

**Report of Findings
Revegetation Assessment
Rocky Flats Site
Jefferson County, CO**

Prepared for:

U.S. Environmental Protection Agency
Region 8
Denver, CO

Prepared by:

ESCO Associates Inc.
P.O. Box 18775
Boulder, CO 80308

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INTRODUCTION

In mid-September, 2010, ESCO Associates conducted on-site measurement of vegetation resulting from reseeding efforts at the Rocky Flats Site (formerly known as Rocky Flats Environmental Technology Site) made during closure activities in 2004 and 2005. These measurements constitute a quantitative evaluation of the viability of vegetation along representative sample transects located in areas that have had five full growing seasons since initial seeding. The results are the basis of the discussion below.

METHODS

Areas where revegetation was five or more years old were sampled on the Rocky Flats site in 2010. These areas included various portions of the 903 pad lip area (Revegetation parcels 18, 32, 33* (see map in Appendix Four) and the immediate vicinity of surface water monitoring location GS51). In addition, as in 2009, a Comparison Area near the Rocky Flats site was sampled to provide evidence of vegetational performance under revegetation conditions with similar substrate and climate but with longer elapsed time since seeding. At each of the RFS areas, sample transects (see below) were placed so as to reflect conditions deemed (visually) representative of generally prevailing conditions in that area. For purposes of comparison, an area that was revegetated in the mid-1990's, located a short distance to the north of the Rocky Flats sites, was also sampled. This comparison area was mined for gravel; the revegetation efforts took place on coarse cobbly alluvium similar in overall texture to most of the materials used as growth media on the Rocky Flats Site. This area, known as the Jenkins Pit, is now included on City of Boulder Open Space and Mountain Parks (OSMP) Varra property. OSMP cooperation in allowing access was appreciated. Three sampling transects were placed for monitoring purposes at the Jenkins Pit area in 2003 (when it was about seven years old; it is now about 14 years old).

At each sample site, cover data were collected using a point-intercept method in which data are tabulated as interceptions of a very fine and rigidly projected point with a plant species, bare ground, litter, standing dead, or rock. The cover sampling points were optically projected using a Cover-Point Optical Point Projection Device. Sampling occurred along randomly located and randomly oriented 50m belt transects. Along each transect, 100 points were systematically spaced at a rate of 2 points per meter. Of the pair of points projected at each meter, one was projected at a distance 50 cm to the right

of the tape, and the other was projected 50 cm to the left of the tape in areas not disturbed by the extension of the tape. Litter was considered to be any organic material that had fallen, to the soil surface. Standing dead was any dead plant material that was produced in previous years but was still standing and had not lodged or broken off to become litter. In addition to "first hit" data (the first interception of any of the above materials as a point is projected from above), "additional hit" data (any additional live species intercepted between the first hit and the ground) were collected. First hit interceptions were used to calculate absolute top layer (first hit) foliar cover by dividing the number of interceptions for a particular species or material by the total number of points taken (100). First hit relative vegetation cover was calculated by dividing first hit absolute cover for each species by the total first hit vegetation cover. All-layer absolute cover was calculated by dividing all hits for particular species by the total number of points taken (100). In addition, all-layer relative cover was calculated using all hits for particular species divided by the total vegetation hits accumulated during sampling of the transect.

Three transects were placed in revegetation parcel 32 (including one in the immediate vicinity of monitoring site GS51) and one transect was placed in each area 18 and 33. UTM coordinates (NAD 83) are provided below:

AREA	TRANSECT	UTM DATA (13S)	
		ORIGIN	END
32	1	0483609 4415403	0483642 4415441
32	2	0483440 4415452	0483400 4415421
32	GS51	0483490 4415332	0483538 4415349
18	1	0483207 4415447	0483169 4415479
33	1	0483025 4415485	0482974 4415486

RESULTS

Quantitative field data collected are presented in Tables A through E in Appendix One. Photographs of the sampled sites are present in Appendix Two. Data are summarized in the table below in light of discussion points identified during the process of study plan development. Average values are compared in the table below to the average of the three transects at the Comparison Site.

Summary of Quantitative Revegetation Measurements – Rocky Flats Site, Sept. 2010

Revegetation Comparison Criteria	Comparison Area	Area 32*	Area 18	Area 33	Vicinity of GS51 (Area 32)
% Absolute Cover: Total Live	51.0%	45.7%	36.0%	27.0%	52.0%
% Absolute Cover: Desirable Species	28.4%	39.3%	31.0%	27.0%	47.0%
% Relative Cover: Desirable Species	55.7%	86.0%	86.1%	100%	90.4%
% Absolute Cover: Noxious Weeds	3.0%	1.3%	0.0%	0.0%	0.0%
% Absolute Cover: Weeds**	25.3%	6.4%	5.0%	0.0%	5.0%
% of Seeded Species Present	NA [‡]	100%**	72.7%***	54.5%***	85.7%**
% Relative Cover: Most Abundant Single Species	22.9%	32.9%	50.0%	48.2%	53.9%
% Total Ground Cover	78.7%	81.0%	69.0%	74.0%	89.0%

*Includes transect at GS51** Weeds in the sense of all plants not in the seed mix or other desirable native perennials.

** Based on “DOE “Hillside Slope Areas” seed mix (Appendix Three)

*** Based on DOE “Flat Areas” seed mix (Appendix Three)

‡ NA = Comparison Area not seeded with Rocky Flats Mixes

DISCUSSION

In the discussion below, criteria for revegetation success are either those set forth in an EPA document titled “Revegetation Success Criteria – Rocky Flats Environmental Technology Site” produced in 2004, or those criteria included in the DOE Revegetation Plan for the Rocky Flats Environmental Technology Site dated 1/20/04.

Area 32 (Photos 1-3, Table A)

The average from three samples indicated that absolute cover by current year’s vegetation growth was 45.7%, well in excess of that of the level of 25% set forth in proposed EPA criteria for revegetation success on the Rocky Flats site formulated in 2004. Total ground cover of 81% was likewise well in excess of the 60% level set forth in the Quantitative Grassland Success Criteria included in the DOE Revegetation Plan and also exceeded the level in the Comparison Area. Relative cover by desirable species was 86.0% far exceeding the 30% DOE criterion.

All seeded species were documented as present in the Area 32 samples. This exceeds (and thus satisfies) the 50% DOE criterion. The average relative cover by the single most abundant species was 32.9% of the total vegetation cover. As such it meets (by being less than) the DOE criterion of 45% of cover comprised by a single species. The single most abundant species were sideoats grama (*Bouteloua curtipendula*) in two samples and western wheatgrass (*Pascopyrum smithii*) in the third.

With regard to noxious weeds, the only species quantitatively encountered in Area 32 were diffuse knapweed (*Centaurea diffusa*) and Canada thistle (*Cirsium arvense*). Their average abundance over the three samples was 1.3%, a level that is assigned a “Conditional Pass” in the 2004 EPA Revegetation Success Criteria. DOE has continued to pursue the eradication of noxious weeds on the site. Overall the site does not give evidence of being overwhelmed by weeds, and the very moist conditions of 2009/2010 have given weeds like knapweed and Canada thistle the opportunity to proliferate. The Area 32 site is south-facing and by its nature, susceptible to dry conditions that may

prevent the planted species from exercising their capacity to out-compete short-lived species like knapweed. Deep-rooted perennials like Canada thistle are very difficult to eradicate and are likely to remain threats or re-occur even after the most persistent attempts to remove them. On-going DOE efforts to accomplish removal of Canada thistle are believed to be adequate, though it may be necessary to continue these efforts for the foreseeable future.

Area 32 – GS51 Area (*Photo 3, Table B*)

Vegetation of the area in the immediate vicinity of surface water monitoring point GS51 was sampled as part of Sampling of Area 32 reported above. To the extent that conditions around this monitoring point are of special interest, this sample is separated out for report here. Total live vegetation cover by desirable species was 52%, highest of all Rocky Flats site samples. This far exceeds the 25% EPA 2004 criterion and it also exceeds the Comparison Area average of 28%. Relative cover by desirable species was 90.4%, far in excess of the DOE criterion of 30%.

Approximately 85% of seeded species were present, exceeding the DOE criterion. The single most abundant species (sideoats grama) comprised just over half of the total vegetation cover. Thus it somewhat exceeded the 45% DOE criterion. As with some other areas discussed here, the modest overage on this measure is not thought in any way to represent a problem now or in the future.

No noxious weeds were encountered in the GS51 sample.

Area 18 (*Photo 4, Table C*)

Area 18 had 36% live vegetation cover, exceeding the 25% EPA success criterion. With over 86% relative cover by desirable species, it far exceeds the DOE criterion of 30%. Total ground cover of 69% is essentially even with the 70% criterion of DOE. With approximately 73% of seeded species present, the 50% DOE criterion is well exceeded. The single sample showed that western wheatgrass comprised half of the cover, and though slightly in excess of the 45% DOE criterion, it is not likely that this represents a problem situation. Many native stands on finer-textured soils “naturally” have as much

western wheatgrass as is present here, or more. It is thought likely that the relative abundance of western wheatgrass will decrease, at least somewhat, as the stand matures.

Area 33 (Photo 5; Table D)

Total absolute vegetation cover by desirable species of 27% in Area 33 exceeds the level of 25% level of the EPA success criterion. 100% of the cover was comprised of desirable species, easily exceeding the DOE criterion of 30%. Total ground cover of 74% is well above the 60% DOE criterion.

Over 50% percent of seeded species are present, satisfying the DOE criterion. The single most abundant species (*Pascopyrum smithii*) comprises 48.2% of vegetation cover, only slightly exceeding the goal of 45% cited in the DOE Reclamation Plan.

Diffuse knapweed was the only Colorado A or B list noxious species encountered in the sampling at the Solar Pond area and it was not abundant enough to have been encountered quantitatively.

Appearance of the Comparison Area is documented in Photos 6 through 8; data from the sampling of this area are presented in Table E.

SUMMARY

Total Vegetation Cover

The moist winter and spring of 2009/2010 provided favorable conditions for high cover values, both on the Rocky Flats site and the Comparison Area. As a result, high values were observed nearly everywhere. Even the comparatively low cover of Area 33 (Photo 5) exceeded the 25% criterion. In that area, the comparative lack of soil fines may limit the cover on a long-term basis. The surface is nearly level and erosion hazard is low.

Total Ground Cover

With all revegetation sites near or above 70% total ground cover, erosional protection can be regarded as satisfactory. During dry times, vegetational cover will of course decline, but in consideration of the extent of rocks at the surface, ground cover on the sites can be expected to continue to be greater than grasslands on finer-textured soils.

Percent of Seeded Species Present

Of sites examined in 2010, over half the seeded species were represented on all. With regard to species density (not a specified performance standard) the Area 32 samples averaged 23 species per 100 sq.m., exceeding the Comparison Area (19.3 species per 100 sq.m.) and very comparable to the values on the Present Landfill observed in 2009 (22 species per 100 sq.m.; see 2009 report). Lower numbers on areas 18 (18 species per 100 sq.m.) and 33 (10 species per 100 sq.m.) probably reflect substrate severity. Note that in the long-term, these sites are likely to be more diverse than sites with “better” soils, but this may be the work of decades if not centuries.

Dominance by Single Species

Relative proportion of cover among species is likely to continue to vary in response to varying moisture conditions as well as competitive interaction at all of the revegetated sites. At present, all are possessed of a single species that is particularly successful so that approximately half the vegetation cover is comprised of that species. But as time proceeds, it is likely that a process of shake-down or settling that has been observed elsewhere will result in a progressively more stable and equitable division of abundance. It is worth note that in the Comparison Area (approximately 13 to 16 years since seeding), the single most abundant species now comprises about 20% of the vegetation cover.

Presence of Weeds

DOE Legacy Management has pursued weed control very vigorously over the five years since seeding. As a result the presence of noxious weeds is very low. 2010 had a wet spring that promoted the germination of some annual/biennial weeds such as diffuse knapweed. Lingering deep-rooted perennial weeds such as Dalmatian toadflax and Canada thistle are likewise encouraged by high moisture. Thus 2010 was a “bad” year for weeds (as was 2009) and their limited presence this year is testament to previous

control efforts. Continuing weed control is a fact of life. As vegetation strength develops and during drier years, weed problems can be expected to be less extensive.

Appendix One.

Quantitative Data Tables by Sample Area and Transect

(See attached spreadsheet files)

Appendix Two

Photographs of Sample Locations

(See attached document)

Appendix Three.

Seed Mixes used

(See attached two documents)

Appendix Four.

Revegetation Parcel Map

(See attached map)

Table A. Cover Data - Rocky Flats Area 32, Sept. 2010

PLANT SPECIES	AVERAGE		RELATIVE VEGETATION		RELATIVE VEGETATION	
	COVER (%)	FREQUENCY (%)	COVER (%)	COVER-ALL (%)	COVER-ALL (%)	COVER-ALL (%)
NATIVE ANNUAL & BIENNIAL FORBS						
<i>Grindelia squarrosa</i>	0.33	100.00	0.73	0.67	1.44	
<i>Helianthus annuus</i>	0.00	100.00	0.00	0.00	0.00	
TOTAL NATIVE ANN. & BIEN. FORBS	0.3	100.0	0.7	0.7	1.4	
INTRODUCED ANNUAL & BIENNIAL FORBS						
<i>Acosta diffusa</i>	0.33	66.67	0.73	0.33	0.72	
<i>Alyssum parviflorum</i>	0.00	66.67	0.00	0.00	0.00	
<i>Bassia sieversiana</i>	0.00	33.33	0.00	0.00	0.00	
<i>Lactuca serriola</i>	0.00	66.67	0.00	0.00	0.00	
<i>Melilotus alba</i>	0.33	66.67	0.73	0.33	0.72	
<i>Tragopogon dubius</i> ssp. <i>major</i>	0.00	33.33	0.00	0.00	0.00	
<i>Verbascum thapsus</i>	0.00	66.67	0.00	0.00	0.00	
TOTAL INTRO. ANN. & BIEN. FORBS	0.7	100.0	1.5	0.7	1.4	
INTRODUCED ANNUAL GRASSES						
<i>Anisantha tectorum</i>	0.00	66.67	0.00	0.00	0.00	
<i>Bromus japonicus</i>	0.67	100.00	1.46	0.67	1.44	
TOTAL INTRO. ANN. GRASSES	0.7	100.0	1.5	0.7	1.4	
NATIVE PERENNIAL FORBS						
<i>Ambrosia psilostachya</i> var. <i>coronopifolia</i>	0.00	33.33	0.00	0.00	0.00	
<i>Aster porteri</i>	0.00	33.33	0.00	0.00	0.00	
<i>Heterotheca villosa</i>	0.33	66.67	0.73	0.33	0.72	
<i>Liatris punctata</i>	0.00	33.33	0.00	0.00	0.00	
<i>Lithospermum ruderale</i>	0.00	33.33	0.00	0.00	0.00	
<i>Phyla cuneifolia</i>	0.00	66.67	0.00	0.00	0.00	
<i>Psoralidium tenuiflorum</i>	0.00	66.67	0.00	0.00	0.00	
<i>Sphaeralcea coccinea</i>	0.00	33.33	0.00	0.00	0.00	
TOTAL NATIVE PERENNIAL FORBS	0.3	100.0	0.7	0.3	0.7	
INTRODUCED PERENNIAL FORBS						
<i>Breea arvensis</i>	1.00	33.33	2.19	1.00	2.16	
<i>Convolvulus arvensis</i>	0.33	33.33	0.73	0.33	0.72	
<i>Linum perenne</i>	0.00	33.33	0.00	0.00	0.00	
TOTAL INTRO. PERENNIAL FORBS	1.3	66.7	2.9	1.3	2.9	
NATIVE PERENNIAL GRASSES (cool)						
<i>Elymus lanceolatus</i> fm. <i>dasystachya</i>	0.67	33.33	1.46	0.67	1.44	
<i>Elymus trachycaulus</i>	0.67	100.00	1.46	0.67	1.44	
<i>Juncus longistylis</i>	0.00	33.33	0.00	0.00	0.00	
<i>Nassella viridula</i>	1.33	66.67	2.92	1.33	2.88	
<i>Pascopyrum smithii</i>	10.67	100.00	23.36	10.67	23.02	
<i>Poa compressa</i>	1.00	66.67	2.19	1.00	2.16	
<i>Poa pratensis</i> ssp. <i>agassizensis</i>	0.33	100.00	0.73	0.33	0.72	
TOTAL NATIVE PERENNIAL GRASSES (c)	14.7	100.0	32.1	14.7	31.7	
INTRODUCED PERENNIAL GRASSES (cool)						
<i>Agropyron desertorum</i>	0.00	33.33	0.00	0.00	0.00	
<i>Bromopsis inermis</i>	3.67	66.67	8.03	4.00	8.63	
TOTAL INTRO. PERENNIAL GRASSES (c)	3.7	66.7	8.0	4.0	8.6	
NATIVE PERENNIAL GRASSES (warm)						
<i>Andropogon gerardii</i>	0.67	33.33	1.46	0.67	1.44	
<i>Bouteloua curtipendula</i>	15.00	100.00	32.85	15.00	32.37	
<i>Buchloe dactyloides</i>	2.00	100.00	4.38	2.00	4.32	
<i>Chondrosum gracile</i>	5.00	100.00	10.95	5.00	10.79	
<i>Sporobolus asper</i>	1.00	66.67	2.19	1.00	2.16	
<i>Sporobolus heterolepis</i>	0.00	33.33	0.00	0.00	0.00	
TOTAL NATIVE PERENNIAL GRASSES (w)	23.7	100.0	51.8	23.7	51.1	

Table A. Cover Data - Rocky Flats Area 32, Sept. 2010

PLANT SPECIES	AVERAGE		RELATIVE		RELATIVE	
	COVER (%)	FREQUENCY (%)	VEGETATION COVER (%)	AVERAGE COVER-ALL (%)	VEGETATION COVER-ALL (%)	
AGAVOIDS						
Yucca glauca	0.33	33.33	0.73	0.33	0.72	
TOTAL AGAVOIDS	0.3	33.3	0.7	0.3	0.7	
Standing dead	5.00	100.00		5.00		
Litter	26.00	100.00		26.00		
Bare soil	19.00	100.00		19.00		
Rock	4.33	100.00		4.33		
TOTALS	100.0			100.7		
TOTAL VEGETATION COVER	45.7 (s=6.5)		100.0	46.3 (s=6.0)	100.0	
GROUND COVER (Litter+Rock+Veg+St.Dead)	81.0			81.7		
SPECIES DENSITY (# of species/100 sq.m.) (AVERAGE= 23.0 Std.Dev.= 2.0)						

Table A. Cover Data - Rocky Flats Area 32, Sept. 2010

PLANT SPECIES	Percent Foliar Cover		
	Sample Number		
	GS51	32-1	32-2
NATIVE ANNUAL & BIENNIAL FORBS			
<i>Grindelia squarrosa</i>	P	P	1(1)
<i>Helianthus annuus</i>	P	P	P
TOTAL NATIVE ANN. & BIEN. FORBS	P	P	1(1)
INTRODUCED ANNUAL & BIENNIAL FORBS			
<i>Acosta diffusa</i>		P	1
<i>Alyssum parviflorum</i>	P		P
<i>Bassia sieversiana</i>			P
<i>Lactuca serriola</i>	P		P
<i>Melilotus alba</i>		1	P
<i>Tragopogon dubius</i> ssp. <i>major</i>	P		
<i>Verbascum thapsus</i>	P		P
TOTAL INTRO. ANN. & BIEN. FORBS	P	1	1
INTRODUCED ANNUAL GRASSES			
<i>Anisantha tectorum</i>	P	P	
<i>Bromus japonicus</i>	1	P	1
TOTAL INTRO. ANN. GRASSES	1	P	1
NATIVE PERENNIAL FORBS			
<i>Ambrosia psilostachya</i> var. <i>coronopifolia</i>		P	
<i>Aster porteri</i>			P
<i>Heterotheca villosa</i>	1	P	
<i>Liatris punctata</i>		P	
<i>Lithospermum ruderale</i>		P	
<i>Phyla cuneifolia</i>	P	P	
<i>Psoralidium tenuiflorum</i>	P	P	
<i>Sphaeralcea coccinea</i>	P		
TOTAL NATIVE PERENNIAL FORBS	1	P	P
INTRODUCED PERENNIAL FORBS			
<i>Breea arvensis</i>		3	
<i>Convolvulus arvensis</i>	1		
<i>Linum perenne</i>	P		
TOTAL INTRO. PERENNIAL FORBS	1	3	---
NATIVE PERENNIAL GRASSES (cool)			
<i>Elymus lanceolatus</i> fm. <i>dasystachya</i>			2
<i>Elymus trachycaulus</i>	P	P	2
<i>Juncus longistylis</i>			P
<i>Nassella viridula</i>	3	1	
<i>Pascopyrum smithii</i>	6	1	25
<i>Poa compressa</i>		2	1
<i>Poa pratensis</i> ssp. <i>agassizensis</i>	P	P	1
TOTAL NATIVE PERENNIAL GRASSES (c)	9	4	31
INTRODUCED PERENNIAL GRASSES (cool)			
<i>Agropyron desertorum</i>	P		
<i>Bromopsis inermis</i>	3	8(1)	
TOTAL INTRO. PERENNIAL GRASSES (c)	3	8(1)	---
NATIVE PERENNIAL GRASSES (warm)			
<i>Andropogon gerardii</i>	2		
<i>Bouteloua curtipendula</i>	28	15	2
<i>Buchloe dactyloides</i>	P	3	3
<i>Chondrosum gracile</i>	6	4	5
<i>Sporobolus asper</i>		1	2
<i>Sporobolus heterolepis</i>			P
TOTAL NATIVE PERENNIAL GRASSES (w)	36	23	12

Table A. Cover Data - Rocky Flats Area 32, Sept. 2010

PLANT SPECIES	Percent Foliar Cover		
	Sample Number		
	GS51	32-1	32-2
AGAVOIDS			
Yucca glauca	1		
TOTAL AGAVOIDS	1	---	---
Standing dead	8	2	5
Litter	27	24	27
Bare soil	11	29	17
Rock	2	6	5
TOTALS	100	100	100
TOTAL VEGETATION COVER	52	39(1)	46(1)
GROUND COVER (Litter+Rock+Veg+St.Dead)	89	71(1)	83(1)
SPECIES DENSITY (# of species/100 sq.m.) (AVERAGE= 23.0 Std.Dev.= 2.0)	25	23	21

Table B. Cover Data - Rocky Flats GS51 Area, Sept. 2010

PLANT SPECIES	AVERAGE		RELATIVE	RELATIVE	
	COVER (%)	FREQUENCY (%)	VEGETATION COVER (%)	AVERAGE COVER-ALL (%)	VEGETATION COVER-ALL (%)
NATIVE ANNUAL & BIENNIAL FORBS					
<i>Grindelia squarrosa</i>	0.00	100.00	0.00	0.00	0.00
<i>Helianthus annuus</i>	0.00	100.00	0.00	0.00	0.00
TOTAL NATIVE ANN. & BIEN. FORBS	0.0	100.0	0.0	0.0	0.0
INTRODUCED ANNUAL & BIENNIAL FORBS					
<i>Alyssum parviflorum</i>	0.00	100.00	0.00	0.00	0.00
<i>Lactuca serriola</i>	0.00	100.00	0.00	0.00	0.00
<i>Tragopogon dubius</i> ssp. <i>major</i>	0.00	100.00	0.00	0.00	0.00
<i>Verbascum thapsus</i>	0.00	100.00	0.00	0.00	0.00
TOTAL INTRO. ANN. & BIEN. FORBS	0.0	100.0	0.0	0.0	0.0
INTRODUCED ANNUAL GRASSES					
<i>Anisantha tectorum</i>	0.00	100.00	0.00	0.00	0.00
<i>Bromus japonicus</i>	1.00	100.00	1.92	1.00	1.92
TOTAL INTRO. ANN. GRASSES	1.0	100.0	1.9	1.0	1.9
NATIVE PERENNIAL FORBS					
<i>Heterotheca villosa</i>	1.00	100.00	1.92	1.00	1.92
<i>Phyla cuneifolia</i>	0.00	100.00	0.00	0.00	0.00
<i>Psoralegium tenuiflorum</i>	0.00	100.00	0.00	0.00	0.00
<i>Sphaeralcea coccinea</i>	0.00	100.00	0.00	0.00	0.00
TOTAL NATIVE PERENNIAL FORBS	1.0	100.0	1.9	1.0	1.9
INTRODUCED PERENNIAL FORBS					
<i>Convolvulus arvensis</i>	1.00	100.00	1.92	1.00	1.92
<i>Linum perenne</i>	0.00	100.00	0.00	0.00	0.00
TOTAL INTRO. PERENNIAL FORBS	1.0	100.0	1.9	1.0	1.9
NATIVE PERENNIAL GRASSES (cool)					
<i>Elymus trachycaulus</i>	0.00	100.00	0.00	0.00	0.00
<i>Nassella viridula</i>	3.00	100.00	5.77	3.00	5.77
<i>Pascopyrum smithii</i>	6.00	100.00	11.54	6.00	11.54
<i>Poa pratensis</i> ssp. <i>agassizensis</i>	0.00	100.00	0.00	0.00	0.00
TOTAL NATIVE PERENNIAL GRASSES (c)	9.0	100.0	17.3	9.0	17.3
INTRODUCED PERENNIAL GRASSES (cool)					
<i>Agropyron desertorum</i>	0.00	100.00	0.00	0.00	0.00
<i>Bromopsis inermis</i>	3.00	100.00	5.77	3.00	5.77
TOTAL INTRO. PERENNIAL GRASSES (c)	3.0	100.0	5.8	3.0	5.8
NATIVE PERENNIAL GRASSES (warm)					
<i>Andropogon gerardii</i>	2.00	100.00	3.85	2.00	3.85
<i>Bouteloua curtipendula</i>	28.00	100.00	53.85	28.00	53.85
<i>Buchloe dactyloides</i>	0.00	100.00	0.00	0.00	0.00
<i>Chondrosum gracile</i>	6.00	100.00	11.54	6.00	11.54
TOTAL NATIVE PERENNIAL GRASSES (w)	36.0	100.0	69.2	36.0	69.2

Table B. Cover Data - Rocky Flats GS51 Area, Sept. 2010

PLANT SPECIES	AVERAGE COVER (%)	FREQUENCY (%)	RELATIVE VEGETATION COVER (%)	AVERAGE COVER-ALL (%)	RELATIVE VEGETATION COVER-ALL (%)
AGAVOIDS					
Yucca glauca	1.00	100.00	1.92	1.00	1.92
TOTAL AGAVOIDS	1.0	100.0	1.9	1.0	1.9
Standing dead	8.00	100.00		8.00	
Litter	27.00	100.00		27.00	
Bare soil	11.00	100.00		11.00	
Rock	2.00	100.00		2.00	
TOTALS	100.0			100.0	
TOTAL VEGETATION COVER	52.0 (s=0.0)		100.0	52.0 (s=0.0)	100.0
GROUND COVER (Litter+Rock+Veg+St.Dead)	89.0			89.0	
SPECIES DENSITY (# of species/100 sq.m.) (AVERAGE= 25.0 Std.Dev.= 0.0)					

Table B. Cover Data - Rocky Flats GS51 Area, Sept. 2010

PLANT SPECIES	Percent Foliar Cover Sample Number GS51
NATIVE ANNUAL & BIENNIAL FORBS	
<i>Grindelia squarrosa</i>	P
<i>Helianthus annuus</i>	P
TOTAL NATIVE ANN. & BIEN. FORBS	P
INTRODUCED ANNUAL & BIENNIAL FORBS	
<i>Alyssum parviflorum</i>	P
<i>Lactuca serriola</i>	P
<i>Tragopogon dubius</i> ssp. <i>major</i>	P
<i>Verbascum thapsus</i>	P
TOTAL INTRO. ANN. & BIEN. FORBS	P
INTRODUCED ANNUAL GRASSES	
<i>Anisantha tectorum</i>	P
<i>Bromus japonicus</i>	1
TOTAL INTRO. ANN. GRASSES	1
NATIVE PERENNIAL FORBS	
<i>Heterotheca villosa</i>	1
<i>Phyla cuneifolia</i>	P
<i>Psoralidium tenuiflorum</i>	P
<i>Sphaeralcea coccinea</i>	P
TOTAL NATIVE PERENNIAL FORBS	1
INTRODUCED PERENNIAL FORBS	
<i>Convolvulus arvensis</i>	1
<i>Linum perenne</i>	P
TOTAL INTRO. PERENNIAL FORBS	1
NATIVE PERENNIAL GRASSES (cool)	
<i>Elymus trachycaulus</i>	P
<i>Nassella viridula</i>	3
<i>Pascopyrum smithii</i>	6
<i>Poa pratensis</i> ssp. <i>agassizensis</i>	P
TOTAL NATIVE PERENNIAL GRASSES (c)	9
INTRODUCED PERENNIAL GRASSES (cool)	
<i>Agropyron desertorum</i>	P
<i>Bromopsis inermis</i>	3
TOTAL INTRO. PERENNIAL GRASSES (c)	3
NATIVE PERENNIAL GRASSES (warm)	
<i>Andropogon gerardii</i>	2
<i>Bouteloua curtipendula</i>	28
<i>Buchloe dactyloides</i>	P
<i>Chondrosum gracile</i>	6
TOTAL NATIVE PERENNIAL GRASSES (w)	36

Table B. Cover Data - Rocky Flats GS51 Area, Sept. 2010

PLANT SPECIES	Percent Foliar Cover Sample Number GS51
AGAVOIDS	
Yucca glauca	1
TOTAL AGAVOIDS	1
Standing dead	8
Litter	27
Bare soil	11
Rock	2
TOTALS	100
TOTAL VEGETATION COVER	52
GROUND COVER (Litter+Rock+Veg+St.Dead)	89
SPECIES DENSITY (# of species/100 sq.m.) (AVERAGE= 25.0 Std.Dev.= 0.0)	25

Table C. Cover Data - Rocky Flats Area 18, Sept. 2010

PLANT SPECIES	AVERAGE COVER (%)	FREQUENCY (%)	RELATIVE VEGETATION COVER (%)	AVERAGE COVER-ALL (%)	RELATIVE VEGETATION COVER-ALL (%)
NATIVE ANNUAL & BIENNIAL FORBS					
<i>Grindelia squarrosa</i>	0.00	100.00	0.00	0.00	0.00
<i>Helianthus annuus</i>	0.00	100.00	0.00	0.00	0.00
TOTAL NATIVE ANN. & BIEN. FORBS	0.0	100.0	0.0	0.0	0.0
INTRODUCED ANNUAL & BIENNIAL FORBS					
<i>Acosta diffusa</i>	0.00	100.00	0.00	0.00	0.00
<i>Alyssum parviflorum</i>	0.00	100.00	0.00	0.00	0.00
<i>Lactuca serriola</i>	0.00	100.00	0.00	0.00	0.00
<i>Melilotus alba</i>	2.00	100.00	5.56	2.00	5.56
<i>Podospermum laciniatum</i>	0.00	100.00	0.00	0.00	0.00
<i>Verbascum thapsus</i>	3.00	100.00	8.33	3.00	8.33
TOTAL INTRO. ANN. & BIEN. FORBS	5.0	100.0	13.9	5.0	13.9
NATIVE PERENNIAL GRASSES (cool)					
<i>Elymus lanceolatus</i> fm. <i>dasystachya</i>	1.00	100.00	2.78	1.00	2.78
<i>Elymus trachycaulus</i>	4.00	100.00	11.11	4.00	11.11
<i>Koeleria macrantha</i>	0.00	100.00	0.00	0.00	0.00
<i>Nassella viridula</i>	1.00	100.00	2.78	1.00	2.78
<i>Pascopyrum smithii</i>	18.00	100.00	50.00	18.00	50.00
TOTAL NATIVE PERENNIAL GRASSES (c)	24.0	100.0	66.7	24.0	66.7
INTRODUCED PERENNIAL GRASSES (cool)					
<i>Bromopsis inermis</i>	0.00	100.00	0.00	0.00	0.00
<i>Setaria viridis</i>	0.00	100.00	0.00	0.00	0.00
TOTAL INTRO. PERENNIAL GRASSES (c)	0.0	100.0	0.0	0.0	0.0
NATIVE PERENNIAL GRASSES (warm)					
<i>Andropogon gerardii</i>	0.00	100.00	0.00	0.00	0.00
<i>Buchloe dactyloides</i>	2.00	100.00	5.56	2.00	5.56
<i>Chondrosom gracile</i>	5.00	100.00	13.89	5.00	13.89
TOTAL NATIVE PERENNIAL GRASSES (w)	7.0	100.0	19.4	7.0	19.4
Standing dead	2.00	100.00		2.00	
Litter	26.00	100.00		26.00	
Bare soil	31.00	100.00		31.00	
Rock	5.00	100.00		5.00	
TOTALS	100.0			100.0	
TOTAL VEGETATION COVER	36.0 (s=0.0)		100.0	36.0 (s=0.0)	100.0
GROUND COVER (Litter+Rock+Veg+St. Dead)	69.0			69.0	
SPECIES DENSITY (# of species/100 sq.m.) (AVERAGE= 18.0 Std.Dev.= 0.0)					

Table C. Cover Data - Rocky Flats Area 18, Sept. 2010

PLANT SPECIES	Percent Foliar Cover
	Sample Number
	18-1
NATIVE ANNUAL & BIENNIAL FORBS	
Grindelia squarrosa	P
Helianthus annuus	P
TOTAL NATIVE ANN. & BIEN. FORBS	P
INTRODUCED ANNUAL & BIENNIAL FORBS	
Acosta diffusa	P
Alyssum parviflorum	P
Lactuca serriola	P
Melilotus alba	2
Podospermum laciniatum	P
Verbascum thapsus	3
TOTAL INTRO. ANN. & BIEN. FORBS	5
NATIVE PERENNIAL GRASSES (cool)	
Elymus lanceolatus fm. dasystachya	1
Elymus trachycaulus	4
Koeleria macrantha	P
Nassella viridula	1
Pascopyrum smithii	18
TOTAL NATIVE PERENNIAL GRASSES (c)	24
INTRODUCED PERENNIAL GRASSES (cool)	
Bromopsis inermis	P
Setaria viridis	P
TOTAL INTRO. PERENNIAL GRASSES (c)	P
NATIVE PERENNIAL GRASSES (warm)	
Andropogon gerardii	P
Buchloe dactyloides	2
Chondrosium gracile	5
TOTAL NATIVE PERENNIAL GRASSES (w)	7
Standing dead	2
Litter	26
Bare soil	31
Rock	5
TOTALS	100
TOTAL VEGETATION COVER	36
GROUND COVER (Litter+Rock+Veg+St.Dead)	69
SPECIES DENSITY (# of species/100 sq.m.) (AVERAGE= 18.0 Std.Dev.= 0.0)	18

Table D. Cover Data - Rocky Flats Area 33, Sept. 2010

PLANT SPECIES	AVERAGE COVER (%)	FREQUENCY (%)	RELATIVE VEGETATION COVER (%)	AVERAGE COVER-ALL (%)	RELATIVE VEGETATION COVER-ALL (%)
NATIVE ANNUAL & BIENNIAL FORBS					
<i>Grindelia squarrosa</i>	0.00	100.00	0.00	0.00	0.00
TOTAL NATIVE ANN. & BIEN. FORBS	0.0	100.0	0.0	0.0	0.0
INTRODUCED PERENNIAL FORBS					
<i>Convolvulus arvensis</i>	0.00	100.00	0.00	0.00	0.00
TOTAL INTRO. PERENNIAL FORBS	0.0	100.0	0.0	0.0	0.0
NATIVE PERENNIAL GRASSES (cool)					
<i>Elymus lanceolatus</i> fm. <i>dasystachya</i>	1.00	100.00	3.70	1.00	3.70
<i>Elymus trachycaulus</i>	1.00	100.00	3.70	1.00	3.70
<i>Pascopyrum smithii</i>	13.00	100.00	48.15	13.00	48.15
TOTAL NATIVE PERENNIAL GRASSES (c)	15.0	100.0	55.6	15.0	55.6
NATIVE PERENNIAL GRASSES (warm)					
<i>Andropogon gerardii</i>	1.00	100.00	3.70	1.00	3.70
<i>Bouteloua curtipendula</i>	2.00	100.00	7.41	2.00	7.41
<i>Buchloe dactyloides</i>	3.00	100.00	11.11	3.00	11.11
<i>Chondrosium gracile</i>	6.00	100.00	22.22	6.00	22.22
<i>Panicum virgatum</i>	0.00	100.00	0.00	0.00	0.00
TOTAL NATIVE PERENNIAL GRASSES (w)	12.0	100.0	44.4	12.0	44.4
Standing dead	4.00	100.00		4.00	
Litter	26.00	100.00		26.00	
Bare soil	26.00	100.00		26.00	
Rock	17.00	100.00		17.00	
TOTALS	100.0			100.0	
TOTAL VEGETATION COVER	27.0 (s=0.0)		100.0	27.0 (s=0.0)	100.0
GROUND COVER (Litter+Rock+Veg+St.Dead)	74.0			74.0	
SPECIES DENSITY (# of species/100 sq.m.) (AVERAGE= 10.0 Std.Dev.= 0.0)					

Table D. Cover Data - Rocky Flats Area 33, Sept. 2010

PLANT SPECIES	Percent Foliar Cover
	Sample Number
	33-1
NATIVE ANNUAL & BIENNIAL FORBS	
<i>Grindelia squarrosa</i>	P
TOTAL NATIVE ANN. & BIEN. FORBS	P
INTRODUCED PERENNIAL FORBS	
<i>Convolvulus arvensis</i>	P
TOTAL INTRO. PERENNIAL FORBS	P
NATIVE PERENNIAL GRASSES (cool)	
<i>Elymus lanceolatus</i> fm. <i>dasystachya</i>	1
<i>Elymus trachycaulus</i>	1
<i>Pascopyrum smithii</i>	13
TOTAL NATIVE PERENNIAL GRASSES (c)	15
NATIVE PERENNIAL GRASSES (warm)	
<i>Andropogon gerardii</i>	1
<i>Bouteloua curtipendula</i>	2
<i>Buchloe dactyloides</i>	3
<i>Chondrosium gracile</i>	6
<i>Panicum virgatum</i>	P
TOTAL NATIVE PERENNIAL GRASSES (w)	12
Standing dead	4
Litter	26
Bare soil	26
Rock	17
TOTALS	100
TOTAL VEGETATION COVER	27
GROUND COVER (Litter+Rock+Veg+St.Dead)	74
SPECIES DENSITY (# of species/100 sq.m.) (AVERAGE= 10.0 Std.Dev.= 0.0)	10

Table E. Cover Data - Rocky Flats Comparison Area (Jenkins Pit), Sept. 2010

PLANT SPECIES	AVERAGE COVER (%)	FREQUENCY (%)	RELATIVE VEGETATION COVER (%)	AVERAGE COVER-ALL (%)	RELATIVE VEGETATION COVER-ALL (%)
NATIVE ANNUAL & BIENNIAL FORBS					
<i>Grindelia squarrosa</i>	0.67	66.67	1.31	0.67	1.20
TOTAL NATIVE ANN. & BIEN. FORBS	0.7	66.7	1.3	0.7	1.2
INTRODUCED ANNUAL & BIENNIAL FORBS					
<i>Acosta diffusa</i>	2.67	66.67	5.23	2.67	4.82
<i>Alyssum parviflorum</i>	2.33	66.67	4.58	3.33	6.02
<i>Ambrosia artemisiifolia</i> var. <i>elator</i>	1.00	66.67	1.96	1.00	1.81
<i>Melilotus alba</i>	0.67	33.33	1.31	0.67	1.20
<i>Melilotus officinalis</i>	0.00	100.00	0.00	0.00	0.00
<i>Onopordum acanthium</i>	0.33	33.33	0.65	0.33	0.60
<i>Plantago lanceolata</i>	0.00	66.67	0.00	0.00	0.00
<i>Tragopogon dubius</i> ssp. <i>major</i>	0.33	33.33	0.65	0.33	0.60
<i>Verbascum thapsus</i>	0.00	33.33	0.00	0.00	0.00
TOTAL INTRO. ANN. & BIEN. FORBS	7.3	100.0	14.4	8.3	15.1
NATIVE ANNUAL GRASSES					
<i>Juncus bufonius</i>	0.33	33.33	0.65	0.33	0.60
TOTAL NATIVE ANN. GRASSES	0.3	33.3	0.7	0.3	0.6
INTRODUCED ANNUAL GRASSES					
<i>Bromus japonicus</i>	1.67	66.67	3.27	1.67	3.01
<i>Poa bulbosa</i>	2.67	33.33	5.23	2.67	4.82
TOTAL INTRO. ANN. GRASSES	4.3	66.7	8.5	4.3	7.8
NATIVE PERENNIAL FORBS					
<i>Aster porteri</i>	1.33	100.00	2.61	1.33	2.41
<i>Persicaria</i> sp.	0.00	33.33	0.00	0.00	0.00
TOTAL NATIVE PERENNIAL FORBS	1.3	100.0	2.6	1.3	2.4
INTRODUCED PERENNIAL FORBS					
<i>Cichorium intybus</i>	0.33	66.67	0.65	0.33	0.60
<i>Convolvulus arvensis</i>	0.00	33.33	0.00	0.00	0.00
TOTAL INTRO. PERENNIAL FORBS	0.3	66.7	0.7	0.3	0.6
NATIVE PERENNIAL GRASSES (cool)					
<i>Eleocharis acicularis</i>	0.67	33.33	1.31	0.67	1.20
<i>Eleocharis palustris</i>	1.67	33.33	3.27	1.67	3.01
<i>Juncus longistylis</i>	3.00	33.33	5.88	3.00	5.42
<i>Koeleria macrantha</i>	0.00	33.33	0.00	0.00	0.00
<i>Pascopyrum smithii</i>	5.33	100.00	10.46	6.00	10.84
<i>Poa compressa</i>	1.00	33.33	1.96	1.00	1.81
<i>Poa secunda</i>	0.00	33.33	0.00	0.00	0.00
TOTAL NATIVE PERENNIAL GRASSES (c)	11.7	100.0	22.9	12.3	22.3
INTRODUCED PERENNIAL GRASSES (cool)					
<i>Agropyron desertorum</i>	3.00	33.33	5.88	3.67	6.63
<i>Agrostis gigantea</i>	0.33	33.33	0.65	0.33	0.60
<i>Echinochloa crus-galli</i>	0.67	33.33	1.31	0.67	1.20
<i>Festuca arundinacea</i>	0.00	33.33	0.00	0.00	0.00
<i>Festuca ovina</i>	6.67	66.67	13.07	7.33	13.25
TOTAL INTRO. PERENNIAL GRASSES (c)	10.7	66.7	20.9	12.0	21.7

Table E. Cover Data - Rocky Flats Comparison Area (Jenkins Pit), Sept. 2010

PLANT SPECIES	AVERAGE COVER (%)	FREQUENCY (%)	RELATIVE VEGETATION COVER (%)	AVERAGE COVER-ALL (%)	RELATIVE VEGETATION COVER-ALL (%)
NATIVE PERENNIAL GRASSES (warm)					
Bouteloua curtipendula	1.33	100.00	2.61	2.67	4.82
Buchloe dactyloides	0.33	33.33	0.65	0.33	0.60
Chondrosum gracile	11.67	100.00	22.88	11.67	21.08
Schizachyrium scoparium	0.00	66.67	0.00	0.00	0.00
Sporobolus airoides	0.33	66.67	0.65	0.33	0.60
TOTAL NATIVE PERENNIAL GRASSES (w)	13.7	100.0	26.8	15.0	27.1
NATIVE SUBSHRUBS					
Gutierrezia sarothrae	0.00	33.33	0.00	0.00	0.00
TOTAL NATIVE SUBSHRUBS	0.0	33.3	0.0	0.0	0.0
LICHENS					
Cladonia spp.	0.67	33.33	1.31	0.67	1.20
TOTAL LICHENS	0.7	33.3	1.3	0.7	1.2
SUCCULENTS					
Opuntia macrorhiza	0.00	33.33	0.00	0.00	0.00
Opuntia phaeacantha	0.00	33.33	0.00	0.00	0.00
TOTAL SUCCULENTS	0.0	33.3	0.0	0.0	0.0
Standing dead	1.00	100.00		1.00	
Litter	16.00	100.00		16.00	
Bare soil	21.33	100.00		21.33	
Rock	10.67	100.00		10.67	
TOTALS	100.0			104.3	
TOTAL VEGETATION COVER	51.0 (s=13.2)		100.0	55.3 (s=16.5)	100.0
GROUND COVER (Litter+Rock+Veg+St.Dead)	78.7			83.0	
SPECIES DENSITY (# of species/100 sq.m.) (AVERAGE= 19.3 Std.Dev.= 3.1)					

Table E. Cover Data - Rocky Flats Comparison Area (Jenkins Pit), Sept. 2010

PLANT SPECIES	Percent Foliar Cover		
	Sample Numbers		
	V1	V2	V3
NATIVE ANNUAL & BIENNIAL FORBS			
<i>Grindelia squarrosa</i>	2	P	
TOTAL NATIVE ANN. & BIEN. FORBS	2	P	---
INTRODUCED ANNUAL & BIENNIAL FORBS			
<i>Acosta diffusa</i>	8		P
<i>Alyssum parviflorum</i>	6(3)	1	
<i>Ambrosia artemisiifolia</i> var. <i>elatior</i>		2	1
<i>Melilotus alba</i>			2
<i>Melilotus officinalis</i>	P	P	P
<i>Onopordum acanthium</i>	1		
<i>Plantago lanceolata</i>		P	P
<i>Tragopogon dubius</i> ssp. <i>major</i>	1		
<i>Verbascum thapsus</i>	P		
TOTAL INTRO. ANN. & BIEN. FORBS	16(3)	3	3
NATIVE ANNUAL GRASSES			
<i>Juncus bufonius</i>			1
TOTAL NATIVE ANN. GRASSES	---	---	1
INTRODUCED ANNUAL GRASSES			
<i>Bromus japonicus</i>	1	4	
<i>Poa bulbosa</i>		8	
TOTAL INTRO. ANN. GRASSES	1	12	---
NATIVE PERENNIAL FORBS			
<i>Aster porteri</i>	1	3	P
<i>Persicaria</i> sp.			P
TOTAL NATIVE PERENNIAL FORBS	1	3	P
INTRODUCED PERENNIAL FORBS			
<i>Cichorium intybus</i>	1		P
<i>Convolvulus arvensis</i>	P		
TOTAL INTRO. PERENNIAL FORBS	1	---	P
NATIVE PERENNIAL GRASSES (cool)			
<i>Eleocharis acicularis</i>			2
<i>Eleocharis palustris</i>			5
<i>Juncus longistylis</i>			9
<i>Koeleria macrantha</i>		P	
<i>Pascopyrum smithii</i>	12(1)	2	2(1)
<i>Poa compressa</i>			3
<i>Poa secunda</i>		P	
TOTAL NATIVE PERENNIAL GRASSES (c)	12(1)	2	21(1)
INTRODUCED PERENNIAL GRASSES (cool)			
<i>Agropyron desertorum</i>	9(2)		
<i>Agrostis gigantea</i>			1
<i>Echinochloa crus-galli</i>			2
<i>Festuca arundinacea</i>			P
<i>Festuca ovina</i>	17(2)		3
TOTAL INTRO. PERENNIAL GRASSES (c)	26(4)	---	6

Table E. Cover Data - Rocky Flats Comparison Area (Jenkins Pit), Sept. 2010

PLANT SPECIES	Percent Foliar Cover		
	Sample Numbers		
	V1	V2	V3
NATIVE PERENNIAL GRASSES (warm)			
Bouteloua curtipendula	P	3(4)	1
Buchloe dactyloides		1	
Chondrosum gracile	1	30	4
Schizachyrium scoparium	P	P	
Sporobolus airoides	1		P
TOTAL NATIVE PERENNIAL GRASSES (w)	2	34(4)	5
NATIVE SUBSHRUBS			
Gutierrezia sarothrae			P
TOTAL NATIVE SUBSHRUBS	---	---	P
LICHENS			
Cladonia spp.		2	
TOTAL LICHENS	---	2	---
SUCCULENTS			
Opuntia macrorhiza	P		
Opuntia phaeacantha	P		
TOTAL SUCCULENTS	P	---	---
Standing dead	1	1	1
Litter	26	9	13
Bare soil	6	21	37
Rock	6	13	13
TOTALS	100	100	100
TOTAL VEGETATION COVER	61(8)	56(4)	36(1)
GROUND COVER (Litter+Rock+Veg+St.Dead)	94(8)	79(4)	63(1)
SPECIES DENSITY (# of species/100 sq.m.) (AVERAGE= 19.3 Std.Dev.= 3.1)	20	16	22



Photograph 1. Area 32 Sample 1, Sept. 2010



Photograph 2. Area 32 Sample 2, Sept. 2010



Photograph 3. Area 32; vicinity of GS51 Monit. Stn. , Sept. 2010



Photograph 4. Area 18 Sample 1, Sept. 2010



Photograph 5. Area 33 Sample 1, Sept. 2010



Photograph 6. Comparison Area Sample 1, Sept. 2010



Photograph 7. Comparison Area Sample 2, Sept. 2010



Photograph 8. Comparison Area Sample 3, Sept. 2010

**Flat Areas (Areas On Pediment Tops* With Slopes Less Than 10%) Revegetation Seed Mix
(Based on 50 seeds/sq.ft.)**

Blue Map Areas

This Revegetation Specification Sheet Supercedes All Previous Revegetation Information For RFETS

Date: 2/05

Scientific Name	Common Name	Variety	% of Seed Mix	# Seeds Needed	# Seeds/Lb.	# Seeds/Sq. Ft.	Lbs./Acre (PLS)
Graminoids							
Agropyron smithii	Western Wheatgrass	Arriba	20	435600	120000	10.0	3.63
Agropyron trachycaulum	Slender Wheatgrass	San Luis	10	217800	120000	5.0	1.82
Andropogon gerardii	Big Bluestem	Bonilla	10	217800	130000	5.0	1.68
Andropogon scoparius	Little Bluestem	Aldous	8	174240	225000	4.0	0.77
Bouteloua curtipendula	Side-Oats Grama	Vaughn	15	326700	190000	7.5	1.72
Bouteloua gracilis	Blue Grama	Hachita	15	326700	710000	7.5	0.46
Buchloe dactyloides	Buffalo Grass	Texoka	5	108900	45000	2.5	2.42
Koleria pyramidata	June Grass		3	65340	2315400	1.5	0.03
Sorghastrum nutans	Indian Grass	Cheyenne	2	43560	120000	1.0	0.36
Sporobolus cryptandra	Sand Dropseed		7	152460	5298000	3.5	0.03
Stipa viridula	Green Needlegrass	Lodorm	5	108900	115000	2.5	0.95
	Total		100	2178000		50.0	13.86

Sq. ft/acre 43560
 Seeds/sq. ft. 50
 Seeds needed/acre 2178000

- 1) This pounds per acre assumes drill-seeding is used. If the seed is to be broadcast, the application rates are to be doubled.
- 2) PLS = pure live seed. Be sure to specify this to the seed dealer when ordering.
- 3) The seed is to be certified weed free.

NOTE:

* The pediment tops are the upper flat surface areas throughout the IA.
 Slender wheatgrass was added to species mix as an early successional species.

For questions regarding this spec sheet contact the K-H Ecology Group at x2231, x3560, or x5938.

**Hillside Slope Areas (Hillside Areas Or Areas With Slopes Greater Than 10%) Revegetation Seed Mix
(Based on 50 seeds/sq.ft.)**

Red Map Areas

This Revegetation Specification Sheet Supersedes All Previous Revegetation Information For RFETS

Date: 2/05

Species	Common Name	Variety	% of Seed Mix	# Seeds Needed	# Seeds/Lb.	# Seeds/Sq. Ft.	Lbs./Acre (PLS)
Graminoids							
Agropyron dasystachyum	Thickspike Wheatgrass	Critana	5	108900	150000	2.5	0.73
Agropyron smithii	Western Wheatgrass	Arriba	23	500940	120000	11.5	4.17
Agropyron trachycaulum	Slender Wheatgrass	San Luis	15	326700	120000	7.5	2.72
Bouteloua curtipendula	Side-Oats Grama	Vaughn	13	283140	190000	6.5	1.49
Bouteloua gracilis	Blue Grama	Hachita	24	522720	710000	12.0	0.74
Buchloe dactyloides	Buffalo Grass	Texoka	10	217800	45000	5.0	4.84
Stipa viridula	Green Needle Grass	Lodorm	10	217800	180000	5.0	1.21
	Total		100	2178000		50.0	15.90

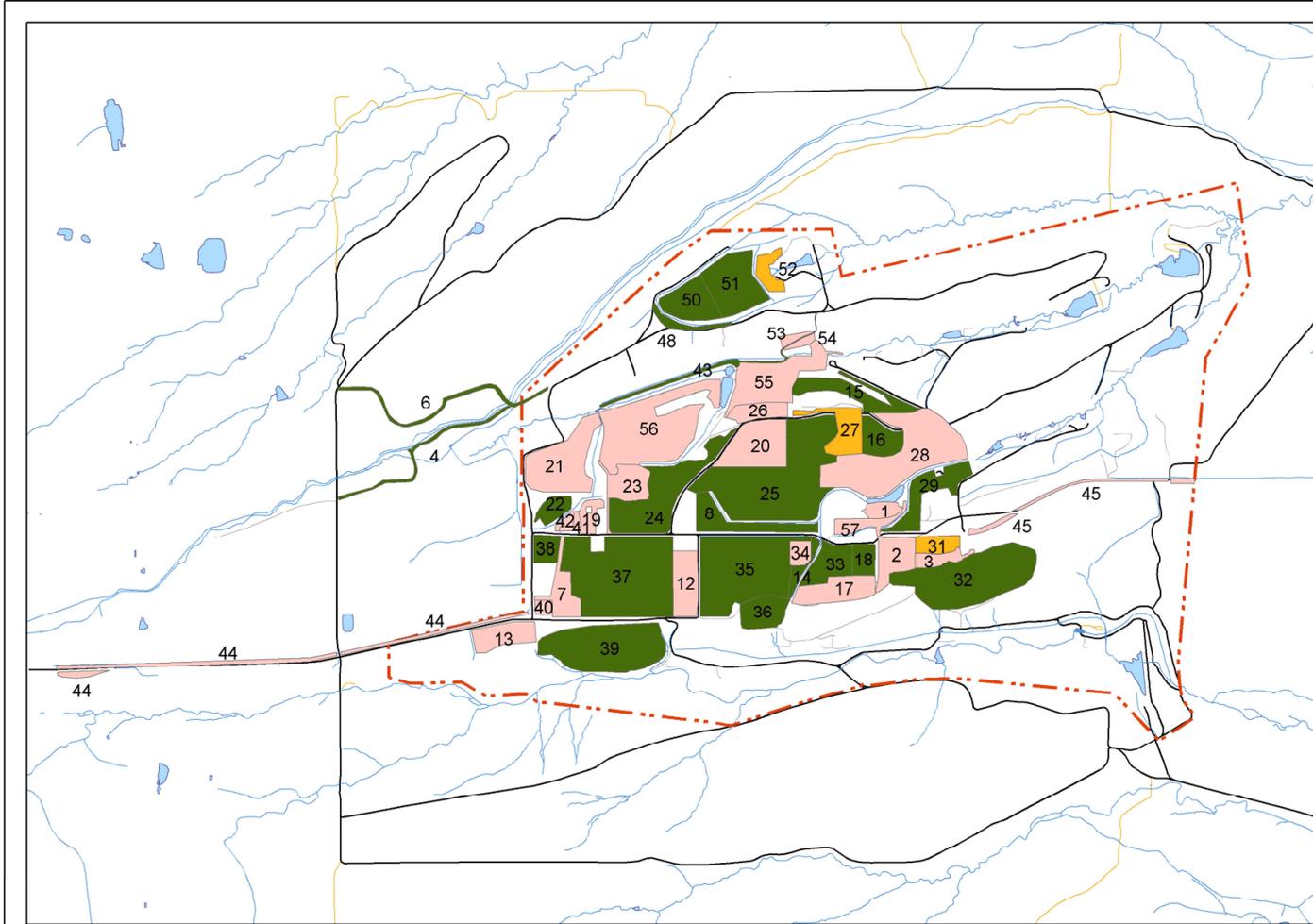
Sq. ft/acre 43560
 Seeds/sq. ft. 50
 Seeds needed/acre 2178000

- 1) This pounds per acre assumes drill-seeding is used. If the seed is to be broadcast, the application rates are to be doubled.
- 2) PLS = pure live seed. Be sure to specify this to the seed dealer when ordering.
- 3) The seed is to be certified weed free.

NOTE:

Slender wheatgrass and thickspike wheatgrass have been added to species mix as early successional species.

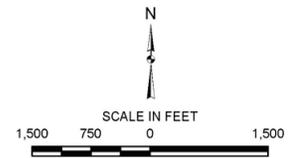
For questions regarding this spec sheet contact the K-H Ecology Group at x2231, x3560, or x5938.



Revegetation Parcels At Rocky Flats Site

Legend

- Revegetation Monitoring Locations 2009**
- Success Criteria Not Met In 2009
 - Success Criteria Met In 2009
 - Success Criteria Met In 2009 (Excluding >45% by Single Species)
 - Lake or pond
 - RFS COU Boundary
 - Stream, ditch, or other drainage feature
- Roads**
- ATV ONLY
 - OPEN
 - TRUCK BY PERMISSION



U.S. DEPARTMENT OF ENERGY GRAND JUNCTION, COLORADO
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 Under DOE Contract No. DE-AC01-07LM00060

DATE PREPARED: DECEMBER 2, 2009
 FILE NAME: S0599500