

APPENDIX 1
Species Tables

Table 1. Plant Species Listed by USFWS and NFWF Sought During Surveys of J9 Project Area, Fall 1999 and Spring 2000, Black Mesa Mine Complex, PWCC

Scientific Name	Common Name	Status
Native Perennial Forbs		
<i>Aquilegia desertorum</i>	desert columbine	G4
<i>Astragalus cremnophylax</i> var. <i>cremnophylax</i>	sentry milkvetch	Endangered
<i>Astragalus humillimus</i>	Mancos milkvetch	Endangered
<i>Astragalus naturitensis</i>	Naturia milkvetch	G4
<i>Astragalus preussii</i> var. <i>cutleri</i>	Cutler's milkvetch	G3
Native Perennial Cool-Season Grass and Grass-like Plants		
<i>Carex specuicola</i>	Navajo sedge	Threatened
<i>Puccinellia parishii</i>	Parish's alkali grass	G2
Succulents		
<i>Echinocereus triglochidiatus</i> var. <i>arizonica</i>	giant claret-cup hedgehog	Endangered
<i>Pediocactus peeblesianus</i> var. <i>fickeisoniae</i>	Fickeison plains cactus	G3
<i>Pediocactus bradyi</i>	Brady's pincushion cactus	Endangered

Table 2. Species Present in Sagebrush and Pinyon-juniper Communities, Black Mesa Mining Complex, PWCC, AZ - Fall 1999

Scientific Name	Synonym	Common Name	Pinyon-juniper	Sagebrush
NATIVE ANNUAL & BIENNIAL FORBS				
<i>Amaranthus retroflexus</i>		amaranth pigweed		X
<i>Aster canescens</i>	MACHAERANTHERA CANESCENS	hoary tansyaster		X
<i>Chenopodium fremontii</i>		Fremont goosefoot	X	
<i>Chenopodium graveolens</i>		ragleaf goosefoot	X	X
<i>Chenopodium leptophyllum</i>		narrowleaf goosefoot		X
<i>Cirsium undulatum</i>		wavyleaf thistle		X
<i>Cleome serrulata</i>		Rocky Mountain bee plant	X	
<i>Descurainia pinnata</i>		pinnate tansy-mustard	X	
<i>Dyssodia papposa</i>		fetid marigold	X	
<i>Eriogonum cernuum</i>		nodding eriogonum		X
<i>Eriogonum rotundifolium</i>		wild buckwheat	X	
<i>Ipomopsis aggregata</i>		skyrocket gilia	X	
<i>Mentzelia nuda</i>	NUTTALLIA NUDA	blazing star	X	
<i>Portulaca oleracea</i>		common purslane		X
<i>Townsendia incana</i>		townsendia	X	
INTRODUCED ANNUAL & BIENNIAL FORBS				
<i>Carduus nutans</i> ssp. <i>macrolepis</i>		musk thistle		X
<i>Chenopodium album</i>		common lambsquarters	X	X
<i>Conringia orientalis</i>		hares ear mustard	X	
<i>Erodium cicutarium</i>		filaree	X	X
<i>Euphorbia</i> sp.		spurge	X	X
<i>Fumaria occidentalis</i>		fumatory	X	
<i>Melilotus officinalis</i>		yellow sweetclover	X	
<i>Salsola iberica</i>		russian thistle		X
<i>Sisymbrium altissimum</i>		tumble mustard	X	
NATIVE ANNUAL GRASSES				
<i>Munroa squarrosa</i>		false buffalograss	X	X
INTRODUCED ANNUAL GRASSES				
<i>Bromus tectorum</i>		cheatgrass	X	

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Scientific Name	Synonym	Common Name	Pinyon-juniper	Sagebrush
NATIVE PERENNIAL FORBS				
<i>Arabis perennans</i>		rock cress	X	
<i>Artemisia pacifica</i>	OLIGOSPORUS PACIFICUS	common sagewort	X	
<i>Astragalus calycosus</i> var. <i>scapiosus</i>		Torrey milkvetch	X	
<i>Astragalus praelongus</i>		stinking milkvetch	X	
<i>Astragalus purshii</i>		Pursh milkvetch	X	X
<i>Astragalus wingatanus</i>		Fort Wingate milkvetch	X	
<i>Castilleja chromosa</i>		desert indian paintbrush	X	
<i>Cryptantha flavoculata</i>		cryptantha	X	
<i>Erigeron concinnus</i>		tidy fleabane	X	
<i>Eriogonum alatum</i>		winged eriogonum	X	
<i>Haplopappus armerioides</i>		thrifty goldenweed	X	
<i>Haplopappus nuttallii</i>		Nuttall goldenweed	X	
<i>Haplopappus spinulosus</i>		goldenweed	X	
<i>Hymenopappus filifolius</i>		fineleaf bitterweed	X	
<i>Leptodactylon pungens</i>		granite pricklygilia	X	
<i>Leucelene ericoides</i>		white aster		X
<i>Lithospermum incisum</i>		puccoon	X	
<i>Lupinus</i> spp.		lupine		X
<i>Mirabilis multiflora</i>		colorado four o'clock	X	X
<i>Mirabilis oxybaphoides</i>		short-calyx four o'clock	X	
<i>Oxybaphus linearis</i>		narrowleaf umbrellawort	X	
<i>Penstemon caespitosus</i>		mat penstemon	X	
<i>Penstemon eatoni</i>		Eaton penstemon	X	
<i>Petradoria pumila</i>		rock goldenrod	X	
<i>Phlox longifolia</i>		longleaf phlox	X	
<i>Physaria acutifolia</i>		twinpod	X	
<i>Psilostrophe sparsiflora</i>		greenstem paperflower	X	
<i>Solidago sparsiflora</i>		fewflowered goldenrod		X
<i>Sphaeralcea coccinea</i>		scarlet globemallow	X	X
<i>Stanleya pinnata</i>		desert plume	X	X
<i>Townsendia exscapa</i>		ground daisy	X	X
INTRODUCED PERENNIAL FORBS				
<i>Lathyrus eucosmus</i>		bush peavine	X	

Table 2. Species Present in Sagebrush and Pinyon-juniper Communities, Black Mesa Mining Complex, PWCC, AZ - Fall 1999

Scientific Name	Synonym	Common Name	Pinyon-juniper	Sagebrush
<i>Marrubium vulgare</i>		horehound	X	X
NATIVE PERENNIAL GRASSES (cool season)				
<i>Agropyron smithii</i>		western wheatgrass		X
<i>Agropyron trachycaulum</i>		slender wheatgrass		X
<i>Carex geophila</i>		ground sedge	X	
<i>Oryzopsis hymenoides</i>		indian ricegrass	X	X
<i>Poa fendleriana</i>		mutton grass	X	
<i>Sitanion longifolium</i>	SITANION HYSTRIX	bottlebrush squirreltail	X	
<i>Stipa columbiana</i>		Columbia needlegrass	X	
<i>Stipa comata</i>		needle-and-thread grass		X
INTRODUCED PERENNIAL GRASSES (cool season)				
<i>Bromus inermis</i>		smooth brome	X	
NATIVE PERENNIAL GRASSES (warm season)				
<i>Aristida fendleriana</i>	A. PURPUREA VAR. LONGISETA	Fendler's three-awn	X	
<i>Bouteloua gracilis</i>		blue grama	X	X
<i>Hilaria jamesii</i>		galleta		X
<i>Muhlenbergia pungens</i>		sandhill muhly	X	
<i>Sporobolus cryptandrus</i>		sand dropseed	X	X
NATIVE SUBSHRUBS				
<i>Artemisia frigida</i>		fringed sagewort	X	X
<i>Ceratoides lanata</i>		winterfat		X
<i>Chrysothamnus depressus</i>		dwarf rabbitbrush	X	
<i>Chrysothamnus greenei</i>		greene rabbitbrush		X
<i>Ephedra viridis</i>		mountain joint-fir	X	
<i>Eriogonum corymbosum</i>		buckwheat	X	
<i>Eriogonum microthecum</i>		slenderbush wild buckwheat	X	
<i>Gutierrezia sarothrae</i>		broom snakeweed	X	X
<i>Senecio douglasii</i> var. <i>longifolius</i>		threadleaf groundsel		X
NATIVE SHRUBS				
<i>Artemisia tridentata</i>		big sagebrush	X	X
<i>Atriplex canescens</i>		four-wing saltbush	X	X

Table 2. Species Present in Sagebrush and Pinyon-juniper Communities, Black Mesa Mining Complex, PWCC, AZ - Fall 1999

Scientific Name	Synonym	Common Name	Pinyon-juniper	Sagebrush
<i>Atriplex confertifolia</i>		shadscale saltbush	X	
<i>Chrysothamnus nauseosus</i>		rubber rabbitbrush	X	X
<i>Chrysothamnus viscidiflorus</i>		sticky-leaved rabbitbrush		X
<i>Cowania mexicana</i>	PURSHIA STANSBURIANA	cliff rose	X	
<i>Forestiera neomexicana</i>		desert olive	X	
<i>Lycium pallidum</i>		rabbitthorn		X
<i>Purshia tridentata</i>		antelope bitterbrush	X	
<i>Rhus trilobata</i>		squawbush	X	
<i>Tetradymia canescens</i>		gray felthorn	X	
<i>Yucca glauca</i>		small soapweed	X	
INTRODUCED SHRUBS				
<i>Tamarix pentandra</i>		saltcedar	X	
NATIVE TREES				
<i>Juniperus osteosperma</i>		Utah juniper	X	X
<i>Pinus edulis</i>		Colorado pinyon	X	X
<i>Quercus gambelii</i>		Gambel oak	X	
BRYOPHYTES				
Moss spp.		unidentified moss	X	X
LICHENS				
<i>Parmelia chlorocroa</i>	<i>Xanthoparmelia chlorocroa</i>	lichen		X
Usnea spp.		usnea lichen	X	

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Scientific Name	Synonym	Common Name	Pinyon-juniper	Sagebrush
SUCCULENTS				
<i>Coryphantha vivipara</i>		purple ballcactus	X	X
<i>Echinocereus triglochidiatus</i> var. <i>mojavensis</i>		mojave claret-cup cactus	X	X
<i>Opuntia fragilis</i> var. <i>fragilis</i>		little pricklypear	X	
<i>Opuntia macrorhiza</i>		thickroot pricklypear	X	
<i>Opuntia phaeacantha</i>		whitespine pricklypear	X	X
<i>Opuntia polyacantha</i>		plains pricklypear	X	
<i>Opuntia whipplei</i>		whipple cholla	X	
<i>Sclerocactus whipplei</i>	ECHINOCACTUS WHIPPLEI	whipple's fishhook	X	X
EPIPHYTE(PARASITE)				
<i>Orobanche fasciculata</i>		purple broomrape		X
<i>Phoradendron juniperinum</i>		juniper mistletoe	X	
MUSHROOMS				
Mushroom spp.		unidentified mushrooms	X	X

Table 3. Species Present in J9 Coal Resource Area and J9 Haul Road Corridor, Black Mesa Complex, PWCC, AZ - Spring 2000

Scientific Name	Synonym	Common Name
NATIVE ANNUAL & BIENNIAL FORBS		
<i>Amaranthus graecizans</i>		prostrate pigweed
<i>Cirsium undulatum</i>		wavyleaf thistle
<i>Descurainia richardsonii</i>		richardson tansy-mustard
<i>Lappula texana</i>	LAPPULA MARGINATA	stickseed
<i>Mentzelia albicaulis</i>		blazingstar
<i>Townsendia incana</i>		townsendia
INTRODUCED ANNUAL GRASSES		
<i>Bromus tectorum</i>		cheatgrass
NATIVE PERENNIAL FORBS		
<i>Astragalus calycosus</i> var. <i>scapiosus</i>		torrey milkvetch
<i>Brickellia brachyphylla</i>		brickell bush
<i>Calochortus kennedyi</i>		desert mariposa lily
<i>Calochortus nuttallii</i>		sego lily
<i>Cryptantha flavoculata</i>		cryptantha
<i>Cymopterus bulbosus</i>		cymopterus
<i>Cymopterus purpurascens</i>		spring parsley
<i>Eriogonum umbellatum</i>		sulfur wild buckwheat
<i>Hymenopappus filifolius</i>		fineleaf bitterweed
<i>Leptodactylon pungens</i>		granite pricklygilia
<i>Leucelene ericoides</i>		white aster
<i>Petradoria pumila</i>		rock goldenrod
<i>Solidago sparsiflora</i>		fewflowered goldenrod
<i>Sphaeralcea coccinea</i>		scarlet globemallow
<i>Thelesperma megapotamicum</i>		navajo tea
NATIVE PERENNIAL GRASSES (cool)		
<i>Agropyron smithii</i>		western wheatgrass
<i>Oryzopsis hymenoides</i>		indian ricegrass
<i>Sitanion longifolium</i>	SITANION HYSTRIX	bottlebrush squirreltail
<i>Stipa comata</i>		needle-and-thread grass
INTRODUCED PERENNIAL GRASSES (cool)		
<i>Agropyron desertorum</i>		desert wheatgrass

Table 3. Species Present in J9 Coal Resource Area and J9 Haul Road Corridor, Black Mesa Complex, PWCC, AZ - Spring 2000

Scientific Name	Synonym	Common Name
NATIVE PERENNIAL GRASSES (warm)		
<i>Bouteloua gracilis</i>		blue grama
<i>Hilaria jamesii</i>		galleta
NATIVE SUBSHRUBS		
<i>Ceratoides lanata</i>		winterfat
<i>Chrysothamnus depressus</i>		dwarf rabbitbrush
<i>Chrysothamnus greenei</i>		greene rabbitbrush
<i>Ephedra viridis</i>		mountain joint-fir
<i>Eriogonum corymbosum</i>		buckwheat
<i>Gutierrezia sarothrae</i>		broom snakeweed
NATIVE SHRUBS		
<i>Artemisia arbuscula</i> ssp. nova		black sagebrush
<i>Artemisia tridentata</i>		big sagebrush
<i>Chrysothamnus nauseosus</i>		rubber rabbitbrush
<i>Chrysothamnus parryi</i>		parry rabbitbrush
<i>Chrysothamnus viscidiflorus</i>		sticky-leaved rabbitbrush
<i>Cowania mexicana</i>	PURSHIA STANSBURIANA	cliff rose
<i>Yucca angustissima</i>		spanish bayonet
NATIVE TREES		
<i>Juniperus osteosperma</i>		utah juniper
<i>Pinus edulis</i>		colorado pinyon
LICHEN		
<i>Parmelia chlorocroa</i>	XANTHOPARMELIA CHLOROCROA	lichen
SUCCULENT		
<i>Opuntia macrorhiza</i>		thickroot pricklypear
<i>Opuntia phaeacantha</i>		pricklypear
<i>Opuntia whipplei</i>		whipple cholla
<i>Sclerocactus parviflorus</i>		barrel cactus
<i>Sclerocactus whipplei</i>	ECHINOCACTUS WHIPPLEI	whipple's fishhook