKA	B	L	SIHY	SIHY	SIHY	B	L
SIHY	SAKA	DAGL	L	B	B	B	B	SIHY	B
B	B	B	B	B	AGCR	AGCR	AGCR	B	B
SIHY	SIHY	SIHY	B	L	SIHY	B	B	B	SIHY
DAGL	SIHY	SIHY	L	B	B	B	B	SIHY	ATCU
SAKA	SAKA	SAKA	SIHY	DAGL	SAKA	SAKA	SAKA	SAKA	B
SAKA	SAKA	SAKA	DAGL	R	SIHY	SIHY	SIHY	SAKA	B
SAKA	SAKA	SAKA	DAGL	SAKA	SAKA	DAGL	SIHY	B	SAKA
SAKA	B	SAKA	B	ATCU	B	SAKA	SAKA	SAKA	B
B	DAGL	L	SAKA	B	SIHY	SAKA	SAKA	SAKA	SIHY
SAKA	SAKA	SAKA	SAKA	SAKA	SAKA	SAKA	SAKA	SAKA	SAKA
B	AGCR	B	B	B	SIHY	R	SAKA	SAKA	L
AGCR	AGCR	L	L	SAKA	SAKA	SAKA	L	B	SAKA
L	L	B	AGCR	B	L	L	L	B	L
B	SAKA	B	SAKA	B	B	B	B	SAKA	SAKA
AGIN	SIHY	B	B	B	R	L	B	AGIN	B
AGIN	B	B	B	B	B	B	SAKA	B	SAKA
B	B	SAKA	L	B	B	B	SAKA	B	AGCR
SAKA	B	SAKA	L	B	AGIN	L	AGCR	B	B

Comments & Observations AGSMS

Vegetation Field Notes

Company Name UP&L Date 10/3/87

Location Cottonwood/Willow Site Nasti Rock #2 Time

Magnetic Heading Transect #

Species vigor and/or % cover. 3063

B	B	SAKA	B	SAKA	SAKA	B	SIHY	SAKA	AGIN
B	B	B	B	B	B	B	B	AGIN	B
AGIN	B	AGIN	L	B	ATCU	ATCU	AGCR	SIHY	B
L	L	B	B	AGCR	AGCR	SIHY	SIHY	B	SIHY
AGIN	B	AGIN	L	L	B	SIHY	L	B	L
B	B	B	B	B	B	AGINS	B	B	AGCR
L	B	B	B	B	B	R	B	B	B
B	ORHYH	AGCR	ORHYH	ATCU	B	AGCR	B	AGCR	B
B	B	B	B	ATCU	B	B	AGCR	B	B
B	AGCR	L	B	B	L	B	AGCR	L	ORHYH

Comments & Observations Some lagoon spot present
Some grasses grazed in spots

ATTACHMENT 15

SEED MIXTURE

FOR BERM #2

SCIENTIFIC NAME	COMMON NAME
Agropyron crestatum	Crested wheatgrass
Oryzopsis hymenoides	Indian ricegrass
Stipa comata	Needle & thread grass
Agropyron smithii	Western wheatgrass
Halaria sp.	Galleta grass
Melilotus officinalis	Yellow sweetclover
Sphairalcea coccinea	Scarlet globemallow
Artemesia tridentata	Mt. big sagebrush
Atriplex canescens	4-wing saltbrush
Ephedra viridis	Green ephedra
Cercocarpus montanus	Birchleaf mahogany

SPECIES LIST

WASTE ROCK BERM #2

SYMBOL	SCIENTIFIC NAME	COMMOM NAME
AGCR	Agropyron crestatum	Crested wheatgrass
AGIN	Agropyron intermedium	Intermediate wheatgrass
ORHYH	Oryzopsis hymenoides	Indian ricegrass
SAKA	Salsoa kali	Russian thistle
ATCU	Atriplex cuneatus	4-wing saltbush
ATCO	Atriplex confertifolia	Shadscale

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t-Test at 90% Confidence Level

$$n = \frac{[t]^2\ [s]^2}{[10\%\ \text{mean}]}$$

t = 1 tail at 90% confidence is 1.299 with df = 49 [50-1]

Variance = standard deviation squared $[s^2]$ = 3.18

Sample mean $[\bar{x}]$ = 4.72

Sample size [n] = 50

Sample size needed for a 90% confidence =

$$n = \frac{[1.299]^2\ [3.18]}{.223} = 2.41$$

should be at or below 50

VEGETATIVE COVER

WASTE ROCK BERM #2

Vegetative Cover		39.6%
Undesirables		0.4%
	SAKA	0.4%
Desirables		39.2%
	AGCR	26.4%
	AGIN	0.4%
	ATCU	11.2%
	ATCO	1.0%
	ORHYH	0.2%
Litter		6.4%
Rock		7.0%
Bare Ground		47.0%
	TOTAL	100.0%

Vegetation Field Notes

Company Name UP&L **Date** 10/3/87

Location Cottonwood Wilcox **Site** Waste Pond Berm #2 **Time** _____

Magnetic Heading 280° W **Transect #** _____

Species vigor and/or % cover.

AGCR	AGCR	AGCR	B	B	ATCU	B	B	AGCR	AGCR
AGCR	AGCR	B	B	AGCR	ATCU	AGCR	AGCR	AGCR	B
B	B	B	R	R	AGCR	AGCR	B	B	AGCR
R	R	AGCR	AGCR	R	R	AGCR	AGCR	AGCR	B
AGCR	B	B	ORWM	B	B	B	B	AGCR	B
ATCU	ATCO	B	AGCR	ATCU	AGCR	AGCR	AGCR	AGCR	B
B	B	B	B	ATCU	B	AGCR	B	B	ATCU
B	AGCR	ATCU	B	B	ATCU	ATCU	B	B	AGCR
B	B	B	ATCU	R	B	B	AGCR	AGCR	AGCR
AGCR	B	B	B	B	B	B	AGCR	ATCU	AGCR
ATCU	AGCR	B	R	B	B	B	AGCR	B	B
ATCU	B	B	B	B	R	AGCR	B	AGCR	B
AGCR	AGCR	AGCR	B	R	R	R	R	AGCR	R
AGCR	AGCR	ATCO	AGCR	AGCR	R	AGCR	AGCR	B	L
B	AGCR	B	AGCR	B	ATCU	R	B	AGCR	AGCR
B	AGCR	AGCR	B	B	AGCR	AGCR	B	B	AGCR
AGCR	L	B	ATCU	B	R	ATCU	B	B	B
B	B	B	AGCR	B	B	AGCR	B	B	B
AGCR	B	B	ATCU	B	B	B	B	L	B
B	B	B	B	B	B	B	B	AGCR	AGCR

Comments & Observations ATCO
Cow Scat present
Lagomorph Scat also present

Heather Weeker

Vegetation Field Notes

Company Name UP & L **Date** 10/3 '82

Location Cottonwood/Wilbur **Site** Waste Rock Berm #2 **Time** _____

Magnetic Heading _____ **Transect #** _____

Species vigor and/or % cover. 2 of 3

AGCR	AGCR	B	AGCR	B	B	B	AGCR	B	B
B	B	R	AGCR	L	B	R	B	B	ATCU
L	AGCR	B	ATCU	ATCU	AGCR	AGCR	R	L	ATCU
B	L	R	AGCR	AGCR	AGCR	B	AGCR	B	B
ATCU	ATCU	AGCR	AGCR	B	L	L	ATCU	AGCR	B
AGCR	ATCU	ATCO	AGCR	B	B	ATCU	AGCR	AGCR	B
AGCR	L	B	B	B	AGCR	ATCU	L	B	AGCR
B	ATCU	R	B	AGCR	AGCR	AGCR	ATCU	R	AGCR
L	B	AGCR	B	AGCR	B	B	ATCU	L	AGCR
AGCR	B	AGCR	AGCR	R	B	B	B	AGCR	B
L	B	ATCU	AGCR	L	AGCR	AGCR	B	B	AGCR
R	AGCR	ATCU	B	R	R	AGCR	R	AGCR	AGCR
B	R	AGCR	AGCR	B	B	B	B	AGCR	L
ATCU	B	AGCR	AGCR	R	ATCU	B	AGCR	R	AGCR
R	B	AGCR	AGCR	AGCR	AGIN	AGIN	B	AGCR	L
AGCR	R	ATCU	R	B	B	L	ATCU	AGCR	ATCU
R	B	ATCU	ATCU	L	B	B	B	ATCU	L
R	R	R	B	AGCR	B	B	B	L	B
AGCR	AGCR	ATCU	AGCR	AGCR	B	AGCR	AGCR	L	AGCR
B	AGCR	AGCR	AGCR	B	R	AGCR	L	ATCO	AGCR

Comments & Observations _____

Vegetation Field Notes

Company Name UP&L **Date** 10/3

Location Cottonwood/Willow **Site** White Rock Basin #2 **Time** _____

Magnetic Heading _____ **Transect #** _____

Species vigor and/or % cover. 3 of 3

AGCR	L	L	L	AGCR	B	ATCU	B	AGCR	B	
AGCR	AGCR	B	B	B	L	B	B	B	B	
R	B	L	ATCU	R	B	ATCU	AGCR	AGCR	AGCR	
AGCR	ATCU	ATCU	ATCU	ATCU	E	B	B	AGCR	AGCR	
ATCU	ATCU	ATCU	ATCU	AGCR	AGCR	R	AGCR	L	ATCU	
AGCR	B	ATCU	L	L	ATCU	B	AGCR	AGCR	R	
AGCR	AGCR	R	AGCR	AGCR	B	SAGA	B	SAGA	B	
AGCR	AGCR	AGCR	ATCU	L	B	AGCR	AGCR	B	AGCR	
AGCR	AGCR	AGCR	AGCR	AGCR	AGCR	B	B	R	B	
AGCR	AGCR	ATCU	B	AGCR	B	AGCR	ATCU	B	B	

Comments & Observations _____

ATTACHMENT 16

SEED MIXTURE

CELL #3

SCIENTIFIC NAME	COMMON NAME
Agropyron crestatum	Crested wheatgrass
Oryzopsis hymenoides	Indian ricegrass
Stipa comata	Needle & thread grass
Agropyron smithii	Western wheatgrass
Halaria sp.	Galleta grass
Melilotus officinalis	Yellow sweetclover
Sphairalcea coccinea	Scarlet globemallow
Artemesia tridentata	Mt. big sagebrush
Atriplex canescens	4-wing saltbrush
Ephedra viridis	Green ephedra
Cercocarpus montanus	Birchleaf mahogany

SPECIES LIST

WASTE ROCK CELL #3

SYMBOL	SCIENTIFIC NAME	COMMON NAME
SIHY	Sitanion hystrix	Squirreltail grass
AGROP	AGropyron sp.	Wheatgrass
DAGL	Dactylis glomerata	Orchardgrass
ORHYH	Oryzopsis hymenoides	Indian ricegrass
BRMA	Bromus marginatus	Mountain brome
AGIN	Agropyron Intermedium	Intermediate wheatgrass
AGCR	Agropyron cristatum	Crested wheatgrass
SAKA	Salsola kali	Russian thistle
HAGL	Halogeton glomerata	Halogeton
ATCU	Atriplex cuneatus	4-wing saltbush

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t-Test at 90% Confidence Level

$$n = \frac{[t]^2\ [s]^2}{[10\%\ \text{mean}]^2}$$

t = 1 tail at 90% confidence is 1.299 with df = 49 [50-1]

Variance = standard deviation squared $[s^2]$ = 3.02

Sample mean $[\bar{x}]$ = 6.72

Sample size [n] = 50

Sample size needed for a 90% confidence

$$n = \frac{[1.299]^2\ [\ 3.02\ ]}{.452} = 11.3$$

should be at or below 50

VEGETATION COVER

WASTE ROCK CELL #3

Vegetative Cover	67.0%
Undesirables	55.0%
SAKA	54.2%
HAGL	0.8%
Desirables	12.0%
SIHY	0.8%
AGROP	1.8%
DAGL	5.6%
ORHYH	1.6%
BRMA	0.2%
AGIN	0.2%
AGCR	0.2%
ATCU	1.6%
Litter	4.0%
Rock	1.0%
Bare Ground	28.0%
TOTAL	100.0%

Vegetation Field Notes

Company Name UP&L Date 10/3/87

Location Cottonwood/Wilburg Whistle Rock Site Cell #3 Time 0935

Magnetic Heading 90°E Transect # 1

Species vigor and/or % cover. 1 of 3

SAKA	SAKA	AGROP	[illegible]	SAKA	L	DAGL	L	SIHY	DAGL
SIHY	L	SAKA	DAGL	DAGL	SAKA	L	L	L	SAKA
B	SAKA	B	R	B	B	B	B	SAKA	B
SAKA	B	SAKA	B	B	SAKA	B	B	B	ATCU
SAKA	B	B	SAKA	AGROP	B	DAGL	SAKA	B	SAKA
B	SAKA	SAKA	AGROP	SAKA	B	SAKA	B	B	DAGL
SAKA	B	AGROP	B	B	SAKA	SAKA	SAKA	SAKA	SAKA
SAKA	HAGL	SAKA	B	B	SAKA	SAKA	B	B	SAKA
B	SAKA	B	HAGL	SAKA	B	B	B	HAGL	SAKA
SAKA	B	AGCR	SAKA	SAKA	HAGL	SAKA	SAKA	SAKA	SAKA
SAKA	SAKA	SIHY	SAKA	SAKA	B	L	SAKA	SAKA	DAGL
SAKA	SAKA	SAKA	SAKA	SAKA	B	SAKA	B	SAKA	SAKA
SIHY	B	SAKA	SAKA	ATCU	SAKA	SAKA	SAKA	B	SAKA
ATCU	SAKA	SAKA	AGROP	B	SAKA	B	SAKA	B	B
SAKA	SAKA	SAKA	SAKA	SAKA	SAKA	SAKA	SAKA	B	SAKA
SAKA	B	SAKA	L	B	B	B	SAKA	SAKA	B
SAKA	SAKA	SAKA	SAKA	B	B	B	B	B	B
SAKA	B	SAKA	B	B	SAKA	B	SAKA	SAKA	B
SAKA	SAKA	B	L	L	SAKA	SAKA	SAKA	SAKA	B
B	SAKA	SAKA	B	B	BRMA	SAKA	B	SAKA	B

20

Comments & Observations TR: Dactylus DAGL Tribens / Danthonia 5 avg.

SIHY ATCU AGROP Brome

SAKA ORHY HAGL

Lagamorph Scat present

Heather Walker

Vegetation Field Notes

Company Name U.S.L. Date 10/3/87

Location Cottonwood/willows Site White Rock #3 Time 1000

Magnetic Heading 90°E Transect # 1

Species vigor and/or % cover. 2 of 3

L	SAKA	B	B	SAKA	B	B	SAKA	SAKA	B
DRGL	SAKA	B	SAKA	B	DRGL	SAKA	SAKA	SAKA	SAKA
B	B	SAKA	SAKA	B	B	SAKA	SAKA	SAKA	DRGL
R	B	B	B	SAKA	SAKA	SAKA	SAKA	SAKA	SAKA
SAKA	SAKA	SAKA	B	L	B	SAKA	SAKA	ORHY	B
SAKA	B	SAKA	SAKA	L	SAKA	SAKA	B	DRGL	SAKA
SAKA	DRGL	SAKA	SAKA	B	B	SAKA	SAKA	ORHY	SAKA
SAKA	B	DRGL	SAKA	DRGL	SAKA	SAKA	B	SAKA	ATCL
R	SAKA	SAKA	B	R	SAKA	SAKA	SAKA	SAKA	SAKA
B	SAKA	SAKA	B	L	SAKA	SAKA	SAKA	SAKA	B
SAKA	SAKA	DRGL	SAKA	L	SAKA	SAKA	SAKA	SAKA	DRGL
SAKA	B	SAKA	SAKA	B	SAKA	SAKA	DRGL	SAKA	SAKA
SAKA	DRGL	SAKA	SAKA	ATCL	SAKA	SAKA	SAKA	SAKA	SAKA
SAKA	SAKA	SAKA	SAKA	DRGL	AGSP	SAKA	B	SAKA	SAKA
B	SAKA	B	SAKA	SAKA	SAKA	SAKA	B	SAKA	SAKA
SAKA	DRGL	SAKA	SAKA	SAKA	SAKA	B	SAKA	SAKA	B
DRGL	SAKA	AGROP	B	SAKA	L	SAKA	SAKA	SAKA	L
SAKA	SAKA	SAKA	B	DRGL	L	B	B	SAKA	SAKA
B	AGROP	SAKA	SAKA	SAKA	SAKA	SAKA	SAKA	DRGL	SAKA
SAKA	DRGL	SAKA	B	SAKA	SAKA	DRGL	AGROP	ORHY	DRGL

Comments & Observations Mustard
AGSP

Vegetation Field Notes

Company Name UP&L Date 10/3/97

Location Cottonwood/Wilberg Site Waste Rock #3 Time 10:15

Magnetic Heading 90°E Transect # 1

Species vigor and/or % cover. 3 of 3.

SAKA	B	SAKA	AGROP	B	SAKA	B	B	B	SAKA
SAKA	SAKA	B	SAKA	B	SAKA	SAKA	SAKA	B	L
B	ORHYH	SAKA	SAKA	ATCU	B	SAKA	SAKA	SAKA	B
SAKA	SAKA	ORHYH	B	SAKA	B	SAKA	SAKA	B	B
B	SAKA	SAKA	SAKA	SAKA	B	B	B	B	SAKA
ORHYH	DAGL	B	B	SAKA	SAKA	SAKA	SAKA	SAKA	SAKA
SAKA	SAKA	SAKA	SAKA	SAKA	SAKA	SAKA	B	SAKA	SAKA
ORHYH	SAKA	ATCU	R	L	SAKA	SAKA	SAKA	B	SAKA
B	SAKA	SAKA	SAKA	SAKA	B	B	SAKA	SAKA	SAKA
B	SAKA	B	ORHYH	B	B	SAKA	SAKA	SAKA	B

Comments & Observations

ATTACHMENT 17

SEED MIXTURE

BERM #3

SCIENTIFIC NAME	COMMON NAME
Agropyron crestatum	Crested wheatgrass
Oryzopsis hymenoides	Indian ricegrass
Stipa comata	Needle & thread grass
Agropyron smithii	Western wheatgrass
Halaria sp.	Galleta grass
Melilotus officinalis	Yellow sweetclover
Sphairalcea coccinea	Scarlet globemallow
Artemesia tridentata	Mt. big sagebrush
Atriplex canescens	4-wing saltbrush
Ephedra viridis	Green ephedra
Cercocarpus montanus	Birchleaf mahogany

SPECIES LIST

WASTE ROCK BERM #3

SYMBOL	SCIENTIFIC NAME	COMMON NAME
AGCR	Agropyron cristatum	Crested wheatgrass
DAGL	Dactylis glomerata	Orchardgrass
AGIN	Agropyron intermedium	Intermediate wheatgrass
SIHY	Sitanion hystrix	Squirreltail grass
ORHYH	Oryzopsis hymenoides	Indian ricegrass
AGROP	Agropyron sp.	Wheatgrass
SAKA	Salsola kali	Russian thistle
ATCU	Atriplex cuneatus	4-wing saltbush

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t-Test at 90% Confidence Level

$$n = \frac{[t]^2\ [s]^2}{[10\%\ \text{mean}]^2}$$

t = 1 tail at 90% confidence is 1.299 with df = 49 [50-1]

Variance = standard deviation squared $[s^2]$ = 2.85

Sample mean $[\bar{x}]$ = 7.92

Sample size [n] = 50

Sample size needed for a 90% confidence

$$n = \frac{[1.299]^2\ [\ 2.85\ ]}{.63} = 7.63$$

should be at or below 50

VEGETATIVE COVER

WASTE ROCK BERM #3

Vegetative Cover	57.4%
Undesirables	39.0%
SAKA	39.0%
Desirables	18.4%
AGCR	3.4%
AGIN	1.8%
DAGL	2.2%
SIHY	8.0%
ORHYH	1.0%
ATCU	2.0%
Litter	1.2%
Rock	2.8%
Bare Ground	38.6%
TOTAL	100.0%

Vegetation Field Notes

Company Name UP&L Date 10/3/87

Location Cottonwood/Wilberg Site Berm #3 Waste Rock Time 1030

Magnetic Heading 125° SE Transect #

1 of 3

Species vigor and/or % cover.

SAKA	SAKA	SAKA	SAKA	SAKA	R	SAKA	B	SAKA	SAKA
SAKA	SAKA	SAKA	SAKA	SAKA	SAKA	SAKA	SAKA	SAKA	SAKA
SAKA	SAKA	B	SAKA	B	SAKA	R	SAKA	SAKA	SAKA
SAKA	AGIN	R	AGIN	ORHYH	SAKA	SAKA	SAKA	SAKA	SAKA
B	SAKA	R	SAKA	SAKA	SAKA	SAKA	SAKA	SAKA	SAKA
SAKA	SAKA	SAKA	SAKA	SAKA	SAKA	SAKA	SAKA	SAKA	SAKA
SAKA	B	SAKA	SAKA	B	SAKA	SAKA	SAKA	SAKA	SAKA
SAKA	R	SAKA	SAKA	SAKA	SAKA	SAKA	SAKA	SAKA	SAKA
B	SAKA	SAKA	SAKA	SAKA	SAKA	SAKA	SAKA	SAKA	SAKA
SAKA	SAKA	SAKA	SAKA	SAKA	SAKA	SAKA	SAKA	SAKA	SAKA
SAKA	SAKA	SAKA	SAKA	SAKA	SAKA	SAKA	B	SAKA	SAKA
SAKA	ATCU	SAKA	SAKA	B	B	SAKA	AGIN	SAKA	SAKA
SAKA	SAKA	SAKA	SAKA	AGCR	SAKA	B	ORHY	SAKA	SAKA
SAKA	SAKA	SAKA	AGCR	DRGL	SAKA	ATCU	SAKA	B	SAKA
SAKA	R	SAKA	SAKA	SAKA	SAKA	SAKA	SAKA	AGIN	AGIN
SAKA	SAKA	SAKA	SAKA	SAKA	SAKA	SAKA	SAKA	SAKA	SAKA
SAKA	SAKA	SAKA	SAKA	SAKA	SAKA	SAKA	SAKA	SAKA	SAKA
SAKA	SAKA	SAKA	B	B	B	SAKA	SAKA	SAKA	B
B	SAKA	SAKA	B	SAKA	SAKA	SAKA	SAKA	SAKA	SAKA
SAKA	SAKA	SAKA	SAKA	SAKA	SAKA	SAKA	B	SAKA	DRGL

Comments & Observations ATCU AGSMS Hounds tongue
SAKA AGCR
ORHYH

Heather Weeker

Vegetation Field Notes

Company Name UPRL **Date** 10/3/87

Location Cottonwood/Wilburg **Site** Waste Rock Dump #3 **Time** _____

Magnetic Heading 125° SE **Transect #** 1

Species vigor and/or % cover. 2 of 3

SAKA	SAKA	AGSP	ATCU	SAKA	SAKA	SAKA	SAKA	SAKA	SAKA
SAKA	SAKA	SAKA	SAKA	SAKA	SAKA	SAKA	SAKA	SAKA	L
SAKA	SAKA	SAKA	SAKA	B	SAKA	SAKA	SAKA	B	SAKA
SAKA	SAKA	R	SAKA	SAKA	ORHYM	SAKA	SAKA	B	SAKA
SAKA	SAKA	ATCU	SAKA	SAKA	SAKA	SAKA	SAKA	SIHY	SAKA
B	SAKA	SAKA	SAKA	B	SAKA	B	AGCR	SAKA	SAKA
B	SAKA	AGCR	ATCU	AGCOP	SAKA	SAKA	SAKA	SAKA	SAKA
B	AGCR	AGCR	B	B	B	SAKA	AGCR	SAKA	SAKA
SAKA	AGCR	R	SIHY	B	SAKA	B	SAKA	B	B
AGSP	L	TRGL	TRGL	B	B	B	B	TRGL	B
SAKA	B	B	TRGL	SAKA	SAKA	SAKA	SAKA	SAKA	SAKA
AGCR	SAKA	R	SAKA	AGCR	B	B	B	B	SAKA
SIHY	SIHY	SIHY	SIHY	B	SAKA	SAKA	SAKA	SAKA	SIHY
SIHY	SIHY	SIHY	B	B	SAKA	SAKA	AGCR	B	B
SIHY	SIHY	SIHY	B	ORHYM	SIHY	SAKA	SIHY	B	SIHY
SIHY	SIHY	SIHY	SIHY	B	SIHY	B	SIHY	SIHY	B
SIHY	SIHY	SAKA	SAKA	SAKA	SIHY	L	SIHY	SIHY	AGCR
ATCU	SIHY	R	B	B	SIHY	B	SIHY	SIHY	SIHY
R	TRGL	R	SAKA	R	SAKA	SAKA	SAKA	SAKA	SAKA
SIHY	R	SIHY	SIHY	SIHY	AGCR	SIHY	B	SAKA	SAKA

Comments & Observations Lagamorph Scat present

Vegetation Field Notes

Company Name UP&L Date 10/3/87

Location Cottonwood/Wilberg Site Waste Rock Burn #3 Time

Magnetic Heading 125° SE Transect # 1

Species vigor and/or % cover. 3 of 3

SAKA	SIHY	B	L	B	AGCR	AGCR	B	SAKA	B
SAKA	SAKA	SAKA	SAKA	B	AGIN	L	SAKA	ATCU	IRGL
SIHY	SIHY	SAKA	B	SAKA	IRGL	SAKA	SAKA	B	ATCU
SAKA	SAKA	SAKA	B	ORHY	L	SAKA	AGCR	ATCU	SAKA
SAKA	SAKA	SAKA	AGIN	B	SAKA	B	B	SAKA	B
SAKA	SAKA	SAKA	SAKA	B	B	SAKA	SAKA	SAKA	IRGL
B	B	B	AGCR	B	B	SAKA	B	SAKA	SAKA
SAKA	SAKA	SAKA	B	B	B	SAKA	SAKA	SAKA	B
SAKA	IRGL	ATCU	SAKA	B	SAKA	SAKA	SAKA	B	L
SAKA	SAKA	SAKA	SAKA	SAKA	AGCR	SAKA	SAKA	SAKA	SAKA

Comments & Observations Cow Scat present but rare

ATTACHMENT 18

SEED MIXTURE

FOR CELL #4

SCIENTIFIC NAME	COMMON NAME
Agropyron crestatum	Crested wheatgrass
Oryzopsis hymenoides	Indian ricegrass
Stipa comata	Needle & thread grass
Agropyron smithii	Western wheatgrass
Halaria sp.	Galleta grass
Melilotus officinalis	Yellow sweetclover
Sphairalcea coccinea	Scarlet globemallow
Artemesia tridentata	Mt. big sagebrush
Atriplex canescens	4-wing saltbrush
Ephedra viridis	Green ephedra
Cercocarpus montanus	Birchleaf mahogany

SPECIES LIST

WASTE ROCK #4

SYMBOL	SCIENTIFIC NAME	COMMON NAME
AGROP	Agropyron sp.	Wheatgrass
HEBO	Hedysarum boreale	Northern sweetvetch
SAKA	Salsola kali	Russian thistle
ATCU	Atriplex cuneatus	4-wing saltbush

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t-Test at 90% Confidence Level

$$n = \frac{[t]^2\ [s]^2}{[10\%\ \text{mean}]^2}$$

t = 1 tail at 90% confidence is 1.299 with df = 49 [50-1]

Variance = standard deviation squared $[s^2]$ = 1.67

Sample mean $[\bar{x}]$ = 7.72

Sample size [n] = 50

Sample size needed for a 90% confidence

$$n = \frac{[1.299]^2\ [\ 1.67\ ]}{.596} = 4.73$$

should be at or below 50

VEGETATIVE COVER

WASTE ROCK #4

Vegetative Cover		77.4%
Undesirables		75.8%
SAKA	75.8%	
Desirables		1.4%
HEBO	0.4%	
ATCU	1.0%	
AGROP	0.2%	
Litter		2.8%
Rock		0.4%
Bare Ground		19.4%
TOTAL		100.0%

Vegetation Field Notes

Company Name UP&L Date 10/3/87

Location Cottonwood/Wilburg Site Waste Fork #4 Time 1120

Magnetic Heading 185° S Transect # 1

Species vigor and/or % cover. 1 of 3

SAKA	SAKA	SAKA	SAKA	SAKA	SAKA	SAKA	SAKA	SAKA	SAKA
SAKA	SAKA	SAKA	SAKA	B	B	SAKA	SAKA	SAKA	L
B	SAKA	SAKA	R	SAKA	SAKA	SAKA	SAKA	SAKA	B
B	SAKA	SAKA	SAKA	B	SAKA	SAKA	SAKA	SAKA	B
SAKA	SAKA	SAKA	SAKA	SAKA	SAKA	SAKA	SAKA	SAKA	B
SAKA	SAKA	B	SAKA	B	SAKA	SAKA	SAKA	B	SAKA
SAKA	B	SAKA	SAKA	L	B	B	SAKA	SAKA	SAKA
SAKA	SAKA	B	SAKA	SAKA	SAKA	SAKA	SAKA	SAKA	B
SAKA	SAKA	SAKA	HEBO	SAKA	SAKA	B	SAKA	SAKA	SAKA
SAKA	SAKA	SAKA	SAKA	SAKA	L	B	SAKA	B	SAKA
SAKA	SAKA	SAKA	SAKA	SAKA	SAKA	B	B	SAKA	SAKA
B	SAKA	SAKA	SAKA	SAKA	SAKA	B	SAKA	SAKA	B
SAKA	SAKA	SAKA	SAKA	B	B	HEBO	SAKA	SAKA	SAKA
SAKA	SAKA	B	SAKA	L	SAKA	SAKA	SAKA	SAKA	SAKA
SAKA	SAKA	L	SAKA	SAKA	SAKA	SAKA	SAKA	SAKA	B
B	B	SAKA	SAKA	SAKA	SAKA	SAKA	SAKA	L	SAKA
SAKA	SAKA	SAKA	SAKA	SAKA	B	B	SAKA	B	SAKA
SAKA	SAKA	SAKA	SAKA	SAKA	B	SAKA	SAKA	SAKA	B
SAKA	SAKA	SAKA	B	B	SAKA	SAKA	B	SAKA	SAKA
SAKA	SAKA	SAKA	SAKA	SAKA	SAKA	SAKA	B	SAKA	B

Comments & Observations Hebo Not the succulent one
AFCU

Leafmorph seat abundant

Heather Weeker

Vegetation Field Notes

Company Name UP&L Date 10/3/87

Location Cottonwood/Willburg Site White Rock #4 Time

Magnetic Heading 185° S Transect # 1

Species vigor and/or % cover. 2 of 3

L	SAKA	SAKA	SAKA	SAKA	B	B	B	B	SAKA
SAKA	SAKA	B	SAKA	SAKA	SAKA	B	B	B	SAKA
B	SAKA	SAKA	SAKA	SAKA	B	SAKA	SAKA	SAKA	B
AGROP	SAKA	SAKA	SAKA	B	B	B	B	SAKA	SAKA
SAKA	SAKA	SAKA	SAKA	SAKA	SAKA	L	B	L	SAKA
SAKA	SAKA	SAKA	SAKA	B	SAKA	SAKA	SAKA	SAKA	SAKA
SAKA	SAKA	SAKA	B	SAKA	SAKA	SAKA	SAKA	B	SAKA
SAKA	SAKA	SAKA	SAKA	SAKA	B	SAKA	SAKA	SAKA	SAKA
SAKA	SAKA	SAKA	SAKA	SAKA	SAKA	SAKA	SAKA	SAKA	SAKA
B	SAKA	SAKA	SAKA	L	SAKA	SAKA	SAKA	SAKA	R
SAKA	SAKA	B	SAKA	SAKA	SAKA	SAKA	L	SAKA	SAKA
L	L	L	SAKA	SAKA	L	SAKA	SAKA	SAKA	SAKA
SAKA	SAKA	SAKA	SAKA	SAKA	SAKA	SAKA	SAKA	SAKA	B
SAKA	B	B	SAKA	SAKA	SAKA	SAKA	SAKA	SAKA	B
SAKA	B	B	SAKA	SAKA	SAKA	B	SAKA	ATCU	SAKA
SAKA	SAKA	SAKA	SAKA	SAKA	ATCU	SAKA	ATCU	ATCU	SAKA
SAKA	SAKA	SAKA	SAKA	SAKA	SAKA	SAKA	SAKA	SAKA	SAKA
SAKA	SAKA	SAKA	ATCU	SAKA	SAKA	SAKA	B	SAKA	SAKA
SAKA	B	SAKA	SAKA	SAKA	SAKA	B	B	SAKA	SAKA
B	B	B	SAKA	SAKA	SAKA	B	B	SAKA	SAKA

Comments & Observations

Vegetation Field Notes

Company Name UPSL Date 10/3

Location Cottonwood/Wilbug Site Waste Rock #34 Time

Magnetic Heading 185°S Transect # 1

Species vigor and/or % cover. 3 of 3

B	SAKA	SAKA	SAKA	B	SAKA	SAKA	SAKA	SAKA	SAKA
B	B	B	B	SAKA	SAKA	SAKA	SAKA	SAKA	SAKA
SAKA	SAKA	R	SAKA	B	SAKA	SAKA	SAKA	B	SAKA
SAKA	B	SAKA	SAKA	SAKA	B	SAKA	SAKA	SAKA	SAKA
SAKA	SAKA	B	SAKA	SAKA	SAKA	SAKA	SAKA	SAKA	SAKA
SAKA	SAKA	B	SAKA	SAKA	SAKA	SAKA	SAKA	SAKA	SAKA
SAKA	SAKA	SAKA	SAKA	SAKA	SAKA	SAKA	SAKA	SAKA	SAKA
SAKA	SAKA	B	SAKA	SAKA	SAKA	SAKA	B	SAKA	SAKA
SAKA	B	SAKA	SAKA	SAKA	SAKA	SAKA	SAKA	B	SAKA
B	B	B	SAKA	SAKA	SAKA	SAKA	B	SAKA	SAKA

Comments & Observations

ATTACHMENT 19

SEED MIXTURE

FOR BERM #4

SCIENTIFIC NAME	COMMON NAME
Agropyron crestatum	Crested wheatgrass
Oryzopsis hymenoides	Indian ricegrass
Stipa comata	Needle & thread grass
Agropyron smithii	Western wheatgrass
Halaria sp.	Galleta grass
Melilotus officinalis	Yellow sweetclover
Sphairalcea coccinea	Scarlet globemallow
Artemesia tridentata	Mt. big sagebrush
Atriplex canescens	4-wing saltbrush
Ephedra viridis	Green ephedra
Cercocarpus montanus	Birchleaf mahogany

SPECIES LIST

WASTE ROCK #4 BERM

SYMBOL	SCIENTIFIC NAME	COMMON NAME
AGCR	Agropyron cristatum	Crested wheatgrass
AGIN	Agropyron intermedium	Intermediate wheatgrass
SAKA	Salsola kali	Russian thistle
ATCU	Atriplex cuneatus	4-wing saltbush

t-Test at 90% Confidence Level

$$n = \frac{[t]^2\ [s]^2}{[10\%\ \text{mean}]^2}$$

t = 1 tail at 90% confidence is 1.299 with df = 49 [50-1]

Variance = standard deviation squared $[s^2]$ = 2.36

Sample mean $[\bar{x}]$ = 3.38

Sample size [n] = 50

Sample size needed for a 90% confidence

$$n = \frac{[1.299]^2\ [\ 2.36\ ]}{.114} = 34.9$$

should be at or below 50

VEGETATIVE COVER

WASTE ROCK #4 BERM

Vegetative Cover		43.0%
Undesirables	1.0%	
SAKA	1.0%	
Desirables		42.0%
AGIN	24.8%	
ATCU	7.2%	
AGCR	10.0%	
Litter		0.4%
Rock		4.4%
Bare Ground		52.2%
TOTAL		100.0%

Vegetation Field Notes

Company Name UP&L Date 10/3

Location Cottonwood/Wilkens Site Wast Rock Berm #4 Time

Magnetic Heading 115°SE Transect #

Species vigor and/or % cover. 10/3

B	B	B	AGIN	B	B	AGIN	B	B	B
B	B	B	AGIN	B	B	B	B	ATCU	ATCU
ATCU	B	B	B	AGIN	B	ATCU	B	B	ATCU
B	B	AGIN	B	B	B	B	B	B	B
B	B	B	ATCU	ATCU	B	B	B	ATCU	B
ATCU	ATCU	ATCU	B	B	B	AGIN	AGIN	B	B
B	B	ATCU	B	B	B	B	B	B	B
B	B	B	ATCU	AGIN	B	B	B	SAKA	AGIN
L	AGIN	ATCU	ATCU	AGIN	B	B	B	AGIN	B
B	B	B	B	B	B	AGIN	B	B	R
AGIN	AGIN	B	B	B	SAKA	B	B	AGIN	AGIN
B	B	B	AGIN	L	B	B	B	AGIN	AGIN
B	B	B	B	B	B	B	B	AGIN	B
B	B	B	B	B	R	B	B	B	B
B	B	B	AGIN	AGIN	AGCR	R	B	AGCR	R
B	B	AGIN	AGIN	B	B	B	B	R	AGIN
B	B	AGIN	B	AGIN	B	B	B	B	AGIN
B	ATCU	ATCU	B	B	AGIN	B	B	AGIN	B
B	B	ATCU	AGCR	B	AGIN	AGIN	AGIN	R	B
B	B	B	SAKA	B	B	B	B	B	ATCU

Comments & Observations Lagamorph Scat + urine sign abundant

Heather Welker

Vegetation Field Notes

Company Name UPSL **Date** 10/3

Location Cottonwood Wells **Site** Waste Rock Berm #4 **Time** _____

Magnetic Heading _____ **Transect #** _____

Species vigor and/or % cover. 2053

AGSM	ATCU	ATCU	B	ATCU	B	B	B	B	B
B	ATCU	AGSM	B	B	B	B	B	B	R
B	B	B	B	AGSM	B	B	B	B	B
AGSM	AGSM	B	AGSM	B	B	AGSM	B	AGSM	B
R	AGSM	B	B	B	B	ATCU	B	B	B
AGSM	AGSM	AGSM	R	B	B	B	B	B	B
AGSM	B	R	B	AGSM	AGSM	B	AGSM	AGSM	B
AGSM	AGSM	R	AGSM	R	B	B	B	B	AGSM
ATCU	ATCU	B	B	AGCR	R	B	B	B	AGSM
AGSM	B	B	B	B	B	B	B	B	AGSM
AGSM	AGSM	AGSM	B	B	ATCU	B	B	B	AGSM
ATCU	AGSM	AGSM	B	B	B	AGSM	AGSM	R	B
B	B	AGSM	B	AGSM	AGSM	AGSM	B	AGSM	B
R	ATCU	B	B	B	AGSM	AGSM	R	AGSM	R
B	B	B	AGSM	B	B	B	B	AGSM	AGSM
B	B	B	AGSM	AGSM	B	B	B	AGSM	B
B	B	B	B	AGSM	AGSM	AGSM	AGSM	AGSM	AGSM
B	AGSM	B	B	B	AGSM	AGSM	B	AGSM	AGSM
B	B	B	B	B	I	ATCU	B	B	B
B	B	B	ATCU	B	AGSM	AGSM	R	AGSM	AGSM

Comments & Observations _____

Vegetation Field Notes

Company Name UP&L Date 10/3

Location Cottonwood/Wilberg Site Waste Rock Peru #4 Time

Magnetic Heading Transect #

Species vigor and/or % cover. 3 of 3

B		B		B		AGIN		B		B		B		AGIN		B		AGIN			
B		R		B		B		B		B		AGIN		B		B		B			
B		B		B		AGIN		B		ATCU		ATCU		B		ATCU		B			
B		B		B		B		B		B		AGIN		R		B		B			
B		AGIN		B		B		B		AGIN		AGIN		ATCU		B		B			
AGIN		AGIN		R		AGIN		B		AGIN		B		AGIN		R		B			
B		B		B		B		B		SAKA		SAKA		B		AGIN		AGIN			
AGIN		R		B		R		B		AGIN		AGIN		B		AGIN		AGIN			
B		B		L		AGIN		AGIN		ATCU		R		B		ATCU		AGIN			
AGIN		B		B		B		AGIN		B		R		AGIN		AGIN		B			

Comments & Observations

1987 VEGETATION SURVEY

UTAH POWER AND LIGHT COMPANY

OLD FAN ROAD AND ASSOCIATED REFERENCE AREA

COTTONWOOD/WILBERG

FINAL RECLAMATION SURVEY
OLD FAN ROAD AND REFERENCE AREA
COTTONWOOD/WILBERG

General Background:

Both the Old Fan Road and the reference area are located on Upper Grimes Wash, a tributary to Cottonwood Creek. The properties are located approximately 7 miles north of Orangeville, Utah [see Location Map - Figure 1]. The Old Fan Road encompasses 0.8 acres of reclaimed land. The Fan Portal Road is located within a federal lease boundary. The reference area is located on the Manti-LaSal National Forest. The elevation of the properties is 7,450'.

Planting Methodologies:

The Old Fan Road was reclaimed in the spring of 1984. The following methodologies were implemented:

The seed mixture was combined with 2000 pounds per acre of wood fiber mulch and the area was hydroseeded and mulched in a single application. Approximately 80 pounds per acre of Terra-Tac AR was incorporated in the mulch seed slurry.

Conclusions and Recommendations:

Old Fan Road: The survey was completed September 27, 1987. The overall appearance of the entire site is excellent. Plant vigor is excellent with the majority of the vegetative cover consisting of well established desirable species. No evidence of erosion or adverse impacts from grazing, insects and rodents is present.

Reference Area: The survey was completed September 28, 1987. The overall appearance of the entire site is good. Plant vigor is good and no undesirable species were located in the survey. No evidence of erosion, or adverse impacts from grazing, insects and rodents is present.

Comparing Old Fan Road with Reference Area:

The average number of samples per plot containing vegetative cover on the Old Fan Road site is 3.52 and on the Reference site is 1.14. This difference, according to the student's-t statistical test is significant. The average number of woody plants per acre are 2352.9 and 806.2 for the reclaimed and reference areas, respectively. The woody plants located on the Old Fan Road reclaimed site, are typically small and low-growing such as Shadscale and rabbitbrush. This growth form would promote greater woody stem density than areas containing larger, well established trees and shrubs, such as the reference area. Low growing shrubs also allows for greater representation of grass and forb species. The dried weight for vegetative cover produced during the 1987 growing season is 805.1 pounds per acre and 442.6 pounds per acre for the Old Fan Road and

Reference areas, respectively.

The survey data indicates no further monitoring of reclamation success on the Old Fan Road is necessary.

Survey results, species list and example of field notes are included as Attachment 20.

ATTACHMENT 20

Comparison of The Total Vegetative Cover

	Reclaimed	Reference
Sample Mean $[\bar{x}]$	3.52	1.14
Variance $[s^2]$	7.27	1.55
Sample Size $[n]$	50	50

t = 2 tail t at 90% Confidence is 1.66 with df = 98 $[n_1+n_2-2]$.

$$\frac{X_1-X_2}{\sqrt{\frac{S_1^2}{n_1}-\frac{S_2^2}{n_2}}} \qquad \frac{3.52 - 1.14}{\sqrt{.15 - .03}} = 6.88^*$$

* The obtained t shows a significant difference in the two areas if it is equal to or greater than 1.66.

Comparison of Woody Plant Density

	Reclaimed	Reference
Mean point to plant distance $[\bar{x}]$	2.71	2.56
Mean area per woody plant $[\bar{x}^2]$	7.34	6.55
Number of woody plants per acre $\frac{4047m^2/Acre}{[\bar{x}]^2}$	551.4	617.8

SEED MIXTURE

OLD FAN ROAD

COMMON NAME	SCIENTIFIC NAME
Western wheatgrass	Agropyron smithii
Indain ricegrass	Oryzopsis hymenoides
Thickspike wheatgrass	Agropyron dasystachyum
Bottlebrush squirreltail	Sitanion hystrix
Salina wildrye	Elymus salinus
Utah sweetvetch	Hedysarum boreale
Eaton penstemon	Penstemon eatonii
Yellow sweetclover	Melilotus officinalis
Pacific aster	Aster chilensis
Corymbed Eriogonum	Eriogonum corymbosium

SPECIES LIST

OLD FAN PORTAL ROAD

SYMBOL	SCIENTIFIC NAME	COMMON NAME
AGSMS	Agropyron smithii	Western wheatgrass
ELCI	Elymus cinereus	Great basin wildrye
BRMA	Bromus marginatus	Mountain brome
HEBO	Hedysarum boreale	Northern sweetvetch
ASCH[2]	Aster chilensis	Pacific aster
ERIOG	Eriogonum sp.	Eriogonum
SAKA	Salsola kali	Russian thistle
ATCO	Atriplex confertifolia	Shadscale
CHVI	Chrysothamnus viscidiflorus	Little rabbitbrush
ATCU	Atriplex canescens	4-wing saltbush

t-Test at 90% Confidence Level

$$n = \frac{[t]^2\ [s]^2}{[10\%\ \text{mean}]^2}$$

t = 1 tail at 90% confidence is 1.299 with df = 49 [50-1]

Variance = standard deviation squared [s^2] = 7.27

Sample mean [$\bar{x}$] = 3.52

Sample size [n] = 50

Sample size needed for a 90% confidence

$$n = \frac{[1.299]^2\ [\ 7.27\ ]}{.123} = 99.7$$

should be at or below 50 *

*The Old Fan Portal Road property shows a large amount of variability in vegetative cover. The maximum number of samples required by DOGM [50] is still insufficient in accounting for all variability.

VEGETATIVE COVER

OLD FAN PORTAL ROAD

Vegetative Cover	35.6%
Undesirables	0.4%
SAKA	0.4%
Desirables	35.2%
AGSMS	2.8%
ELCI	1.0%
BRMA	0.4%
HEBO	0.2%
ASCH[2]	22.4%
ERIOG	0.2%
ATCO	2.8%
CHVI	4.2%
ATCU	1.2%

Litter	14.8%
Rock	15.8%
Bare Ground	33.8%
TOTAL	100.0%

SPECIES LIST

OLD FAN PORTAL REFERENCE AREA

SYMBOL	SCIENTIFIC NAME	COMMON NAME
AGSMS	Agropyron smithii	Western wheatgrass
ORHYH	Oryzopsis hymenoides	Indian ricegrass
PEPA	Penstemon palmeri	Palmer penstemon
HEBO	Hedysarum boreale	Northern sweetvetch
AMAL	Amalanchier alnifolia	Serviceberry
CHNA	Chrysothamnus nauseosus	Rubber rabbitbrush
JUSC	Juniperus scopulorum	Rocky mt. juniper
PSME	Pseudotsuga menzesii	Douglas fir

t-Test at 90% Confidence Level

$$n = \frac{[t]^2\ [s]^2}{[10\%\ \text{mean}]^2}$$

t = 1 tail at 90% confidence is 1.299 with df = 49 [50-1]

Variance = standard deviation squared $[s^2]$ = 1.55

Sample mean $[\bar{x}]$ = 1.14

Sample size [n] = 50

Sample size needed for a 90% confidence

$$n = \frac{[1.299]^2\ [\ 1.55\ ]}{.013} = 201$$

should be at or below 50 *

* The Old Fan Portal Reference Area property shows a large amount of variability in vegetative cover. The maximum number of samples required by DOGM [50] is still insufficient in accounting for all variability.

VEGETATIVE COVER

OLD FAN PORTAL REFERENCE AREA

Vegetative Cover		11.4%
Undesirable		0%
Desirables		11.4%
	AGSMS	8.2%
	ORHYH	0.4%
	HEBO	1.4%
	PEPA	0.2%
	CHNA	0.8%
	AMAL	0.2%
	PIED	0.2%

Litter	22.4%
Rock	30.2%
Bare Ground	36.0%
TOTAL	100.0%

Vegetation Field Notes

Company Name UPSL Date 9/27

Location Cottonwood Wilberg Mine Site Old Portal Road Time 1600

Magnetic Heading _____ Transect # 1 FINAL RECL.

Page 1 of 3

Species vigor and/or % cover.

1	ASCH 2		ASCH		ASCH 2		ASCH 2		ASCH 2		L	10%	ASCH 2	90%	ASCH 2		ASCH 2		ASCH 2				
2	L		L		L		L		ASCH 2		ASCH 2		ASCH 2		ASCH 2		ASCH 2		ASCH 2	100%			
3	ASCH 2		ASCH 2		ASCH 2		ASCH 2		ASCH 2		ASCH 2		ASCH 2		ASCH 2		ASCH 2		ASCH 2	100%			
4	R	5%	L	5%	ASCH 2	80%	ASH 2		ASCH 2		ASCH 2		ASCH 2		ASCH 2		ASCH 2		ASCH 2				
5	R		R		R		R	85%	ASCH	15%	R		R		R		R		R				
6	ASCH 2		ASCH 2		ASCH 2		ASCH 2		ASCH 2		ASCH 2	80%	R	20%	R		R		ASCH 2				
7	R		R		R		R		R		R		R		ASCH 2	5%	R	75%	R				
8	L		L		ASCH 2		L		ASCH 2		ASCH 2		ASCH 2		ASCH 2	95%	L	50%	L	45H 5%			
9	R		R		R		ASCH 2		L	5%	ASCH 2		ASCH 2		ASCH 2		ASCH 2		R	20%			
10	ASCH 2	5%	B	75%	R	10%	L		B		L		B		B		R		L	ASSM CH 5 5%			
11	ASCH 2	10	CHVI		CHVI	35	ASCH 2		L	10%	B	30%	CHVI		L		R	5%	R	ORH			
12	B		L		L	10%	L		L		L		B 60%		B		B		B				
13	B		B		B		L	10%	B	80%	SAKA	5%	B		B		B		L				
14	B	5%	R	95	R		R		R		R		R		ASCH	10%	R		R				
15	R		R		R		R		R	70%	B	10%	B		B		L		R	ORH ASCH 5			
16	L		L	10%	AGSM	5%	B	70%	B		B		B		B		L		B	ELSA ASCH 5			
17	BRMA	5%	R	5%	ASCH 2		L	90%	CHVI	10%	B		B	55%	B		B		AGSM	50%			
18	R	60%	ELSA	15%	ELSA		B		B		L	15%	L		B		B		AGSM	ASCH 5			
19	B	75%	ELSA		L	5%	ELSA	10%	R	5%	B		B		B		B		B	unk #1			
20	L	5%	B	10%	B		ATCU	85%	ATCU		B		ATCU		ATCU		ATCU		ATCU				

Comments & Observations ATCO-Shadscale

Salsola Ag Circium Hologeton HAGL

Bromus tectorum Erodium Unknown #1 Cup Sed Sed

Heather Weeks

Vegetation Field Notes

Company Name Wilberg UP&L Date 9/27/87

Location Cottonwood Mine Site Old Portal Road Time 1635

Magnetic Heading ________ Transect # 1 FINAL RECL.

Pg 1 of 3

Species vigor and/or % cover.

	ASCH²	ASCH² 20%	R	B 60%	R 10%	B	R	L	R	B ORHY 10%
	ASCH²	ASCH²	L	ASCH² 70%	R 5%	L 15%	L	BRTE 5%	ASCH²	ASCH
	L	B 50%	R 5%	L 20	B	L	B	ASCH² 20%	B	L AGSM 5
	ASCH² 15%	ASCH²	ELCA 10%	B	B 50%	R 5%	B	AGSM 5	B	L 20%
25	B	L	L	L	B 55%	L 20%	L	CHVI 10%	B	L ORHY 5%
	L	L	L	B 70%	L 15%	CHVI 5%	L	ATCO 5%	B	SAKA 5%
	B	CHVI	CHVI	CHVI 50%	L	R	R	R 35%	R	B 15%
	ATCO 15%	ATCO	ATCO	B	B	B 65%	B	B	R 10	B AGSM 5%
	B	B	B	AGSM 10%	B 85%	B	B	B	B	L ASCH
	R	L 5%	R 20%	B	B	B 60%	B	B	ASCH² 5%	B
	ASCH² 30%	L	L trace	B	B	AGSM 10%	B 60%	B	B	B
	CHVI 65%	CHVI	CHVI	CHVI	B 10%	HEBO 5%	ASCH² 10%	L 10%	ASCH	R 5%
	L	B	B 50%	L	B	L 10%	L	L	B	CHVI 25% ORHY 5
	B	CHVI 20	ATCO 5%	B 65%	B	ERIO 5%	B	B	B	B ORHY
35	B	B	B	CHVI 30%	B 60%	B	SAKA 10%	B	B	B
	B	ASCH²	B	B 75%	B	ASCH² 10%	ASCH²	ASCH	R 15%	B
	B	B	ASCH² 10%	B	B 25%	B	B	CHVI 5%	B	B
	B	B	B	R 5%	B	B	B	B 80%	CHVI 25%	B
	B	B	B	B	AGSM 15	CHVI 5	B 50%	B	AGSM 5	AGSM 5
40	B	CHVI 5%	B 5%	ASCH²	B	B	ASCH² 40%	ASCH²	B	R 5%

Comments & Observations AGCR - crested wheatgrass

ER - eriogonum

Heather Welker

Vegetation Field Notes

Company Name UP&L Date 9/27/07

Location Cottonwood Wilberg Site old FAN Portal Site Time 1700

Magnetic Heading _____ Transect # 1 FINAL Recl.

Species vigor and/or % cover.

B	ASCHV	ASCH 70% ASCH	ASCH	CHVI 30% ASCH	CHVI	ASCH	L 10%
B	R 35% B 40% B	L 30	B	B	B	B ASCH 10	R CHVI 10
ASCH 45% ASCH	ASCH	B 30%	R	R	ASCH	R 20% AGSMS 50%	B
ASCH	B	B	B	B	B	CHVI	AGSMS	L	B
45 CHVI	CHVI 60% L	L	B 15%	L 10	R	R	R 15%
R	R	R	R	R 45%	B 40	B	L 5% CHVI 5%	R ASCH 5
AGSMS	L 30%	R	ASCH	ASCH	R	R	R 5%	ASCH 5%	B 10%
ASCH	ASCH	B 25%	ASCH	ASCH 80%	ASCH	ASCH	ASCH	ASCH	ASCH 5%
L	ASCH 45%	15%	ASCH	ASCH	ASCH	ASCH	ASCH	ASCH	ASCH
B	B 35%	L 10%	AGSMS	ASCH	ASCH	ASCH 10%	B	R 30%	AGSMS 5%

Comments & Observations _____

Heather Nielsen

SF—2
Melilotus

Data Sheet 3C.1. *Tabulation of Raw Data from Point-Quarter Plant Sampling.*

Date 9/28/87 Observers H. Welker

Pg 1

Habitat and Stratum

Locality Cottonwood/Wibera Mine old portal Road

Number of points sampled

Point number	Quadrant number	Species	height 1 ft	height 1-3 ft.	Point-to-plant distance* (m)
1	1	O			
1	2	CHVI		✓	1.0M
1	3	O			1.16
1	4	O			
2	1	CHVI		✓	1.10M
2	2	CHVI		✓	1.77M
2	3	CHVI		✓	1.27M
2	4	"		✓	.89M
3	1	CHVI		✓	.53M
3	2	"		✓	.59M
3	3	"		✓	.67M
3	4	"		✓	3.66M
4	1	"		✓	4.48M
4	2	"		✓	3.64M
4	3	"		✓	2.52M
4	4	O		—	—

The above data are to be summarized from a series of similar data sheets on data sheet 3C.2.

* If only relative measures of density, frequency, and coverage are desired, then omit this column.

Page 2

Data Sheet 3C.1. *Tabulation of Raw Data from Point-Quarter Plant Sampling.*

Date 9/28/88 Observers H. Welker

Habitat and Stratum

Locality Cottonwood/Wilbur Old Fay Portal Road.

Number of points sampled

Point number	Quadrant number	Species	height <1 ft	height 1-3 ft.	Point-to-plant distance* (m)
1	1	CHVI	C	✓	1.90 M
1	2	"		✓	2.11 M
1	3	CHVI		✓	.34
1	4	CHVI		✓	.46
2	1	ATCO		✓	.87
2	2	CHVI CHUI	✓	✓	.37 1.62 M
2	3	CHUI ATCO	✓	✓	.47 1.02 M
2	4	CHUI		✓	.70
3	1	CHVI		✓	.55
3	2	CHVI		✓	.78
3	3	"		✓	.36
3	4	" "	✓	✓	1.38 2.5
4	1	"		✓	.43
4	2	" "	✓	✓	.37 1.31
4	3	"		✓	.65
4	4	"		✓	1.57

Evidence of Rabbit Scat

The above data are to be summarized from a series of similar data sheets on data sheet 3C.2.

* If only relative measures of density, frequency, and coverage are desired, then omit this column.

Vegetation Field Notes

Company Name UP&L Date 9/28/87

Location Cottonwood/Wilberg Site Reference Area (old Fan Portal) Time 1310

Magnetic Heading _____ Transect # 1

Species vigor and/or % cover. 1 of 3

AGSMS	B	L	B	B	B	B	B	R	R
B	B	B	B	R	B	B	B	R	B
L	B	L	L	B	AGSMS	AGSMS	B	B	B
L	L	L	L	L	B	L	L	PEPA	L
R	B	B	L	L	B	B	B	AGSMS	L
HEBO	B	B	B	B	ORHY	B	B	L	B
B	B	B	B	R	B	B	B	B	R
B	B	B	B	R	B	B	B	B	B
B PIPI	B "	B "	B	L	B	B	B	L	B
B	B	L	B	R	B	L	AGSMS	L	L
B	L	R	R	B	B	B	R	L	B
L	R	HEBO	R	L	R	L	R	L	L
L	B	L	B	R	L	R	L	R	B
L	L	L	L	L	R	R	ORHY	L	R
R	R	L	L	R	R	R	R	R	L
L	L	L	L	L	R	R	AGSMS	L	L
L	B	B	L	R	L	L	L	B	L
L	L	R	L	L	L	L	R	L	L
B	B	B	L	R	B	L	L	R	L
B	B	HEBO	L	AGSMS	L	B	B	B	L

Comments & Observations PSME Penstemon Palmer

Jusc-Juniper HEBO

AMAL Serviceberry ORHY

Deer Scat moderate

Vegetation Field Notes

Company Name LP&L Date 9/28/87

Location Bitterwood/Ulberg Site Old Fan Portal Reference area Time 1310

Magnetic Heading _____ Transect # 1

Species vigor and/or % cover. 2 of 3

R	L	R	R	L	L	L	L	L	L
B	B	B	L	R	R	R	B	AGSMS	AGSMS
R	B	R	L	R	L	R	RB	R	L
R	L	L	L	L	L PIPI	L PIPI	R	PIED	L
R	R	R	R	R	R	B	B	B	R
R	R	L	R	B	R	R	R	R	R
R	R	R	R	R	AGSMS	AGSMS	AGSMS	R	R
R	R	R	R	R	R	B	R	B	B
L	B	R	B	R	B	R	R	R	R
B	B	B	AGSMS	B	L	L	L	L	L
R	R	L	B	R	R	R	HEBO	B	R
R	AGSMS	B	B	R	R	R	R	B	R
R	R	R	B	R	R	AGSMS	R	AGSMS	B
B	B	L	B	R	R	HEBO	AGSMS	L	B
B	B	B	B	R	B	B	R	B	R
B	B	B	R	AGSMS	R	R	R	R	AGSM
AGSMS	R	R	CHNA	R	AGSMS	R	R	B	L
AGSMS	HEBO	B	B	R	B	B	R	R	AGSMS
AGSMS	B	AGSMS	B	AGSMS	B	R	CHNA	HEBO	R
40 B	B	L	B	B	B	B	B	AGSMS	B

Comments & Observations ASCH-

ARTR-

Vegetation Field Notes

Company Name UP&L Date 9/28/87

Location Cottonwood/Wilberg Site old fan Portal Reference Area Time 1310

Magnetic Heading _____ Transect # 1

Species vigor and/or % cover. 3 of 3

B	B	B	B	AGSMS	R	B	B	B	AGSMS
B	L	AGSM	B	B	B	B	CHNA	L	B
L	AGSMS	R	AGSMS	B	AGSMS	R	R	B	B
AGSMS	R	R	AGSMS	B	AGSMS	R	AGSMS	AGSMS	L
AGSMS	R	R	R	R	B	L	R	R	R
R	R	R	R	R	R	R	R	R	R
AGSM	R	B	B	B	B	B	B	R	B
L	B	B	B	B	B	B	B	B	B
R	L	R	R	R	B	AGSM	L	B	R
CHNA	L	L	L	R	R	R	AMAR	B	L

Comments & Observations _____

Data Sheet 3C.1. *Tabulation of Raw Data from Point-Quarter Plant Sampling.*

Date 9/22/87 Observers H. Welker

Habitat and Stratum

Locality Wilberg Cottonwood/ - Reference area for Old Fan Fortal Road

Number of points sampled 1 of 2

Point number	Quadrant number	Species	height 1 ft	height 1-3 ft.	Point-to-plant distance* (m) Meters
1	1	PIED		✓	1.73M
1	2	PSME		✓	3.64
1	3	PIED		✓	3.36
1	4	PSME		✓	1.68
2	1	PIED		✓	1.31
2	2	PIED		✓	2.89
2	3	PIED		✓	2.58
2	4	PIED		✓	2.08
3	1	AMAL		✓	1.82
3	2	PSME		✓	2.37
3	3	AMAL		✓	3.01
3	4	PIED		✓	3.72
4	1	AMAL		✓	1.92
4	2	PSME		✓	2.11
4	3	PIED		✓	2.98
4	4	PIED		✓	4.57

The above data are to be summarized from a series of similar data sheets on data sheet 3C.2.

* If only relative measures of density, frequency, and coverage are desired, then omit this column.

PIPI Ponderosa Pine PSME = Douglas Fir

Data Sheet 3C.1. *Tabulation of Raw Data from Point-Quarter Plant Sampling.*

Date 9/28/87 Observers H. Welker

Habitat and Stratum

Locality Cottonwood/Wilberg Reference area for old Fan Portal Road

Number of points sampled 2 of 2.

Point number	Quadrant number	Species	height 1 ft	height 1-3 ft.	Point-to-plant distance* (m)
1	1	CH NA		✓	1.37M
1	2	DOFI		✓	402M
1	3	AMAL		✓	.81M
1	4	PIED		✓	1.32
2	1	CH NA		✓	1.15
2	2	CH NA		✓	1.15
2	3	CH NA		✓	2.13
2	4	PIED DOFI	✓	✓	1.40 4.21
3	1	ARTR		✓	.96
3	2	CHNA		✓	.75
3	3	CHNA		✓	.75
3	4	CHNA AMAL	✓	✓	.68 3.38
4	1	CHNA	✓		3.50
4	2	JUSC		✓	.54
4	3	AMAL		✓	1.69
4	4	AMAL		✓	4.48

The above data are to be summarized from a series of similar data sheets on data sheet 3C.2.

* If only relative measures of density, frequency, and coverage are desired, then omit this column.

1987 VEGETATION SURVEY

UTAH POWER AND LIGHT COMPANY

RECLAIMED SLOPE AND ASSOCIATED REFERENCE AREA

COTTONWOOD FAN PORTAL

RECLAIMED SLOPE AND ASSOCIATED REFERENCE AREA
COTTONWOOD FAN PORTAL
FINAL RECLAMATION SURVEY

General Background:

Both the Reclaimed slope and its associated Reference area are located in Cottonwood Canyon approximately 9 miles northwest of Orangeville, Utah [see Location Map - Figure 1]. The reclaimed slope encompasses 1.6 acres of land. Both properties are located within federal leased boundaries on the Manti-Lasal National Forest. The elevation range for both properties is between 7,400' and 7,700'.

Planting Methodologies:

The reclaimed slope was planted in 1981. The following methodologies were implemented:

The seed mixture was broadcast at a predetermined rate. The slopes were then hand raked to turn the soil surface. Ammonium nitrate and triple superphosphate fertilizers were spread in the trenches. Container-grown shrubs were transplanted along the trenches.

Conclusions and Recommendations:

Reclaimed Slope - The survey was completed September 28, 1987. The overall appearance of the entire site is excellent. Plant vigor is good with no undesirable species located during the survey. The majority of the species have produced abundant seed and has not been adversely impacted by grazing, insects or rodents. No evidence of erosion is present. Some coal dusting is occurring from the neighboring Trail Mountain Mine facilities.

Reference Area - The survey was completed September 29, 1987. The overall appearance of the entire site is good. Plant vigor is good with no undesirable species located on the site during the survey. No evidence of erosion or adverse impacts from grazing, insects or rodents is present. Although the reference area is located directly above the reclaimed slope, drifting coal dust does not appear to be reaching that elevation.

Comparing Reclaimed With Reference:

The average number of samples per plot containing vegetative cover on the Reclaimed Site is 2.64 and on the Reference site is 1.04. This difference, according to the student-t statistical test, is significant. The average number of woody plants per acre are 551.4 and 617.8 for the reclaimed and reference areas, respectively. The majority of the vegetative cover found within the Reclaimed Slope area consists of herbaceous plant species. The larger well-established woody shrubs located within the reference plot tend to block the sun and utilize water otherwise available to low growing grasses and

forbs. Another way to illustrate this point is by determining productivity. The dried weight for vegetative cover produced during the 1987 growing season is 611.3 pounds per acre for the Reclaimed area and 124.9 pounds per acre for the Reference area.

The survey data indicates no further monitoring of revegetation success on the reclaimed slope is necessary.

Survey results, species list and example of field notes are included as Attachment 21.

ATTACHMENT 21

SEED MIXTURE

FINAL RECLAIMED SLOPE

SCIENTIFIC NAME	COMMON NAME
Grasses	
Agropyron smithii var. Rosanna	Western wheatgrass
Elymus salinaus var. Magnar	Great basin wildrye
Oryzopsis hymenoides var. Paloma	Indian ricegrass
Forbs	
Aster chilensis	Pacific aster
Melilotus officinalis	Yellow sweetclover
Hedysarum boreale	Northern sweetvetch
Seedlings	
Atriplex cuneata	Cuneate saltbush
Artemisia tridentata	Big sagebrush
Chrysothamnus viscidiflorus	Little rabbitbrush
Ephedra viridis	Mormon tea

COMPARISON OF TOTAL VEGETATIVE COVER

	Reclaimed	Reference
Sample Mean [$\bar{x}$]	2.64	1.04
Variance [s^2]	2.76	1.59
Sample Size [n]	50	50

t = 2 tail t at 90% Confidence is 1.66 with df = $[n_1+n_2-2]$.

$$\frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\frac{s_1^2}{n_1} - \frac{s_2^2}{n_2}}} \qquad \frac{2.64 - 1.04}{.055 - .032} = 10.67^*$$

* The obtained t shows a significant difference in the two areas if it is equal to or greater than 1.66.

COMPARISON OF WOODY PLANT DENSITY

	Reclaimed	Reference
Mean point to plant distance [$\bar{x}$]	2.71	2.56
Mean area per woody plant [$\bar{x}^2$]	7.34	6.55
Number of woody plants per acre $\frac{4047M^2/Acre}{[\bar{x}^2]}$	551.4	617.8

SPECIES LIST

FINAL RECLAIMED SLOPE

SYMBOL	SCIENTIFIC NAME	COMMON NAME
AGROP	Agropyron sp.	Wheatgrass
ELCI	Elymus cinereus	Great basin wildrye
AGSMS	Agropyron smithii	Western wheatgrass
AGCR	Agropyron crestatum	Crested wheatgrass
DAGL	Dactylis glomerata	Orchardgrass
HEBO	Hedysarum boreale	Northern sweetvetch
ASCH[2]	Aster chilensis	Pacific aster
ARTR	Artemesia tridentata	Big sage

t-Test at 90% Confidence Level

$$n = \frac{[t]^2\,[s]^2}{[10\%\ \text{mean}]^2}$$

t = 1 tail at 90% confidence is 1.299 with df = 49 [50-1]

Variance = standard deviation squared [s^2] = 2.76

Sample mean [$\bar{x}$] = 2.64

Sample size [n] = 50

Sample size needed for a 90% confidence

$$n = \frac{[1.299]^2\,[\ 2.76\ ]}{.07} = 66.5$$

should be at or below 50 *

* The Final Reclaimed Slope property shows a large amount of variability in vegetative cover. The maximum number of samples required by DOGM [50] is still insufficient in accounting for all variability.

VEGETATIVE COVER

FINAL RECLAIMED SLOPE

Vegetative Cover	25.6%
Undesirables	0%
Desirables	25.6%
AGROP	7.8%
ELCI	13.4%
AGSMS	1.6%
AGCR	0.2%
DAGL	0.2%
HEBO	0.2%
ASCH[2]	1.8%
ARTR	0.4%
Litter	15.2%
Rock	6.6%
Bare Ground	52.6%
TOTAL	100.0%

SPECIES LIST

RECLAIMED SLOPE REFERENCE

SYMBOL	SCIENTIFIC NAME	COMMON NAME
ORHYH	Oryzopsis hymenoides	Indian ricegrass
AGSMS	AGropyron smithii	Western wheatgrass
ERIOG	Eriogonum sp.	
AMAL	Amelanchier alnifolia	Serviceberry
CHNA	Chrysothamnus nauseosus	Rubber rabbitbrush
EPNE	Ephedra nevadensis	Mormon tea
PIED	Pinus edulis	Pinyon pine

t-Test at 90% Confidence Level

$$n = \frac{[t]^2\ [s]^2}{[10\%\ \text{mean}]^2}$$

t = 1 tail at 90% confidence is 1.299 with df = 49 [50-1]

Variance = standard deviation squared [s^2] = 1.59

Sample mean [$\bar{x}$] = 1.04

Sample size [n] = 50

Sample size needed for a 90% confidence

$$n = \frac{[1.299]^2\ [\ 1.59\ ]}{[.011\ ]} = 244$$

should be at or below 50*

*The Reclaimed Slope Reference area shows a large variability in vegetative cover. The maximum number of samples required by DOGM [50] is still insufficient in accounting for all variability.

VEGETATIVE COVER

RECLAIMED SLOPE REFERENCE AREA

Vegetative Cover	9.6%
Undesirables	0%
Desirables	9.6%
ORHYH	0.2%
AGSMS	8.4%
ERIOG	0.2%
AMAL	0.4%
CHNA	0.4%

Litter	22.0%
Rock	27.8%
Bare Ground	40.6%
TOTAL	100.0%

Vegetation Field Notes

Company Name WP+L **Date** 9/28/87

Location Cottonwood/Wilberg Mine **Site** Final Reclaimed Slope **Time** 1545

Magnetic Heading _____ **Transect #** 1

Species vigor and/or % cover. 1 of 3

B	AGTR	B	AGTR	B	L	B	B	R	B
L	B	B	L	B	ELCI	B	R	ELCI	B
ELCI	B	B	ELCI	B	ELCI	B	L	B	B
AGROP	L	B	L	ELCI	B	B	B	B	B
ELCI	HEBO	L	B	B	AGROP	B	B	L	B
AGROP	ELCI	B	B	B	B	B	B	AGROP	B
B	B	B	B	AGROP	B	ELCI	L	AGROP	B
L	L	AGROP	B	B	ELCI	ELCI	ELCI	L	B
B	L	B	AGROP	B	ELCI	B	B	L	B
AGROP	B	AGROP	B	B	AGCR	AGROP	L	L	B
L	B	L	B	B	B	B	B	B	B
AGCR	AGCR	B	L	L	AGSMS	AGSMS	B	L	B
AGROP	L	B	L	B	B	AGCR	B	B	B
B	B	B	B	AGSMS	AGSMS	AGSMS	B	B	B
B	AGROP	R	AGROP	AGROP	B	B	B	R	B
L	B	L	B	AGROP	B	AGROP	B	B	B
B	B	B	B	L	B	B	B	B	B
B	B	B	B	AGSMS	L	L	L	B	B
L	ELCI	ELCI	B	B	B	L	B	B	B
AGROP	L	ELCI	B	B	R	ELCI	L	L	B

Comments & Observations WildRye ELCI AGCR

Vegetation Field Notes

Company Name UP&L Date 9/28/87

Location Cottonwood/Willberg Site Final Reclaimed Slope Time 1545

Magnetic Heading _____ Transect # 1

Species vigor and/or % cover. 2 of 3

B	B	B	B	B	B	L	L	L	B
L	B	R	B	B	AGROP	B	B	B	B
L	B	ELCI	ELCI	R	B	B	ELCI	B	ELCI
B	B	B	AGROP	B	ASCH2	AGROP	AGROP	AGROP	L
B	B	B	B	B	ASCH2	ELCI	ELCI	B	L
B	B	L	Agrop	B	B	B	B	B	ASCH2
B	B	AGSMS	B	B	B	B	B	B	B
B	B	B	AGROP	ARNI	L	B	B	B	B
R	B	B	B	B	B	B	AGROP	AGROP	B
B	B	B	B	B	B	L	L	B	B
B	B	B	B	B	ELCI	B	B	B	B
ELCI	ELCI	AGROP	ELCI	B	R	B	B	B	B
AGROP	ASCH2	ELCI	ASCH2	L	L	ELCI	ELCI	ELCI	B
B	B	B	B	ASCH2	B	B	B	B	B
B	B	B	ELCI	L	ASCH2	L	B	L	AGROP
AGROP	ELCI	ELCI	ELCI	B	AGSMS	L	L	AGROP	B
B	B	B	B	B	L	B	L	L	L
ELCI	ELCI	B	B	B	ELCI	R	R	R	B
R	R	R	R	ELCI	ELCI	ELCI	R	ELCI	R
B	B	AGROP	B	AGROP	L	ELCI	L	L	B

Comments & Observations

Tops of ELSA Grazed

ARNI Black gage

* Man induced

Vegetation dusted w/ Coal

	1	2	3	4	5	6	7	8	9	10
1	ELCI	B	L	ELCI	B	L	L	B	Agrop	ELCI
2	B	B	B	B	R	L	L	B	B	L
3	ELCI	R	B	ELCI	B	B	B	ELCI	B	AGROP
4	ELCI	B	B	ELCI	ELCI	B	B	AGROP	L	B
5	B	R	L	ELCI	ELCI	ELCI	ELCI	E	B	ELCI
6	ELCI	L	B	L	ELCI	ELCI	ELCI	ELCI	ELCI	ELCI
7	ELCI	L	B	L	Agrop	L	ELCI	B	L	B
8	L	L	R	R	R	R	R	R	R	R
9	B	L	Dgl	R	R	R	R	ELCI	R	ELCI
10	Agrop	B	ELCI	B	B	R	B	B	B	B

Data Sheet 3C.1. *Tabulation of Raw Data from Point-Quarter Plant Sampling.*

Date 9/28/87 Observers H. Welker

Habitat and Stratum

Locality ~~Cottonwood/Wilbarger~~ Final Reclaimed Road.

Number of points sampled 1 of 2

Point number	Quadrant number	Species	height 1 ft	height 1-3 ft.	Point-to-plant distance* (m)
1	1	ARTR		√	.32M
1	2	O		—	—
1	3	O		—	—
1	4	ARTR		✓	2.94
2	1	CHNA		✓	7.84M
2	2	AT		✓	.84
2	3	CHNA		✓	2.94
2	4	O		—	—
3	1	CHNA		✓	4.20
3	2	"	✓	✓	.33 3.36
3	3	AT.		✓	4.17
3	4	CHNA	✓		3.08 — Nothing else large
4	1	O	✓		—
4	2	CHNA		✓	2.59
4	3	O	—		—
4	4	O	—		—

The above data are to be summarized from a series of similar data sheets on data sheet 3C.2.

* If only relative measures of density, frequency, and coverage are desired, then omit this column.

Data Sheet 3C.1. *Tabulation of Raw Data from Point-Quarter Plant Sampling.*

Date 9/28/87 Observers H Welker

Habitat and Stratum

Locality Cottonwood/Wilberg - Final Reclaimed Slope

Number of points sampled 2 of 2

Point number	Quadrant number	Species	height 1 ft	height 1-3 ft.	Point-to-plant distance* (m)
1	1	CHNA		✓	.28
1	2	ATCU	✓		2.8 Nothing larger
1	3	O	—		—
1	4	O	—		—
2	1	ARNI		✓	.14
2	2	AT Shadscal		✓	1.52
2	3	CHNA	✓		2.02 nothing larger
2	4	ATCU		✓	3.78
3	1	O		—	—
3	2	O		—	—
3	3	ATCU		✓	2.80
3	4	CHNA		✓	8.84
4	1	AT sh	✓		.56 nothing larger
4	2	AT "	✓		.56 "
4	3	O	—		—
4	4	ATCU		✓	.84

The above data are to be summarized from a series of similar data sheets on data sheet 3C.2.

* If only relative measures of density, frequency, and coverage are desired, then omit this column.

Vegetation Field Notes

Company Name UP&L Date 9/29/87

Location ~~Cottonwood/Willow~~ Site Reclaimed Slope Reference area Time 1005

Magnetic Heading _____ Transect # 1

Species vigor and/or % cover. 1 of 3

B	B	B	B	B	R	R	R	B	B
B	B	B	B	B	ORHY	L	B	B	R
B	B	B	B	B	B	R	B	R	R
B	B	AGSMS	B	B	B	B	B	R	B
B	R	R	B	AGSMS	R	R	R	B	AGSMS
B	L	B	B	B	R	R	B	B	B
R	B	B	B	B	R	R	R	L	L
B	R	B	R	B	B	B	B	B	B
L	L	L	L	L	L	L	L	R	R
L	B	L	L	L	R	R	L	R	L
B	L	L	B	R	B	B	B	L	L
R	L	L	L	L	B	R	R	L	R
B	R	B	B	R	B	R	B	B	B
R	B	L	B	L	R	R	R	R	R
L	B	L	AGSMS	L	AGSMS	AGSMS	AGSM	B	B
B	B	B	L	L	R	R	R	B	L
B	B	L	R	R	ERIOG.	B	AGSMS	B	B
B	B	R	R	R	AGSMS	B	B	L	B
B	B	B	B	R	B	R	R	R	R
R	R	R	B	R	R	B	B	R	R

Comments & Observations AGSM AMAL ERIOG.
ORHY CHNA
PIPI - pinyon Pine Ephedra

Vegetation Field Notes

Company Name UP&L Date 9/29/87

Location Cottonwood/Wilberg Site Reclaimed Slope Reference Area Time 1005

Magnetic Heading _____ Transect # 1

Species vigor and/or % cover. 2 of 3

B	B	R	B	R	B	R	R	R	B
B	L	L	B	L	L	R	B	R	R
L	L	L	B	B	B	B	B	B	B
AGSMS	AGSMS	R	B	B	R	B	L	R	R
B	B	B	B	B	AGSMS	AGSMS	AGSM	AGSMS	L
B	AGSMS	B	B	B	R	R	R	R	B
B	R	B	R	B	AGSMS	AGSMS	AGSMS	L	B
L	L	R	AGSM	R	AGSMS	L	AGSMS	R	R
R	R	R	R	R	R	R	R	R	R
L	L	B	L	B	L	L	R	L	B
L	L	L	L	R	L	L	R	L	B
L	L	L	L	B	L	R	R	R	L
L	AGSMS	AGSM	R	L	R	R	L	L	L
R	L	L	L	L	L	L	L	L	L
AGSMS	L	L	L	L	L	L	L	L	L
L	B	B	R	B	L	AGSMS	R	L	AGSM
L	L	L	AGSMS	B	R	R	R	R	R
R	R	B	L	B	L	B	B	L	AGSMS
AGSMS	L	L	R	B	AGSMS	R	R	B	B
R	R	B	R	B	R	R	R	R	B

40

Comments & Observations

Little wildlife use Sign. Site is extremely steep Some coal dusting but nearly as much as reclaimed slope.

Vegetation Field Notes

Company Name UP&L Date 9/29/87

Location ~~Cottonwood/Wilberg~~ Site Reclaimed Slope Reference Area Time 1005

Magnetic Heading _____ Transect # 1

Species vigor and/or % cover. 3 of 3

~~CHNA~~	R	R	B	B	B	B	B	~~AGSMS~~	L
B	B	~~AGSMS~~	B	R	AGSMS	AGSMS	AGSMS	L	R
B	R	R	B	B	R	R	B	R	AGSMS
B	B	B	B	R	L	B	B	B	B
B	AGSMS	~~AGSM~~	~~AGSM~~	R	B	B	B	B	B
R	B	B	R	R	B	B	R	R	R
B	B	R	R	~~AGSMS~~	~~AGSMS~~	R	B	R	B
EP	L	L	AGSM	L	L	B	B	B	L
B	R	R	R	B	B	L	B	B	B
B	AMAL	AMAL	B	CHNA	~~AGSM~~	B	B	B	B

Comments & Observations _____

Data Sheet 3C.1. *Tabulation of Raw Data from Point-Quarter Plant Sampling.*

Date 9/29/87 Observers H. Walker

Habitat and Stratum

Locality Mod L Cottonwood/Wilberg Reference area for Reclaimed Slop

Number of points sampled 1 of 2

Point number	Quadrant number	Species	height 1 ft	height 1-3 ft.	Point-to-plant distance* (m)
1	1	PI		✓	1.0M
1	2	AMAL		✓	3.82
1	3	JU		✓	3.79
1	4	AMAL		✓	1.98
2	1	JUMO		✓	1.49
2	2	AMAL		✓	4.21
2	3	* other real fine JU		✓	.74
2	4	PI		✓	3.18
3	1	PI		✓	4.23
3	2	EP		✓	1.20
3	3	PI		✓	2.22
3	4	CHNA		✓	1.12
4	1	JU		✓	.32.
4	2	PI		✓	2.11
4	3	CHNA		✓	3.97
4	4	AMAL AMAL	✓	✓	4.67 2.99

The above data are to be summarized from a series of similar data sheets on data sheet 3C.2.

* If only relative measures of density, frequency, and coverage are desired, then omit this column.

Data Sheet 3C.1. *Tabulation of Raw Data from Point-Quarter Plant Sampling.*

Date 9/29/88 Observers L. Walker

Habitat and Stratum

Locality ~~Cottonwood~~ Wilberg Reclaimed Slope Reference area

Number of points sampled 20

Point number	Quadrant number	Species	height 1 ft	height 1-3 ft.	Point-to-plant distance* (m)
1	1	AMAL		✓	1.09
1	2	AMAL		✓	3.72
1	3	CHNA AMAL	✓ ✓		1.5 5.03
1	4	AMAL AMAL	✓	✓	2.00 4.36
2	1	CHNA		✓	.69
2	2	AMAL		✓	2.49
2	3	CHNA		✓	1.03
2	4	PI		✓	3.86
3	1	JU		✓	.63
3	2	AMAL		✓	1.97
3	3	EP.		✓	1.27
3	4	CHNA		✓	3.47
4	1	EP		✓	2.03
4	2	EP		✓	2.31
4	3	AMAL		✓	2.17
4	4	JU		✓	6.73

The above data are to be summarized from a series of similar data sheets on data sheet 3C.2.

* If only relative measures of density, frequency, and coverage are desired, then omit this column.