

TABLE OF CONTENTS

RECEIVED

MAR 20 1981

DIVISION OF
OIL, GAS & MINING

Volume 2

	<u>Page</u>
Fish and Wildlife Resources	
Land Use Information	2-126
Prime Farm Land Investigation	2-128
Alluvial Valley Floors	2-129
 Part 3 - Mining Operation Plan	
Mine History	3-1
Mining Plan	3-3
Mining Method	3-6
Production	3-7
Equipment	3-8
Engineering Principles and Techniques	3-9
Facilities	3-11
Dams, Embankments, and Impoundments	3-12
Coal Handling and Processing Facilities	3-14
Water Pollution Control Facilities	3-26
Transportation Facilities	3-32
Offsite Support Facilities	3-37
Air Pollution Control Plan	3-39
Existing Structures	3-41
Roads	3-55

	<u>Page</u>
Part 4 - Reclamation Plan	
Portal Seals	4-1
Backfilling and Grading	4-2
Revegetation	4-11
Reclamation Costs	4-16
Protection of the Hydrologic Balance	4-17
Postmining Land Uses	4-18
Protection of Public Parks and Historic Places	4-20
Subsidence Control Plan	4-22
Fish and Wildlife Plan	4-27

FISH AND WILDLIFE RESOURCES INFORMATION

As required by the regulations the applicant has consulted with the D.O.G.M., the D.O.W.R. and U. S. Fish & Wildlife Service. An on site field investigation of each mine site was conducted. In addition, the applicant felt to properly mitigate wildlife concerns a consultant (Jarvis) was retained to provide both wildlife baseline information and, in consultation with the U. S. Fish & Wildlife Service, initiate any necessary studies and identify any possible conflicts between wildlife and mining operations. This report is included in this section. Notwithstanding Judge Flannery's decision, applicant feels that without baseline data a proper wildlife mitigation plan cannot be developed.

As the Jarvis report and the D.O.W.R. baseline data are for the most part redundant, applicant has chosen to include only the consultant's report in this application but has included the mitigation and impact avoidance procedures as recommended by the D.O.W.R. in the Fish & Wildlife Protection Plan. The applicant has the D.O.W.R. complete baseline studies on file and copies have been sent to all concerned state and federal land management agencies.

FISH AND WILDLIFE RESOURCES
FOR WILBERG, DES-BEE-DOVE AND DEER CREEK MINES

FOR
UTAH POWER & LIGHT COMPANY

BY

JOSEPH M. JARVIS
BIOLOGIST

Joseph M. Jarvis
Biologist

Education:

MS in Wildlife Biology, Humboldt State College 1968
BS in Wildlife Biology, Humboldt State College 1961

Experience:

1. Two years as a private consultant on environmental affairs. I have conducted biological surveys, written EIS sections, and the vegetation, soils, and wildlife sections for mining permits applications to Utah Division of Oil, Gas and Mining. Also, I have participated in investigations on validity of wilderness proposals and written analysis of these areas.
2. My government career has included a three year research project with the Utah Division of Wildlife Resources. Service with the Bureau of Land Management included wildlife biologist and Area Manager, a supervisory position. I also worked for the U. S. Fish and Wildlife Service on a cooperative research project in Nevada for my Master's Thesis.
3. With this background I have become very much acquainted with the terrestrial biology of the intermountain west. I also am knowledgeable with State and Federal government operations.

MINE PLAN AREA

The UP&L lease area covers the south half of East Mountain in the Wasatch Plateau. Life zones range from Upper Sonoran below the mines to Canadian on top. The three mines are located in steep rocky canyons on the south and east slopes of the mountain. The Cottonwood fan portal, now under construction, is located adjacent to Cottonwood Creek at the base of a steep rock southwest facing slope of East Mountain.

METHODS

The mine plan was submitted to Utah Oil, Gas and Mining Board who in turn consulted the respective wildlife agencies for recommendations. Based on the Board's guidelines most of the wildlife information was obtained from existing records and publications. Some field surveys are scheduled to assess the occurrence of raptors and migratory birds nesting at the Cottonwood fan portal construction site. These surveys are scheduled throughout the nesting season.

Wildlife habitats were coordinated with the designations used in the vegetative survey. With the vegetative map and the species list for the Wasatch Plateau a list of species likely to occur in the mine area was developed (Table 1).

EXISTING FISH AND WILDLIFE RESOURCES

Wildlife Habitats

The habitats within the mine plan area are rated as 2 by Bob Scott and others for coal lands of Utah (Scott, 1977). Around the mines the cliffs are considered raptor nesting habitat with the slopes below and the flat lands above the cliffs as raptor feeding areas. The lower slopes and alluvial fans below the mines are rated as deer winter range. This also includes the Cottonwood fan portal site. All elk range is above the mines on the top of East Mountain (Table 2).

The habitats at the Cottonwood fan portal, Wilberg Mine and Des-Bee-Dove Mines are designated as pinyon-juniper with many open rock and cliff areas. At the Deer Creek Mine some riparian habitat exists along Deer Creek below the mine. The south facing slopes of this steep canyon are covered with pinyon-juniper and the north facing slopes are covered with a mixed conifer stand.

The habitat designations are listed below:

- S - Sagebrush
- G - Grassland
- SD - Salt Desert Shrubs
- R - Riparian
- P-J - Pinyon-Juniper
- MC - Mixed Conifer (includes Aspen Groves)

- a. Sagebrush - All the sagebrush communities are situated between 8000 and 10,000 foot elevations along the top of the East Mountain plateau. They

exist as short sage communities generally on ridge tops and flats. Aspen groves are scattered through the sagebrush communities on the flats and along the edges. A few areas around springs still harbor small wet meadows.

- b. Grassland - Two small areas on ridges in tributaries of Cottonwood Creek.
- c. Salt Desert Shrub - This plant community is located on the lower slopes adjacent to the access road to the Des-Bee-Dove Mines.
- d. Riparian - The streams are small and flow through steep narrow canyons. Consequently the riparian zone is very narrow often less than 30 yards wide. The vegetative composition varies from the broad-leaved trees and shrub plant community normally depicted as characteristic of riparian areas to many areas where there is only an increased density of conifers and/or aspen.
- e. Pinyon-Juniper - This pygmy forest is located on steep slopes and talus slides that are crowned by near vertical to vertical rock escarpments. In many areas especially on the south face of East Mountain the forest consists of scattered trees growing amidst huge rocky cliffs and rough rock piles. Where steep canyons occur the pinyon-

juniper forest is only found on south facing slopes or on rocky exposed ridges. In many areas where the pinyon-juniper grades into the mixed conifer stands a mountain brush plant community exists as an ecotone between the two tree dominated plant communities. These areas are generally confined to a single slope of less than 200 acres.

- f. Mixed Conifer - The mixed conifer community is spread all over East Mountain, on the top, the slopes, and in the steep side canyons. Below 8000 feet elevation conifers are found only on north-facing slopes in steep canyons. Fir species generally dominate the stands along with spruce and a scattering of aspens at the sagebrush interface.

Wildlife List (See Table 1)

SPECIES OF SPECIAL SIGNIFICANCE

The species listed here and their habitat requirements are discussed in the following paragraphs. This list was derived from Utah Division of Oil, Gas and Mining's guidelines and from Utah Division of Wildlife Resources' status list (DOGM, 1980 and UDWR, 1979).

<u>Species</u>	<u>Status</u>	<u>Habitat</u>	<u>Comments</u>
Western Bluebird (<u>Sialia mexicana</u>)	Federal Migratory	MC,P-J	Probably occurs within mine plan area
American Peregrine Falcon (<u>Falco peregrinus</u>)	T & E	All	Does not occur, no sightings
Bald Eagle (<u>Haliaeetus leucocephalus</u>)	T & E	All	Winter visitor
Snowshoe Hare (<u>Lepus americanus</u>)	DWR limited	MC	Probably occurs on lease but not in mine plan area
Northern Flying Squirrel (<u>Glaucomys sabrinus</u>)	DWR limited	MC	" "
Red Bat (<u>Lasiurus cinereus</u>)	DWR limited	MC	" "
Utah Mountain Kingsnake (<u>Lampropeltis pyromelana</u>)	DWR limited	R,P-J,MC	Possibly occurs in mine plan area
Utah Milksnake (<u>Lampropeltis triangulum</u>)	DWR limited	MC	Probably occurs on lease but not in mine plan area
Tiger Salamander (<u>Ambystoma tigrinum</u>)	DWR questioned	R	" "

THREATENED AND ENDANGERED

A letter from U. S. Fish and Wildlife Service dated November 6, 1980. "To the best of our knowledge, no endangered or threatened plant species or critical habitat for threatened or endangered wildlife species occur in the disturbed areas of the subject mining operations."

RAPTORS

The raptors in this area are listed in prior paragraphs. Further discussions are found in the early parts of this discussion.

EFFECTS OF MINING OPERATIONS ON FISH AND WILDLIFE

The Deer Creek, Des-Bee-Dove and the Wilberg Mines are currently operating. Their effects on wildlife are now historical and the species affected have either emigrated from the disturbed sites, adjusted to the disturbances or expired due to loss of habitat. The primary losses were probably raptor nesting sites around the mines and deer winter range from road construction. At the Deer Creek Mine some riparian habitat was destroyed at the mine site.

The truck traffic on the mine access roads kills an unknown number of deer each year. The percent loss to the wintering deer herds is unknown. Some raptor disturbance continues at the mines and along the access roads which transect some of their hunting territory. The powerline to the Des-Bee-Dove Mines, adjacent to the access road, is potentially a trap to roosting birds presenting a tempting target to some travelers along the road.

The construction of the Cottonwood fan portal will disturb about five acres of pinyon-juniper habitat on a steep rocky southwest facing slope. This action has the potential of disrupting raptor use of the area especially during the nesting

season. Some species of migratory birds of high federal interest could nest at this site. The most likely would be the western bluebird. This southwest facing slope also has the potential for snake dens. Below is listed a summary of certain reptile and amphibian species referred to in Utah Division of Oil, Gas and Mining letter to Utah Power and Light dated December 5, 1980.

- a. Utah Mountain Kingsnake - These snakes are widely distributed throughout the mountains of Utah in specific localized drainages. The habitat requirements are drainages with wet meadows, brushy riparian areas and perennial streams. They use rocky south facing slopes adjacent to riparian habitat for denning.

The drainages around East Mountain lack these components for a preferred environment because many of the streams are eroded and lack meadows. Thus it is doubtful these snakes inhabit any of the disturbed areas.

- b. Utah Milk Snake - This snake could occur in the riparian areas and in the mixed conifer habitat. Most likely place would be in that portion of the drainages with mixed conifer vegetation. This habitat type is far removed from any disturbed areas.

- c. Tiger Salamander - These salamanders prefer quiet pools, ponds, or springholes. Since most of these water types occur on top of East Mountain it is doubtful any tiger salamanders would be disturbed by proposed construction.

MITIGATION AND MANAGEMENT PLANS

The presence of operating mines and facilities minimizes the opportunities for mitigation. These mines are located in steep rocky canyons with poor soils consequently the rehabilitation results will probably be poor to nonexistent.

The small riparian zones at the Wilberg and Deer Creek Mines will be protected from further disturbances and destruction.

To reduce the undue disturbance and killing of wildlife an education program for employees would be developed that incorporates the following:

- a. To reduce deer-vehicle collisions
1. Reduce speeds on haul roads to 50 MPH
 2. Be especially aware of deer at dawn and dusk
 3. When deer are spotted on the roads at night flash lights to break their entrancement
 4. Reenforce the value of deer to each employee.

- b. To reduce raptor harassment
 - 1. Restrict employees from shooting at raptors, a protected species
 - 2. Avoid nesting sites as human intrusion causes abandonment of nests and young
 - 3. This also applies to all nests and young of wildlife as abandonment is often the result of human intrusion and disturbance.

To reduce impacts at the Cottonwood fan portal site a raptor and migratory bird nesting survey will be conducted throughout the nesting season prior to resumption of construction. Construction can be delayed until the young disperse if recorded active nesting would be disturbed.

Raptor and Migratory Bird Survey

The survey area will be a 1 KM zone around the portal site. Within this zone there are steep rocky slopes, a riparian area along Cottonwood Creek, an open grassland, and some mixed conifer stands at the head of the drainages. No raptor nests have been recorded here and the presence of the active Trail Mountain Mine may be affecting the use of the immediate area. With this variety of habitat the following species could be nesting here:

Screech Owl	(<u>Otus asio</u>)
Great Horned Owl	(<u>Bubo virgianus</u>)
Red-tailed Hawk	(<u>Buteo lineatus</u>)
Golden Eagle	(<u>Aquila chrysaetos</u>)
Kestrel Falcon	(<u>Falco sparverius</u>)

The following raptors have a remote possibility of nesting in this area:

Pygmy Owl	(<u>Glaucidium gnoma</u>)
Long-eared Owl	(<u>Asio otus</u>)
Flammulated Owl	(<u>Otus flammeolus</u>)
Cooper's Hawk	(<u>Accipiter cooperii</u>)
Sharp-shinned Hawk	(<u>Accipiter striatus</u>)
Prairie Falcon	(<u>Falco mexicanus</u>)
Merlin	(<u>Falco columbarius</u>)
Swainson's Hawk	(<u>Buteo swainsoni</u>)

The survey will begin in February and continue through June, 1981. Observations of raptor activity, nest searching, and owl calling will be utilized to locate nesting raptors. Migratory birds such as the western bluebird will be located by observing behavior (male territorial activity) and nest searching.

Survey Schedule (1981)

February	one day and two nights
April	one day and one night
May	two days and one night
June	two days

The revegetation of the construction site with the proper browse species would enhance in a small way this deer winter range. This early successional plant community will provide a feeding area for passerine birds and rodents. This in turn provides prey for raptors and mammalian predators.

MONITORING

Annual surveys will be conducted to assess the impact, if any, of wildlife use in and around the fan portal. Raptors,

migratory birds, deer, and any other species of special significance discovered during the initial surveys will be given special attention. Some of the effort will be directed at determining whether the revegetation work actually increased wildlife use of this area.

No surveys are contemplated for the active mine areas.

BIBLIOGRAPHY

Dalton, L. B. and others, 1978, Species List of Vertebrate Wildlife That Inhabit Southeastern Utah. Utah Division of Wildlife Resources Publication #78-16, Salt Lake City, Utah.

DOGM, Dec. 5, 1980 Guidelines for Fish and Wildlife Plan, letter.

Robbins, C. S., Bruun, B., and Zim, H. S., 1966, A Field Guide to Identification of Birds of North America, Golden Press, New York, New York.

Scott, R. W., Boner, T. C. and Smith, R. 1977, Ranking of Wildlife Value on Federal Coal Lands, Utah Division of Wildlife Resources, Salt Lake City, Utah.

Stebbins, R. C., 1966, A Field Guide to Western Reptiles and Amphibians, Houghton Mifflin Company, Boston, Mass.

UDWR, 1979, Status of Selected Animal and Plant Species in Utah (Revised) Salt Lake City, Utah.

TABLE I
VERTEBRATE SPECIES OF THE WASATCH PLATEAU

Fishes:

Species	Status	Habitat	Probable Occurrence on UP & L Leases
Cutthroat trout	C	lakes, streams	
Rainbow trout	C	"	
Brown trout	C	"	
Brook trout	L	"	
Carp	C	"	
Utah chub	C	"	
Leatherside chub	C	streams	
Longnose dace	U	"	
Speckled dace	C	"	
Redside shiner	C	lakes, streams	
Bluehead sucker	C	"	
Mountain sucker	L	streams	
Mottled sculpin	C	"	
Largemouth bass	C	lakes	

Amphibians:

Tiger salamander	C	R, MC	X
Great Basin Spadefoot toad	C	S	X
Western toad	K	R	X
Woodhouse's toad	C	G,S	
Chorus frog	C	S	X
Leapord frog	C	R	X

Reptiles:

Species	Status	Habitat	Probable Occurrence on UP & L Leases
Collared Lizard	C	SD	X
Leopard Lizard	C	SD	
Eastern Fence Lizard	C	SD,P-J	X
Sagebrush Lizard	C	SD,P-J	X
Tree Lizard	C	P-J	X
Side-blotched Lizard	C	SD	X
Short-horned Lizard	C	SD,P-J,S,MC	X
Western Whiptail	C	SD	
Rubber Boa	C	MC	X
Striped Whipsnake	C	SD,P-J	X
Racer	C	S,MC	X
Ringneck Snake	K	R,MC	X
Gopher Snake	C	SD,P-J,S	X
Milk Snake	K	MC	X
Sonora Mountain Kingsnake	K	R,P-J,MC	X
Western Terrestrial Garter Snake	C	R,P-J,MC	X
Common Garter Snake	K	R	X
Night Snake	C	SD	
Midget Faded Rattlesnake	C	P-J	X

Birds:

Common Loon	U	Lakes
Horned Grebe	R	"
Eared Grebe	C	"
Western Grebe	C	"
Pied-billed Grebe	C	"

Birds con't.

Species	Status	Habitat	Probable Occurrence on UP & L Leases
Double-crested Cormorant	U	"	
Snowy Egret	C	Marshes	
Great Blue Heron	C	"	X
Black-crowned Night Heron	C	"	
American Bittern	U	"	
White-faced Ibis	C	"	
Whistling Swan	O	"	
Canada Goose	C	"	
White-fronted Goose	R	Marshes	
Snow Goose	U	"	
Ross's Goose	O	"	
Mallard	C	"	X
Gadwall	C	"	
Pintail	C	"	
Green-winged Teal	C	"	X
Blue-winged Teal	C	"	
Cinnamon Teal	C	"	
American Widgeon	C	"	
Northern Shoveler	C	"	
Wood Duck	R	"	
Redhead	C	Lakes	
Ring-necked Duck	U	"	
Canvasback	C	"	
Greater Scaup	U	"	
Lesser Scaup	C	"	

Birds cont.

Species	Status	Habitat	Probable Occurrence on UP & L Leases
Common Goldeneye	U	Lakes	
Bufflehead	U	"	
Ruddy Duck	C	"	
Hooded Merganser	R	Streams	
Common Merganser	C	Streams	
Red-breasted Merganser	C	"	
Turkey Vulture	C	All	X
Goshawk	C	MC	X
Sharp-shinned Hawk	U	MC,S	X
Cooper's Hawk	C	R,MC,P-J	X
Red-tailed Hawk	C	All	X
Swainson's Hawk	U	S,P-J	X
Rough-legged Hawk	C	SD	X
Ferruginous Hawk	U	SD	X
Golden Eagle	C	All	X
Bald Eagle	E	All	X
Marsh Hawk	C	SD	
Osprey	U	Lakes	
Prairie Falcon	C	P-J	X
Peregrine Falcon	E	All	
Merlin	C	P-J	X
American Kestrel	C	R,SD,P-J	X
Blue Grouse	C	MC	X
Ruffed Grouse	C	MC	X
Sage Grouse	C	S	
California Quail	C	R	

Birds con't.

Species	Status	Habitat	Probable Occurrence on UP & L Leases
Chukar	C	SD	
Ring-necked Pheasant	C	Fields	
Sandhill Crane	R	Marshes	
Virginia Rail	C	"	
Sora Rail	U	"	
Common Gallinule	R	"	
American Coot	C	"	
Semipalmated Plover	U	"	
Snowy Plover	U	"	
Killdeer	C	S	X
Mountain Plover	R	Marshes	
American Golden Plover	U	"	
Black-bellied Plover	C	"	
Common Snipe	C	S	X
Long-billed Curlew	U	Marshes	
Willet	U	"	
Spotted Sandpiper	C	S	X
Solitary Sandpiper	U	Marshes	
Greater Yellowlegs	U	"	
Lesser Yellowlegs	C	"	
Pectoral Sandpiper	U	"	
Baird's Sandpiper	U	"	
Least Sandpiper	C	"	
Western Sandpiper	C	"	
Sanderling	U	"	
Short-billed Dowitcher	U	"	
Long-billed Dowitcher	C	"	

Birds Con't.

Species	Status	Habitat	Probable Occurrence on UP & L Leases
Marbled Godwit	C	Marshes	
American Avocet	C	"	
Black-necked Stilt	C	"	
Wilson's Phalarope	C	"	
Northern Phalarope	C	Lakes	
Herring Gull	U	"	
California Gull	C	"	
Ring-billed Gull	C	"	
Franklin's Gull	C	"	
Bonaparte's Gull	U	"	
Forsters Tern	C	"	
Common Tern	U	"	
Black Tern	C	"	
Caspian Tern	U	"	
Band-tailed pigeon	U	MC	
Rock Dove	C	P-J	
Mourning Dove	C	All	X
Yellow-billed Cuckoo	K	R	
Barn Owl	K	P-J	
Screech Owl	U	R	X
Flammulated Owl	K	MC	X
Great Horned Owl	C	All	X
Pygmy Owl	K	R, P-J	X
Burrowing Owl	L	SD	

Birds Con't.

Species	Status	Habitat	Probable Occurrence on UP & L Leases
Long-eared Owl	C	P-J	X
Short-eared Owl	C	Marshes	
Saw-whet Owl	K	MC	X
Common Nighthawk	C	SD	X
Poor-will	C	P-J	X
Black Swift	U	MC	X
White-throated Swift	C	P-J	X
Black-chinned Hummingbird	C	R	X
Broad-tailed Hummingbird	C	All	X
Rufous Hummingbird	C	MC	X
Calliope Hummingbird	C	MC	X
Belted Kingfisher	U	R	
Common Flicker	C	MC	X
Yellow-bellied Sapsucker	C	MC	X
Hairy Woodpecker	C	MC	X
Downy Woodpecker	C	R	X
Northern Three-toed Woodpecker	U	MC	X
Western Kingbird	C	SD	
Cassin's Kingbird	U	P-J	X
Eastern Kingbird	C	R	
Ash-throated Flycatcher	C	SD	
Says Phoebe	C	SD, P-J	
Willow (Traill's) Flycatcher	C	S	X
Hammond's Flycatcher	U	MC	X

Birds con't.

Species	Status	Habitat	Probable Occurrence on UP & L Leases
Dusky Flycatcher	C	MC	X
Gray Flycatcher	K	S,P-J	X
Western Flycatcher	C	MC	X
Western Wood Peewee	C	MC	X
Olive-sided Flycatcher	U	MC	X
Horned Lark	C	SD	X
Violet-green Swallow	C	All	X
Tree Swallow	C	S	X
Bank Swallow	C	R	
Rough-winged Swallow	C	R	
Barn Swallow	C	P-J	X
Cliff Swallow	C	P-J	X
Purple Martin	U	MC	X
Steller's Jay	C	MC	X
Gray Jay	R	MC	X
Scrub Jay	C	R,P-J	X
Black-billed Magpie	C	R,P-J	X
Common Raven	C	All	X
Common Crow	O	R	
Pinion Jay	C	S,P-J	X
Clark's Nutcracker	C	MC	X
Black-capped Chickadee	C	MC	X
Mountain Chickadee	C	MC	X
Plain Titmouse	C	P-J	X
Bushtit	C	MC	X
White-breasted Nuthatch	C	MC	X
Red-breasted Nuthatch	C	MC	X

Birds con't.

Species	Status	Habitat	Probable Occurrence on UP & L Leases
Pygmy Nuthatch	C	MC	X
Brown Creeper	C	MC	X
Dipper	C	R	
House Wren	C	MC	X
Rock Wren	C	SD,P-J	X
Canyon Wren	C	P-J	X
Bewick's Wren	C	P-J	X
Long-billed Marsh Wren	L	marshes	
Mockingbird	U	R	
Gray Catbird	U	R	
Sage Thrasher	C	S	X
American Robin	C	R,MC	X
Hermit Thrush	C	MC	X
Swainson's Thrush	C	MC	X
Veery	U	R	
Western Bluebird	U	MC,P-J	X
Mountain Bluebird	C	S,MC	X
Townsend's Solitaire	C	MC,P-J	X
Blue-gray Gnatcatcher	C	R	X
Golden-crowned Kinglet	U	MC,P-J	X
Ruby-crowned Kinglet	C	MC	X
Water Pipet	C	plains	
Bohemian Waxwing	U	R,MC	X
Cedar Waxwing	C	woodlands	
Northern Shrike	U	SD	
Loggerhead Shrike	C	SD	
Starling	C	All	X

Birds con't.

Species	Status	Habitat	Probable Occurrence on UP & L Leases
Solitary Vireo	U	R,P-J	X
Warbling Vireo	C	R	X
Orange-crowned Warbler	C	MC	X
Nashville Warbler	U	MC	X
Virginia's Warbler	C	P-J	X
Yellow Warbler	C	R	
Magnolia Warbler	U	MC	X
Yellow-rumped Warbler	C	MC	X
Black-throated Gray Warbler	C	P-J	X
Townsend's Warbler	U	MC	X
MacGillivray's Warbler	C	R	X
Yellowthroat	L	R	
Yellow-breasted Chat	C	R	
Wilson's Warbler	C	R	X
American Redstart	U	R	
House Sparrow	C	cities	
Western Meadowlark	C	SD	
Yellow-headed Blackbird	C	marshes	
Red-winged Blackbird	C	"	
Northern Oriole	C	R	
Rusty Blackbird	O	R	
Brewer's Blackbird	C	R	
Common Grackle	A	R	
Brown-headed Cowbird	C	R	X
Western Tanager	C	MC	X
Black-headed Grosbeak	C	R	X
Lapland Longspur	R	G	

Birds con't.

Species	Status	Habitat	Probable Occurrence on UP & L Leases
Indigo Bunting	R	R	
Lazuli Bunting	C	R,S	X
Green-tailed Towhee	C	S, P-J	X
Rufous-sided Towhee	C	S	X
Lark Bunting	O	SD	
Savannah Sparrow	C	G	
Grasshopper Sparrow	R	G	
Vesper Sparrow	C	S, SD	X
Lark Sparrow	C	S, SD	X
Sage Sparrow	U	S, SD	X
Dark-eyed Junco	C	MC	X
Gray-headed Junco	C	MC	X
Tree Sparrow	U	R	X
Chipping Sparrow	C	MC,P-J	X
Brewer's Sparrow	C	S,SD	X
Harris Sparrow	U	P-J	
White-crowned Sparrow	C	P-J	X
Fox Sparrow	K	R	X
Lincoln's Sparrow	U	R	
Song Sparrow	C	G	X
Black-throated Sparrow	U	S,P-J	X
Evening Grosbeak	C	MC	X
Cassin's Finch	C	MC	X
House Finch	C	All	X
Pine Grosbeak	U	MC	X
Rosy Finch	C	S	
Pine Siskin	C	MC	X

Birds con't.

Species	Status	Habitat	Probable Occurrence on UP & L Leases
American Goldfinch	C	R,P-J	X
Lesser Goldfinch	C	P-J	X
Red Crossbill	U	MC	X
Mammals:			
North Water Shrew	C	R	
Merriam Shrew	U	S,MC	X
Vagrant Shrew	C	R	
Masked Shrew	C	R	
Dusky Shrew	C	MC	X
Little Brown Myotis	C	P-J	X
Fringed Myotis	U	SD, P-J	X
Long-Eared Myotis	C	MC	X
Long-legged Myotis	C	P-J	X
Yuma Myotis	U	P-J	X
California Myotis	C	"	X
Small-footed Myotis	U	"	X
Silver-haired Bat	C	MC	X
Western Pipistrelle	C	P-J	X
Big Brown Bat	C	"	X
Red Bat	U	MC	X
Hoary Bat	U	"	X
Western Big-eared Bat	C	P-J	X
Pallid Bat	C	SD	
Mexican Free-tailed Bat	C	SD	X
Pika	C	MC,P-J	X
White-tailed Jackrabbit	C	S	X

Mammals con't.

Species	Status	Habitat	Probable Occurrence on UP & L Leases
Snowshoe Hare	C	MC	X
Black-tailed Jackrabbit	C	SD,P-J	X
Mountain Cottontail	C	S,G	X
Desert Cottontail	C	SD,P-J	X
White-tailed Prairie Dog	C	SD	
Red Squirrel	C	MC	X
Rock Squirrel	C	SD,P-J	X
Uintah Ground Squirrel	C	G, S	X
Golden-mantled Ground Squirrel	C	S,MC	X
Whitetail Antelope Squirrel	C	SD	X
Yellow-bellied Marmot	C	S,MC	X
Northern Flying Squirrel	C	MC	X
Least Chipmunk	C	S,SD,P-J	X
Uintah Chipmunk	C	MC	X
Cliff Chipmunk	U	P-J	X
Northern Pocket Gopher	C	G, S	X
Valley or Botta Pocket Gopher	C	G,S, P-J	X
Ord Kangaroo Rat	C	SD, P-J	X
Great Basin Pocket Mouse	C	SD	X
Beaver	C	R	X
Western Harvest Mouse	C	G, R	X
Canyon Mouse	C	P-J	X
Deer Mouse	C	All	X
Brush Mouse	C	P-J	X
Pinion Mouse	C	P-J	X
Desert Wood Rat	C	SD, P-J	X
Bushy-tailed Wood Rat	C	MC, P-J	X

Mammals con't

Species	Status	Habitat	Probable Occurrence on UP & L Leases
Meadow Vole	C	S	X
Mountain Vole	C	S	X
Richardson's Vole	C	R	X
Longtail Vole	C	S, R	X
Black Rat	C	Mines	X
Norway Rat	C	"	X
House Mouse	C	"	X
Western Jumping Mouse	C	R	
Porcupine	C	MC	X
Coyote	C	ATI	X
Red Fox	C	MC	X
Kit Fox	U	SD	
Gray Fox	C	P-J	X
Black Bear	C	MC	X
Ring-tailed Cat	C	P-J	X
Raccoon	O	R	X
Short-tailed Weasel	R	P-J	X
Long-tailed Weasel	C	R	X
Mink	L	streams	
Black-footed Ferret	E	SD	
Marten	R	MC	X
Badger	C	S,MC,P-J	X
Striped Skunk	C	P-J	X
Spotted Skunk	C	R	X
River Otter	R	streams	

Mammals con't

Species	Status	Habitat	Probable Occurrence on UP & L Leases
Bobcat	C	MC,P-J	X
Cougar	C	Mc,P-J	X
Mule Deer	C	All	X
Moose	L	R	
Rocky Mountain Elk	C	MC	X

TABLE I
KEY

Status	-	Population
C	-	Common, Widespread and Abundant
U	-	Uncommon, Widespread but not Abundant
R	-	Rare, Seldom Seen.
E	-	Endangered, Candidate for Extinction
T	-	Threatened, Candidate for Endangered
L	-	Limited, Restricted to a Specific Habitat
K	-	Status Unknown

Habitat	-	
S	-	Sagebrush
G	-	Grassland
SD	-	Salt Desert Shrub
R	-	Riparian
P-J	-	Pinyon-Juniper Forest
MC	-	Mixed Conifer (Includes Aspen Groves)

TABLE II

Wildlife Rankings of Habitat within
Mine Plan Area

Mine	Section	Ranking ^a	Principal Use
Deer Creek	T 17 S R 7 E Sec. 10	2	DWR
Des-Bee-Dove	T 17 S R 7 E Sec. 26	2	DWR
Wilberg	T 17 S R 7 E Sec. 27	2	DWR
Cottonwood Fan Portal Zone	T 17 S R 7 E Sec. 30	1	EWR ^b DWR
	T 17 S R 6 E Sec. 25	1	EWR ^b DWR
	Sec. 36	2	DWR

^a (Scott, 1977)

^b No longer considered elk winter range

LAND USE INFORMATION (783.22)

Deseret-Beehive-Little Dove Mines are conglomerated into a single surface mining complex located in a dry wash contributory to Grimes Wash. Mining had its beginning about 1940 and has grown incrementally through the years. No maps or photos are available prior to the date of beginning. Land use prior to mining was grazing and wildlife (local land users).

The vegetation communities adjacent to the disturbed area are classified as pinyon-juniper along the steep eroded sandstone ledges. Lower elevations are dominated by desert saltbush in Chapeta soils and Mancos shales (see soils information).

Capability of the land prior to mining is not known. Capability of land adjacent to the mining area from the designated reference area is not known as production yields were not required from the regulatory authority.

Discussions with the Bureau of Land Management, Price office (Rowley) and the U. S. Forest Service (Price), Thompson confirmed that land use during the past thirty years has changed little.

B.L.M. grazing permits are active during early Spring, April 1 through June 10, at which time grazing on East Mountain begins where lands are consolidated into one grazing

allotment called East Mountain grazing allotment. This cattle allotment has 1934 AUM's supporting 726 cows and necessary horses for herders during range periods of June 21 through September 10.

Range conditions on the lower B.L.M. lands were in a depleting state six years ago and cattle allotments were reduced in numbers. Conditions on East Mountain (elevations 8,500 to 10,200) are considered good with post-range rehabilitation work showing results.

Comparable range study sites were not available. The Forest Service showed 314 pounds per acre yield from a sagebrush study plot in Cottonwood Canyon near Mills Canyon junction.

Premining land use for purposes of this application is designated as range and wildlife habitat. Local zoning designation is classified as RF & M - recreation, forestry and mining.

Postmining utilized room and pillar mining methods with conventional and continuous mining machinery. Coal seams mined were Blind Canyon and Hiawatha. Extent of mining prior to this application is shown on the mining plan.

PRIME FARMLAND INVESTIGATION (783.27)

Although this section is nonapplicable, the Des-Bee-Dove site and associated land disturbances do not qualify as prime farmlands for the following reasons:

1. Historically the lands prior to construction were not used as crop land.
2. The slopes of and surrounding the portal area exceed 10 per cent.
3. There is no developed water supply qualifying as an irrigation source.

In keeping with the regulations, applicant requests the Division to make a negative determination.

ALLUVIAL VALLEY FLOORS (785.19)

The statutory definition of alluvial valley floors is as follows: "'alluvial valley floor' means the unconsolidated stream laid deposits holding streams where water availability is sufficient for subirrigation or flood irrigation agricultural activities but does not include upland areas which are generally overlain by a thin veneer of colluvial deposits composed chiefly of debris from sheet erosion, deposits by unconcentrated runoff or slope wash, together with talus, other mass movement accumulation and windblown deposits." The surface facilities located at the Deer Creek, Wilberg, and Church underground mines are situated in relatively narrow canyons which slope up directly from the draining stream. The canyons lack any soil development and do not contain irrigatable land which could be used for agricultural purposes. The canyons in which the surface facilities are located contain deposits of mass movements, slope wash, debris erosion and sheet runoff. The area is classified as an upland and nonirrigation area and therefore cannot be considered as an alluvial valley floor. Furthermore, disturbance or interruption of aquifers within the underground mine complex will have no effect on downstream alluvial valley floors, insomuch as the water will eventually reach the downstream portions of the drainage system through one system or another.

DES-BEE-DOVE MINE OPERATION

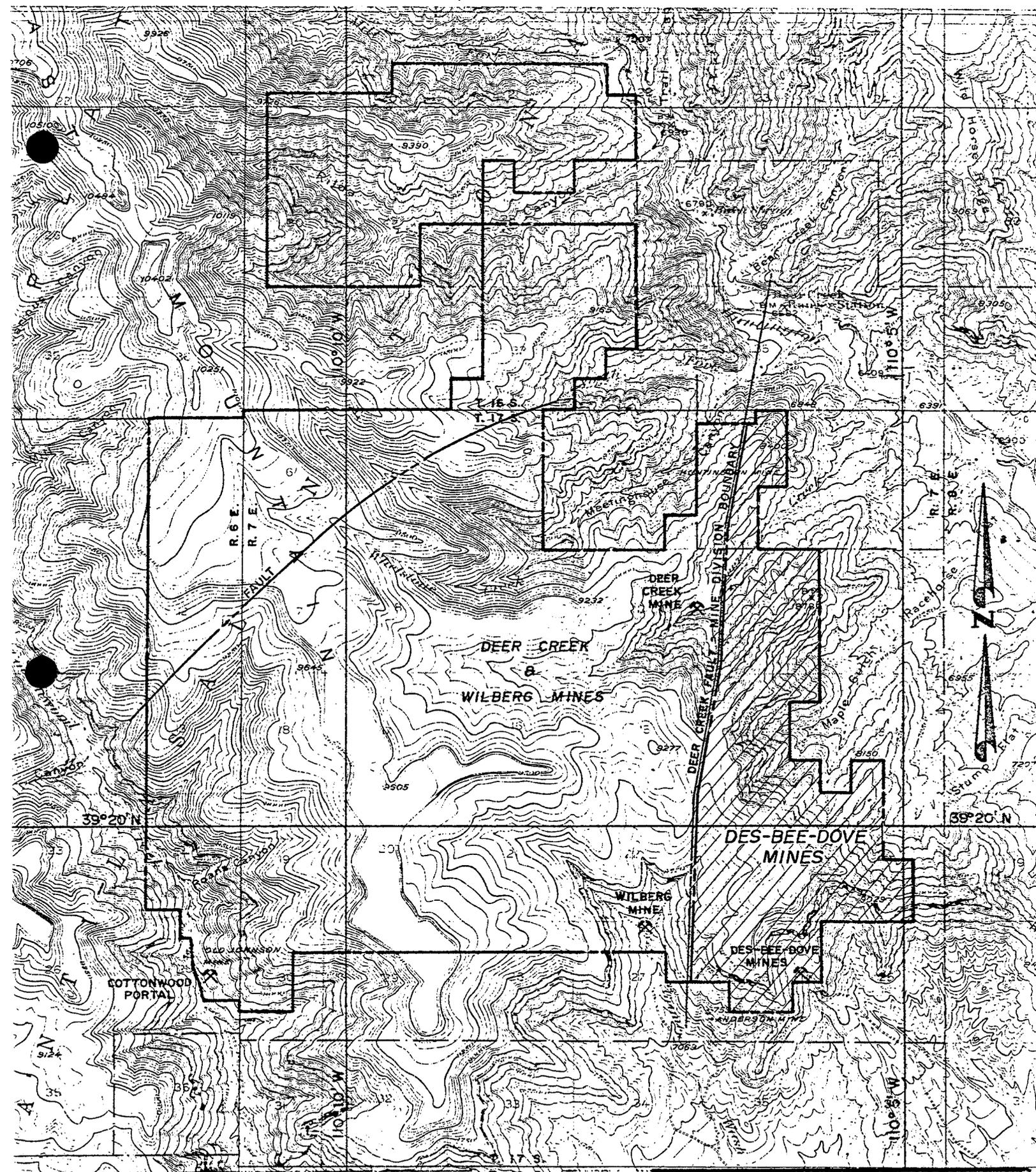
Mining began as early as 1898 in the unnamed canyon where the Des-Bee-Dove Mine is located. The old original mine workings, called the Griffith Mine, were limited in extent due to the rugged terrain and poor access. The Griffith workings were purchased in 1936 by two men, Edwards and Broderick, who fashioned a crude access road and mined until 1938.

Castle Valley Fuel Company purchased the Edwards and Broderick property in 1938. The L.D.S. Church purchased coal lands adjacent to Castle Valley Fuel Company in 1938 and began their own operations in that year.

The Church Mine operated under contract to a Mr. Killian of Orangeville until it was closed in 1943 due to World War II. Castle Valley Fuel Company continued to operate until 1947. The L.D.S. Church purchased Castle Valley Fuel's operation in 1947 and combined operations to form Deseret Coal Company, a church welfare project.

Deseret Coal Company continued operations until Utah Power & Light Company acquired it in 1972.

Mining takes place in three main portals, Deseret, Beehive, and Little Dove. Hence the name Des-Bee-Dove Mine. Mine personnel and coal handling facilities are combined to service all three portals. Mine location is shown on Figure 1.



- - - - - EXISTING PERMIT BOUNDARY
 MINE AREA

DES-BEE-DOVE COAL MINES		
EMERY COUNTY, UTAH		
PERMIT AREA MAP		
UTAH POWER & LIGHT COMPANY	SCALE: 1:62500	DATE: JAN. 9, 1981
	FIGURE 1	

Two minable seams exist in the Des-Bee-Dove Mine area. Hiawatha (lower) Seam is mined through Deseret portal. Blind Canyon (upper) Seam is mined through Beehive and Little Dove portals. Approximately 1,050 acres of minable coal remain accessible in Blind Canyon Seam from Des-Bee-Dove Mine. Hiawatha Seam contains approximately 1,275 acres of minable coal reserve remaining accessible.

The anticipated Des-Bee-Dove life-of-mine production is near 11.1 MM tons. This anticipated production will be obtained by utilizing five continuous mining units, which are presently operating.

The basic Des-Bee-Dove mining plan consists of a system of mains and sub-mains connecting a series of room-and-pillar continuous mining sections. Relatively short mine life and limited remaining minable reserves discount the economics of applying alternate mining methods.

Extracted coal is sized in the Des-Bee-Dove coal handling facility and trucked predominantly to the Utah Power & Light - Hunter Power Plant, approximately 11 miles.

Utah Power & Light Company has undertaken an extensive study to determine the impacts and benefits of a coal washing facility. A final economic justification is yet to be determined. Results of the study will be submitted to the regulatory authority when they are complete.

MINING PLAN (784.11)

The Des-Bee-Dove mining plan is based on the geologic information outlined in Geology Description. Good knowledge of the entire property is available from the outcrop and drilling. Detailed knowledge of a smaller part of the property is known from mining operations.

The mining areas are bounded by natural and imposed limits with varying degrees of confidence as to location and extent:

- Lease boundaries - definitely located and invariable in the short term
- Faults - may vary somewhat from currently assumed locations
- Stratigraphic thinning (pinchouts) - mining limits may vary hundreds of feet as information becomes available and as mining recovery economics and practicality are studied further.
- Underground burned areas - from a practical point of view are indeterminate prior to mining.

Permit boundary and approximate locations of faults affecting the Des-Bee-Dove Mine plan are illustrated in Maps 3-1 and 3-2. Faults influencing the mining plan are Maple Gulch Fault, Deer Creek Fault, and Bear Creek Canyon Fault.

Mining limits in Blind Canyon Seam include the 5' seam thickness. The underground mining machines now employed in the Des-Bee-Dove Mine are, by design, limited to

a 5' coal seam. The Blind Canyon 5' thickness roughly parallels the Little Dove main entries for approximately $\frac{1}{2}$ mile and effects only a small portion of the overall reserve. The northern extent of mining in Hiawatha Seam will be determined by either 5' seam thickness or underground burned area. The interburden in the minable area where the two seams overlap varies from 70 to 120 feet.

Since mining through Deseret portal is overlain by Beehive and Little Dove mining, detailed scheduling has been undertaken to ensure that the upper seam is mined prior to the mining of the lower seam while still following good mining practices in generating the mine layout.

The mine layout, as illustrated in Maps 3-1 and 3-2 is an arrangement of room-and-pillar sections interconnected by a system of six-entry mains and sub-mains. This arrangement is predicated on geographical dedication of reserves and available geologic information. Better knowledge of the geology and quality parameters of the coal reserve through additional drilling, mine development work, and continued operating experience at Hunter Power Plant will influence mining techniques and mine plans.

The most recent mine plan comprises 2 sets of main entries, 4 sets of sub-main entries, and 38 room-and-pillar sections. The planned extraction sequence accommodates Beehive and Little Dove first. The sequence of mining at Des-Bee-Dove is shown on Maps 3-1 and 3-2.

Room-and-pillar sections are to be extracted in the order listed in Tables 1 thru 5. Approximate dates for these extractions are also listed. Section identifications in Tables 1 thru 5 refer directly to those shown on the mining plans. Pillars in mains and sub-mains will be extracted as needed to ensure maximum efficient extraction of the minable reserve.

Plans for roof control, ventilation system, and methane and dust control have been submitted to MSHA and are in the appendix.

TABLE 1

DES-BEE-DOVE MINE
TIMING FOR UNIT #1

<u>Section</u>	<u>Start</u>	<u>End Advance</u>	<u>End Retreat</u>
12 East	2 1 1981	2 18 1981	
12 East No.	2 18 1981	4 2 1981	
12 East	4 2 1981	7 1 1981	
1 Right	7 1 1981	9 26 1981	3 4 1982
1 Left	3 4 1982	4 26 1982	8 18 1982
12 East	8 18 1982		10 23 1982
12 East No.	10 23 1982		12 15 1982
12 East	12 15 1982		12 1 1983
2 North	12 1 1983		12 24 1985
1-2 No Con	12 24 1985		1 9 1986
1 North	1 9 1986		2 23 1986
1 Left	2 23 1986	4 3 1986	6 3 1986
1 North	6 3 1986		7 18 1986
2 Left	7 18 1986	8 29 1986	10 26 1986
9 West	10 26 1986		1 29 1987
10 East	1 29 1987		5 11 1987
Main North	5 11 1987		6 29 1988

TABLE 2

DES-BEE-DOVE MINE
TIMING FOR UNIT #2

<u>Section</u>	<u>Start</u>	<u>End Advance</u>	<u>End Retreat</u>
6 West	2 1 1981	2 7 1981	7 26 1981
5 North	8 11 1981	7 9 1983	12 18 1990
Main West	12 18 1990		5 13 1991

TABLE 3

DES-BEE-DOVE MINE
TIMING FOR UNIT #3

Unit 3 is with Unit 5 in Little Dove 1 North. Following this joint advance, Unit 3 will move to the Beehive Mine.

<u>Section</u>	<u>Start</u>	<u>End Advance</u>	<u>End Retreat</u>
9 West Bee	2 5 1982	4 6 1982	
8 West Bee	4 8 1982	6 4 1982	10 30 1982

This Unit will now move to the Deseret Mine.

9 West Des	11 14 1982	3 9 1983	9 6 1983
12 East	9 22 1983	12 13 1983	3 27 1984
11 East	4 4 1984	7 9 1984	11 2 1984
10 East	11 9 1984	1 7 1985	3 13 1985
14 East	3 21 1985	4 14 1985	5 28 1985
2 North	5 28 1985		8 14 1985
1N-2N Con	8 14 1985		9 3 1985
1 Left	9 3 1985	10 15 1985	11 25 1985
1 North	11 25 1985		12 7 1985
2 Left	12 7 1985	1 15 1986	3 3 1986
1 North	3 3 1986		4 2 1986
10 West	4 2 1986		8 9 1986
2 Left	8 9 1986	10 1 1986	12 10 1986
9 East	12 10 1986		1 1 1987
Main North	1 1 1987		9 16 1987
1N-MN Con	9 16 1987		12 12 1987
1 North	12 12 1987		2 7 1988
1 Right	2 7 1988	3 12 1988	
Main North	3 12 1988		3 16 1988
1 Right	3 16 1988		5 12 1988
1 Left	5 13 1988	8 21 1988	12 9 1988
2 Right	12 10 1988	1 19 1989	
Main North	1 19 1989		1 29 1989
2 Right	1 29 1989		4 17 1989
2 Left	4 18 1989	6 26 1989	11 14 1989
3 Right	11 15 1989	12 24 1989	
Main North	12 24 1989		1 3 1990
3 Right	1 3 1990		3 28 1990
4 Right	3 29 1990	5 9 1990	
Main North	5 9 1990		5 27 1990
4 Right	5 27 1990		9 15 1990
3 Left	9 16 1990	12 9 1990	5 10 1991
1 North	5 10 1991		8 22 1991

TABLE 4

DES-BEE-DOVE MINE
TIMING FOR UNIT #4

<u>Section</u>	<u>Start</u>	<u>End Advance</u>	<u>End Retreat</u>
7 West	2 1 1981	8 6 1981	9 3 1981
8 West Des	9 10 1981	1 18 1982	8 4 1982
10 West	8 19 1982	12 25 1982	
1 North Des	12 25 1982	2 28 1983	
11 West	2 28 1983	3 29 1983	
2 North	3 29 1983	8 3 1983	
13 East	8 3 1983	10 6 1983	12 25 1983
6 East	1 10 1984	4 21 1984	9 22 1984
7 East	9 29 1984	1 15 1985	6 12 1985
8 East	6 20 1985	9 29 1985	1 25 1986
9 East	2 2 1986	4 23 1986	
1 Left	4 23 1986	6 24 1986	10 10 1986
9 East	10 10 1986		11 6 1986

This Unit will now move to the Little Dove Mine.

3 North	11 21 1986	5 6 1987	
1 Left	5 6 1987	7 3 1987	8 12 1987
2 Left	8 13 1987	10 17 1987	2 4 1988
1 Right	2 5 1988	3 17 1988	
Main North	3 17 1988		4 10 1988
1 Right	4 10 1988		7 11 1988
2 Right	7 12 1988	8 26 1988	
Main North	8 26 1988		9 3 1988
2 Right	9 3 1988		11 6 1988
3 Left	11 6 1988	1 11 1989	6 17 1989
3 Right	6 18 1989	8 10 1989	
Main North	8 10 1989		8 18 1989
3 Right	8 18 1989		10 22 1989
4 Right	10 23 1989	11 29 1989	
Main North	11 29 1989		12 5 1989
4 Right	12 5 1989		1 30 1990
4 Left	2 1 1990	4 5 1990	7 18 1990
5 Right	7 19 1990	8 27 1990	
Main North	8 27 1990		9 4 1990
5 Right	9 4 1990		12 4 1990
Main West	12 4 1990		1 15 1991

TABLE 5

DES-BEE-DOVE MINE
TIMING FOR UNIT #5

Unit 3 is with this Unit.

<u>Section</u>	<u>Start</u>	<u>End Advance</u>	<u>End Retreat</u>
1 North LD	2 1 1981	1 20 1982	

Unit 3 will now move to the Deseret Mine.

1 North	1 20 1982		8 7 1990
Main West	8 7 1990		11 1 1990

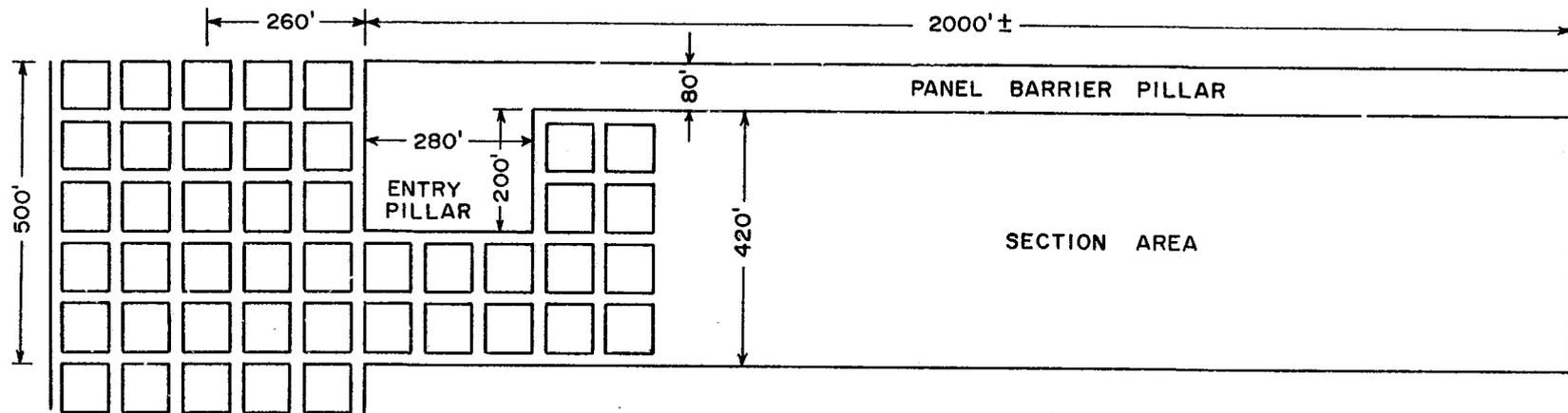
MINING METHOD

Des-Bee-Dove mining is limited strictly to room-and-pillar methods employing continuous mining units.

Figure 2 illustrates the basic configuration of the main entries. A six-entry system is planned for the main headings with openings driven 20 feet wide on 100 foot centers. The pillars created thereby measure 80 feet by 80 feet, a size which, in the past, has proven sufficient to support the overlying strata.

For development of room and pillar sections at Des-Bee-Dove Mine, three entries will be opened on advance with two or more developed on retreat in conjunction with pillar extraction. Openings are 20 feet wide on 100 foot x 100 foot centers. The sequence of pillar recovery is shown in Figure 3 (near the end of advance and beginning of retreat and pillaring). Figure 4 illustrates the cut sequence across a pillar row and Figure 5 shows in detail the method planned for recovering individual pillars.

Figure 6 indicates that 60% pillar recovery, leaving a foot of top coal, results in just over 50% coal recovery for configuration planned at Des-Bee-Dove.



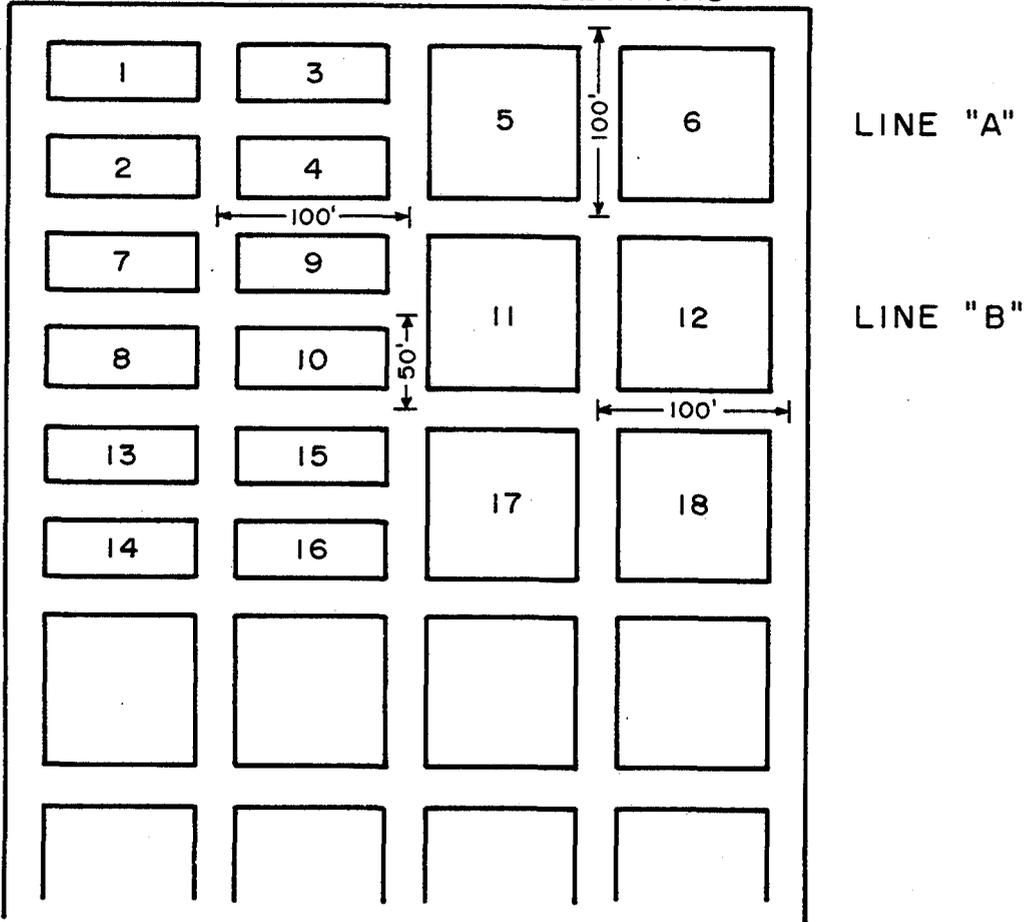
MAIN ENTRY AREA
ASSOCIATED WITH A GIVEN PANEL

FIGURE 2

CONFIGURATION OF EXTRACTION PLAN FOR
ROOM AND PILLAR SECTIONS AT DES-BEE-DOVE MINE

SCALE 1" = 300'

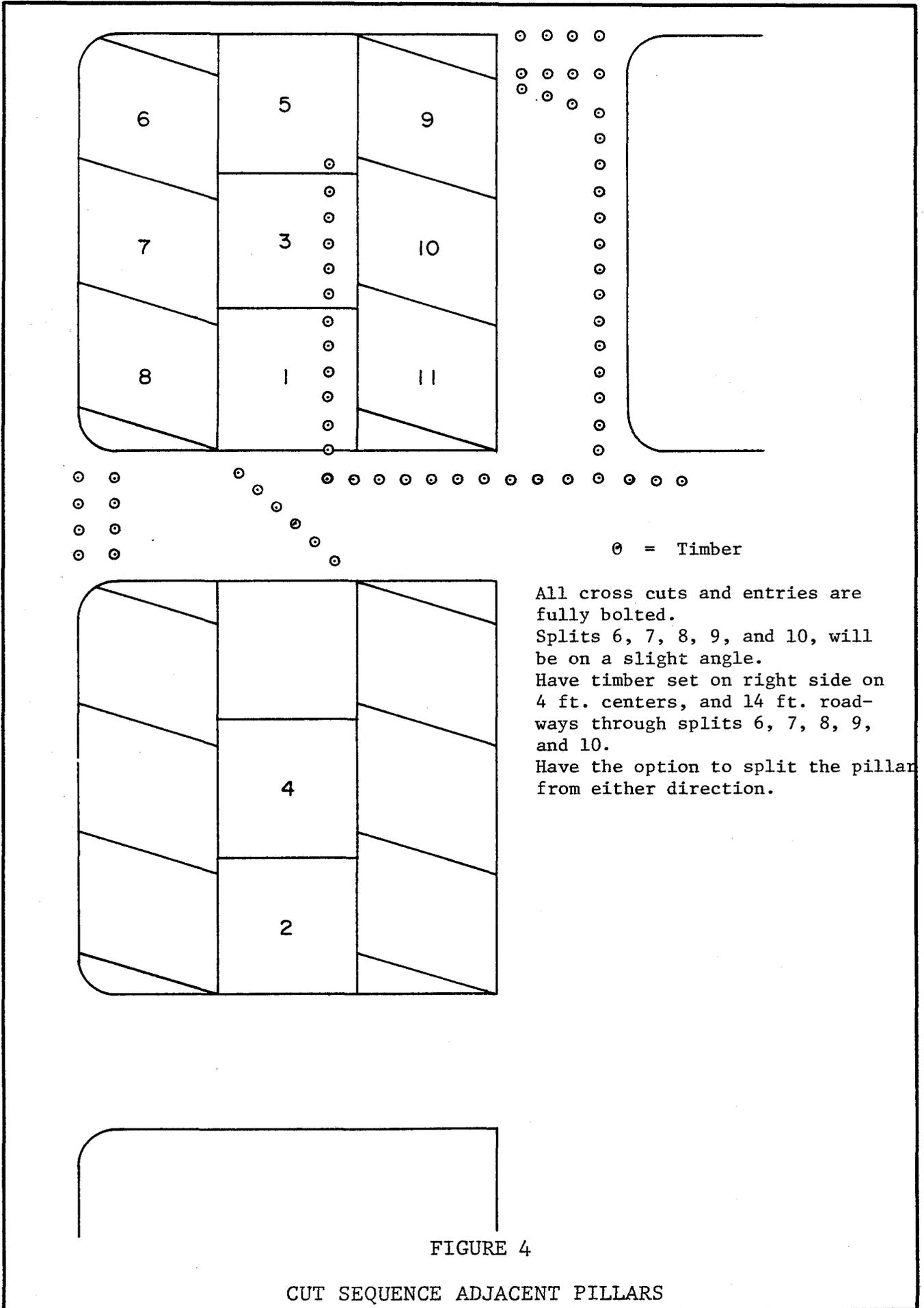
END OF ROOM & PILLAR SECTIONS



Pillars in Line A will be recovered first, starting at pillar #1 going to #6. Then the pillars in Line B will be recovered.

FIGURE 3

SEQUENCE OF PILLAR RECOVERY

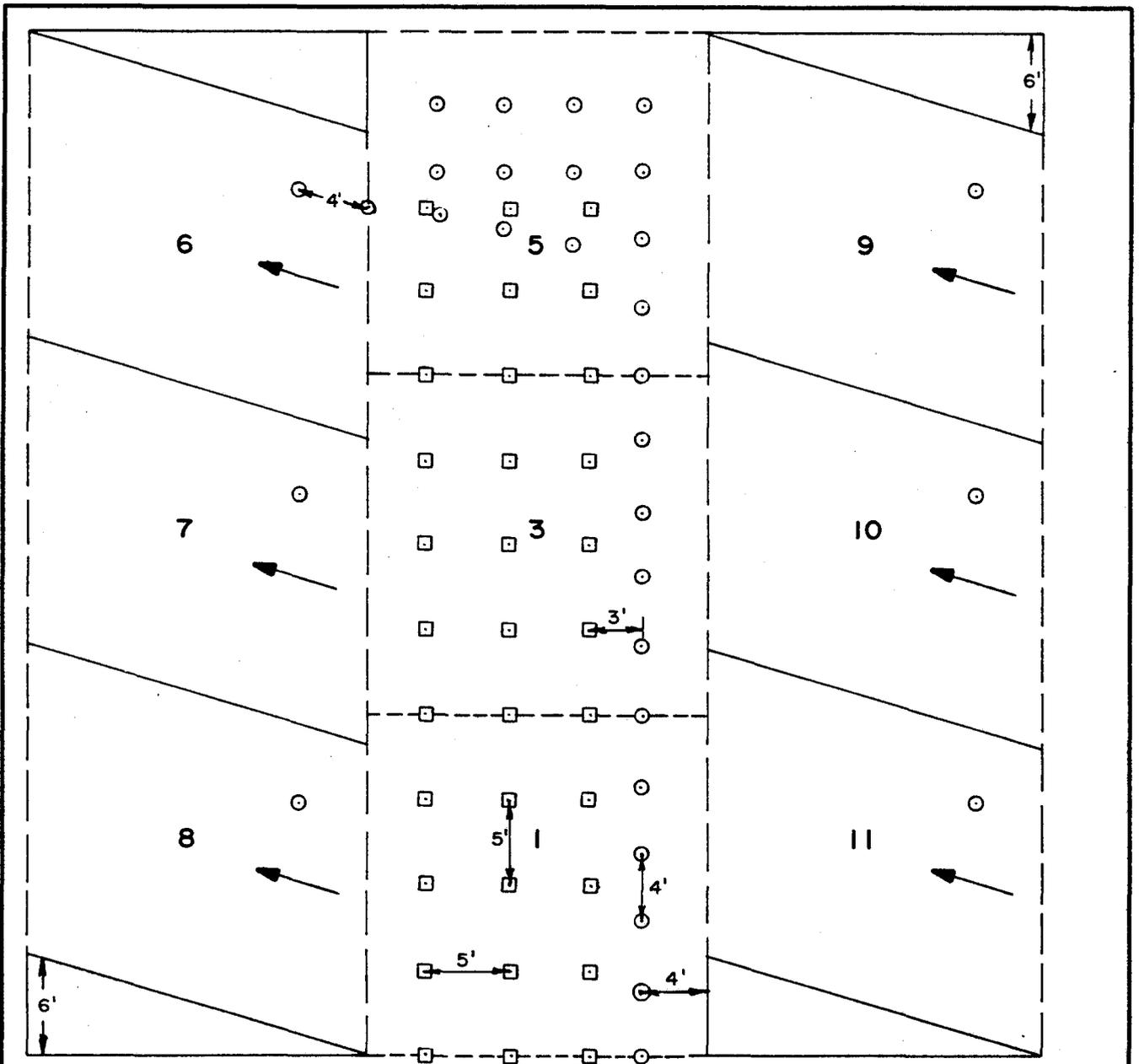


⊙ = Timber

All cross cuts and entries are fully bolted.
 Splits 6, 7, 8, 9, and 10, will be on a slight angle.
 Have timber set on right side on 4 ft. centers, and 14 ft. roadways through splits 6, 7, 8, 9, and 10.
 Have the option to split the pillar from either direction.

FIGURE 4

CUT SEQUENCE ADJACENT PILLARS

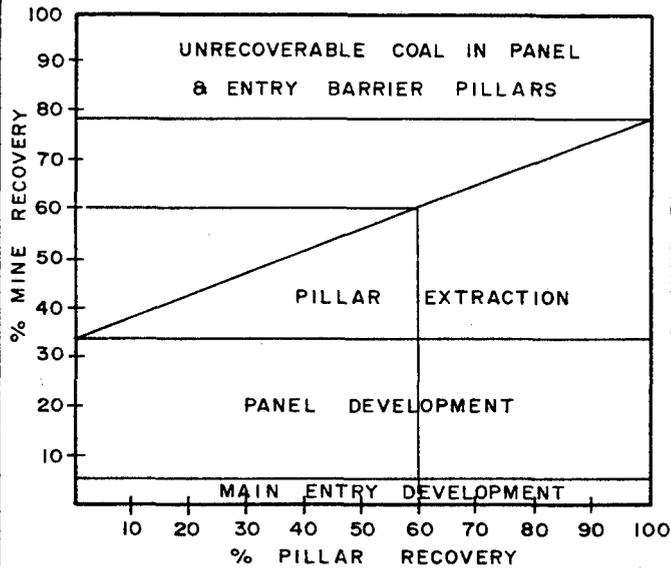


○ Bolt
 ○ Timber
 Scale 1" = 10'

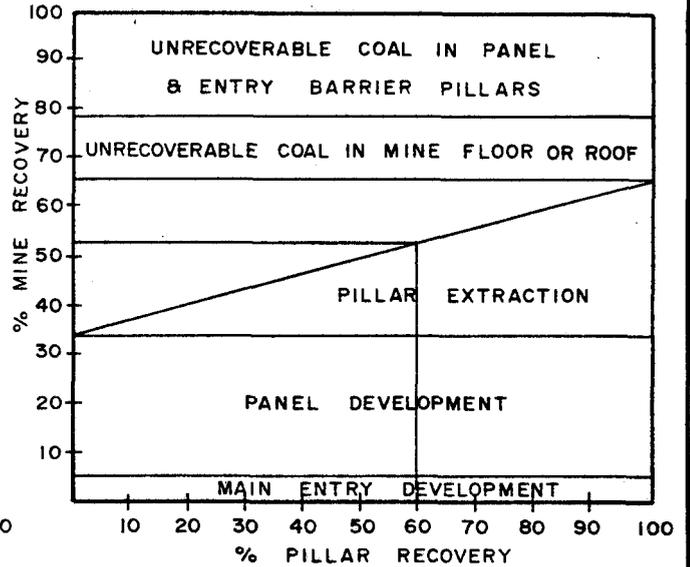
Bolts are 3' from timber that are set on right side of first split. The reason for this is because it is not feasible to remove timbers in a pillar split.
 All entries and crosscuts are fully bolted.
 The last 10' of the last cut (5) in the first split will not have to be bolted.
 Have turn timbers on 4' centers on each push through.
 Timbers set on 4' centers for whatever it takes to break through, not to exceed 12' from last row of bolts.
 Miner cab not to exceed timber.

FIGURE 5

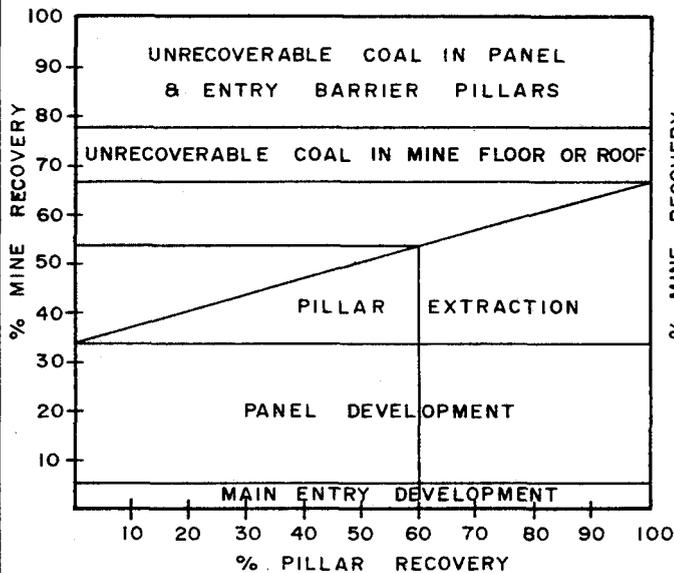
DETAIL OF RECOVERING INDIVIDUAL PILLARS



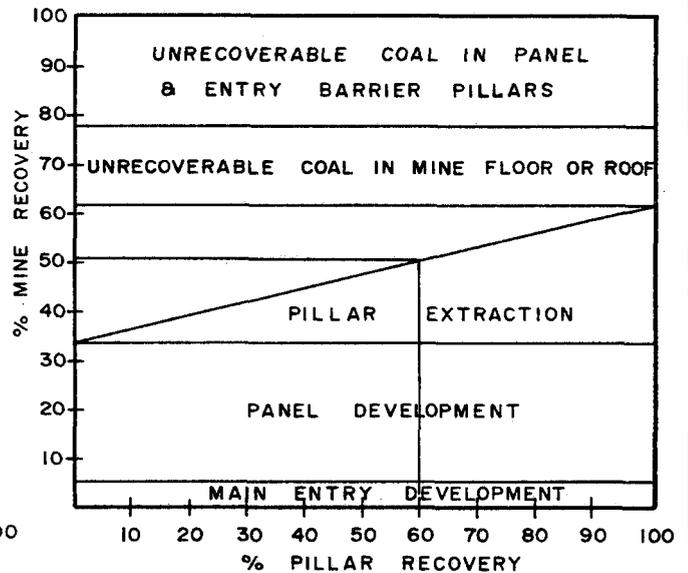
FULL SEAM MINING



6' MINING IN 7' SEAM



8' MINING IN 9' SEAM



10' MINING IN 12' SEAM

FIGURE 6

RELATIONSHIP OF OVERALL MINE RECOVERY TO
PILLAR RECOVERY BASED UPON THE SYSTEMATIC
EXTRACTION PLAN FOR THE DES-BEE-DOVE MINE

MINE PRODUCTION

Mine production is based on an annual requirement of 1.1 MM tons from Des-Bee-Dove Mine. Production requirements are fulfilled by employing five continuous miner units working 235 days per year at an average individual production rate of 500 tons per machine shift. Individual unit production rates vary from the average depending on mining conditions, seam thickness, and operational mode. (Operational modes include: 1) development advance, 2) production advance, and 3) production retreat.) Table 6 shows the anticipated annual and total production for Des-Bee-Dove Mine.

Total in-place reserves within Des-Bee-Dove Mine's boundaries are approximately 23,600,000 tons. Estimated overall minable reserve recovery is 48%.

TABLE 6

DES-BEE-DOVE MINE
ANTICIPATED ANNUAL AND TOTAL PRODUCTION

<u>Year</u>	<u>Tons</u>
1981	1,044,000
1982	1,113,000
1983	1,145,000
1984	1,136,000
1985	1,176,000
1986	1,172,000
1987	1,183,000
1988	1,063,000
1989	945,000
1990	905,000
1991	251,000

TOTAL PRODUCTION = 11,133,000 Tons

MINE EQUIPMENT

Many pieces of major underground ancillary equipment are utilized at Des-Bee-Dove Mine to promote safe and efficient operation of the continuous mining units.

Des-Bee-Dove Mine is a trackless mine. Men and materials are delivered by rubber-tired diesel tractors and mantrips throughout the mine. All principal in-mine haulage of coal is by belt conveyor. Of the six entries in the main entry systems, one entry is dedicated mainly to conveyor and one to roadways for diesel haulage.

Table 7 lists the major ancillary equipment used in Des-Bee-Dove Mine.

TABLE 7

DES-BEE-DOVE MINE - MAJOR UNDERGROUND ANCILLARY EQUIPMENT

Continuous Mining Units

General Mine

6 - Continuous Miners	10 - Compressors
11 - Shuttle Cars	19 - Transformers
12 - Scoops	52,240' - 42" Conveyors
7 - Roof Bolters	20,800' - 36" Conveyors
34 - Rock Dusters	33 - Conveyor Drives
9 - Power Centers	6 - Foam Generators
7 - Feeder Breakers	8 - Welders
	12 - Battery Chargers
	11 - Diesel Personnel Tractors
	11 - Diesel Mantrips
	38 - Material and Equipment Trailers
	9 - Diesel Material Tractors
	13 - Tool and Material Carts

ENGINEERING PRINCIPLES AND TECHNIQUES

A variety of engineering principles and techniques are applied in the Des-Bee-Dove Mine operation. Principles of engineering employed are those associated with standard prudent mine engineering practice. Employment of knowledgeable, experienced personnel makes application of such principles possible. Engineering design techniques include computer simulation of coal extraction, ventilation, and pumping systems, along with research and testing in rock mechanics and subsidence.

Long range mine planning by computer simulation plays an important role in design. Computer simulation of coal extraction assists the engineers in projecting annual tonnages and sequencing extraction in sections. Computer based long range planning helps to maximize annual production and better utilize continuous mining units. The two seam nature of the property and consequent need to extract upper seam sections in advance of lower seam sections increases the value of these simulations.

Ventilation and dust suppression are essential in underground mining operations. Delivering air and water from their respective sources to fulfill these needs can become complicated in a large operation. Simulations of ventilation and hydraulic networks play a significant role in planning for future needs and installing systems for delivery. Des-Bee-Dove Mine planning includes these ventilation and hydraulics simulations.

Rock mechanics studies are a necessary part of mine planning. The long-term stability of the entries directly affects mine integrity as well as a protection of property and mine production. Beehive Mine was the site of a U. S. Bureau of Mines sponsored study to measure the behavior of pillars under the effects of an approaching cave line. Results from this program, combined with on-going stress testing, indicates the possibility of reducing pillar size without significant stress increase. If this proposition proves valid, a greater proportion of coal can be extracted on development and overall resource recovery would be improved. Such changes in section widths and spacing should be coordinated with the main entry pillar spacings (and/or sizes) to effect straight line belt haulage from the sections to the mains while obviating the need to "trim" main entry pillars.

The determination of rock strengths and elastic parameters has been in progress since November 1976 by mechanically testing cores taken from roof and floor formations. Holes are drilled upward or downward from the entries existing within the Des-Bee-Dove Mine. Rock mechanics properties are being interpreted and used primarily in assessing the caveability of the overburden.

MINE FACILITIES

Introduction

Des-Bee-Dove Mine facilities are located on 18 acres in an unnamed wash on the perimeter of East Mountain. The natural terrain is rocky, dry and very steep with moderate vegetation. Surface facilities include the following: sediment pond, earthen structures, coal stockpile, tipple, facility conveyors, parking lot, office-bathhouse-warehouse, underground shop, materials storage areas, access and service roads, mine ventilation fans, power supply and substation, potable water system, sewer treatment system, and drainage systems.

Specific locations of mine facilities are shown on Maps 3-3A and 3-3B.

All facility plans are on file at Utah Power & Light Company - Department of Mining and Exploration, 41 North Redwood Road, Salt Lake City, Utah. They are available for public inspection. Facility photographs are included in the Existing Structures Section.

With the exception of roads and conveyors, a narrative follows explaining the construction, use, maintenance, and removal of the aforementioned facilities.

DAMS, EMBANKMENTS, AND OTHER IMPOUNDMENTS

Sediment Pond -- A pond has been designed and constructed for sediment control at Des-Bee-Dove Mine. The pond design capacity is 19.4 acre-feet, 1.8 acre-feet for sediment, 17.4 acre-feet for runoff, and 0.2 acre-feet free board. The pond design will impound runoff from the 10 yr.-24 hr. detention period. A grouted rip-rap spillway is installed in the dam to provide controlled release of runoff from storms in excess of the 10 years/24 hr. precipitation event.

Construction and design of the ponds were under the direction of a registered professional engineer. Details of pond construction are included in Existing Structures.

Slopes constructed on fill have been revegetated to minimize erosion.

Maintenance of the sediment ponds includes quarterly inspections and discharge monitoring. Copies of inspection reports by a registered professional engineer are submitted to the Division following inspection. Des-Bee-Dove sediment pond has not discharged since its installation. The pond will be dredged of sediment when sediment volume is 60% of design capacity.

Reclamation of the pond will complete the proposed Des-Bee-Dove reclamation process. The pond will be allowed to dry followed by backfilling and grading. Graded contours will be compatible with the natural surroundings. Revegetation will be performed as outlined in Reclamation Plan.

Earthen Structures -- Five major earthen structures are utilized at Des-Bee-Dove Mine for support of facilities. They are identified as follows:

- 1) Tipple Area Structure
- 2) Bathhouse Area Structure
- 3) Coal Stockpile Structure
- 4) Deseret Portal Structure
- 5) Beehive Portal Structure

Construction details of earthen structures are included in Existing Structures.

Largest of the earthen structures is the tipple area structure providing 4.1 acres of working area. Tipple, material storage, fuel facility, auxiliary coal stockpile, and access road are supported by this structure.

The bathhouse area structure occupies 2.1 acres and supports office-bathhouse-warehouse, parking lots, and material storage shed. This structure is mostly asphalt surfaced.

Less than $\frac{1}{2}$ acre is occupied by the coal stockpile structure. Short term stockpiles are repeatedly constructed here for surge control of the run-of-mine product.

Deseret portal structure, mostly cut and some fill, is founded on the Starpoint Sandstone. This 0.9 acre structure supports Deseret #1 ventilation fan, main substation, rock dust silo, coal transfer structure, conveyors, stacking tube (utilized as a coal transfer), main substation, material storage, fuel facility, trash bin, and portal access road.

Beehive portal structure occupies 1.1 acres and supports material storage, Little Dove conveyor, a coal transfer structure, Little Dove ventilation fan, a trash bin, and a fuel facility.

Some small road cut structures are utilized for support of the culinary water storage tank, Beehive ventilation fan, Deseret #2 ventilation fan, secondary substation, and auxiliary water storage.

Maintenance of the structures is minimal. Periodic inspections will be made to observe changes in stable structure condition. Resurfacing of parking areas and regrading of graveled surfaces will be done as needed. Surface drainage structures will be inspected and cleaned as needed to ensure proper drainage and promote stability.

Details of earthen structure reclamation are included in Reclamation Plan.

Overburden and Topsoil Handling and Storage

At present, no facilities exist specifically for overburden and topsoil handling and storage at Des-Bee-Dove Mine. All overburden removed in the mine area has been utilized as construction material for earthen fill structures.

Coal Handling Facilities

Des-Bee-Dove coal handling system is designed to collect coal on a conveyor and transfer system and prepare three separate facility products. A description of the coal handling system follows. Components of the coal handling system are shown on Maps 3-3A and 3-3B.

Facility Conveyors -- All facility conveyors are separately identified and discussed in Transportation Facilities.

Transfer Structures -- Three separate transfer structures are utilized in the Des-Bee-Dove coal handling system.

The 16" x 0" run-of-mine product from Little Dove Mine is conveyed approximately 100' to a transfer structure which passes the coal to a 150' long inclined conveyor.

An 80' stacking tube arrangement is utilized to transfer Little Dove coal to the Deseret portal area for transfer to the coal stockpile. The stacking tube transfer collects run-of-mine coal from the 150' inclined conveyor and delivers to a concrete surge bunker at the base of the tube. Coal is reclaimed via two vibratory feeders at the base of the bunker for transport to the Deseret portal transfer structure.

Deseret portal transfer structure receives run-of-mine product from Deseret portal and Little Dove portal. Coal flow is diverted past an adjustable flop gate onto main and/or auxiliary coal stockpile feed belts.

All transfer structures are steel frame construction on concrete foundations.

Standard mechanical maintenance procedures are applied on transfer structures to ensure smooth operation. Transfer chutes are enclosed and inlets and outlets are rubber curtained to minimize contribution of fugitive dust.

All transfer structures will be dismantled and sold for salvage or scrapped during reclamation. Concrete foundations will be removed, broken up, and used for coarse backfill.

Coal Surge Bin and Stockpile -- Coal is collected from the main stockpile feed conveyor in an 800 ton capacity coal surge bin which delivers directly to a reclaim feeder. The surge bin automatically overflows into auxiliary storage adjacent to the bin.

Run-of-mine product is diverted out the auxiliary stockpile feed conveyor for further stockpiling when the overflow stockpile is filled. Maximum coal stockpile capacity is 10,000 tons. Coal is moved to a reclaim feeder by rubber-tired front-end loader. Stockpiles are usually depleted within one month of original placement.

Maintenance of the stockpile area is minimal. Coal stockpiles are moved and cleaned up as soon as possible to minimize chance of spontaneous combustion. Drainage ditches are kept clear to ensure adequate drainage of the stockpile area.

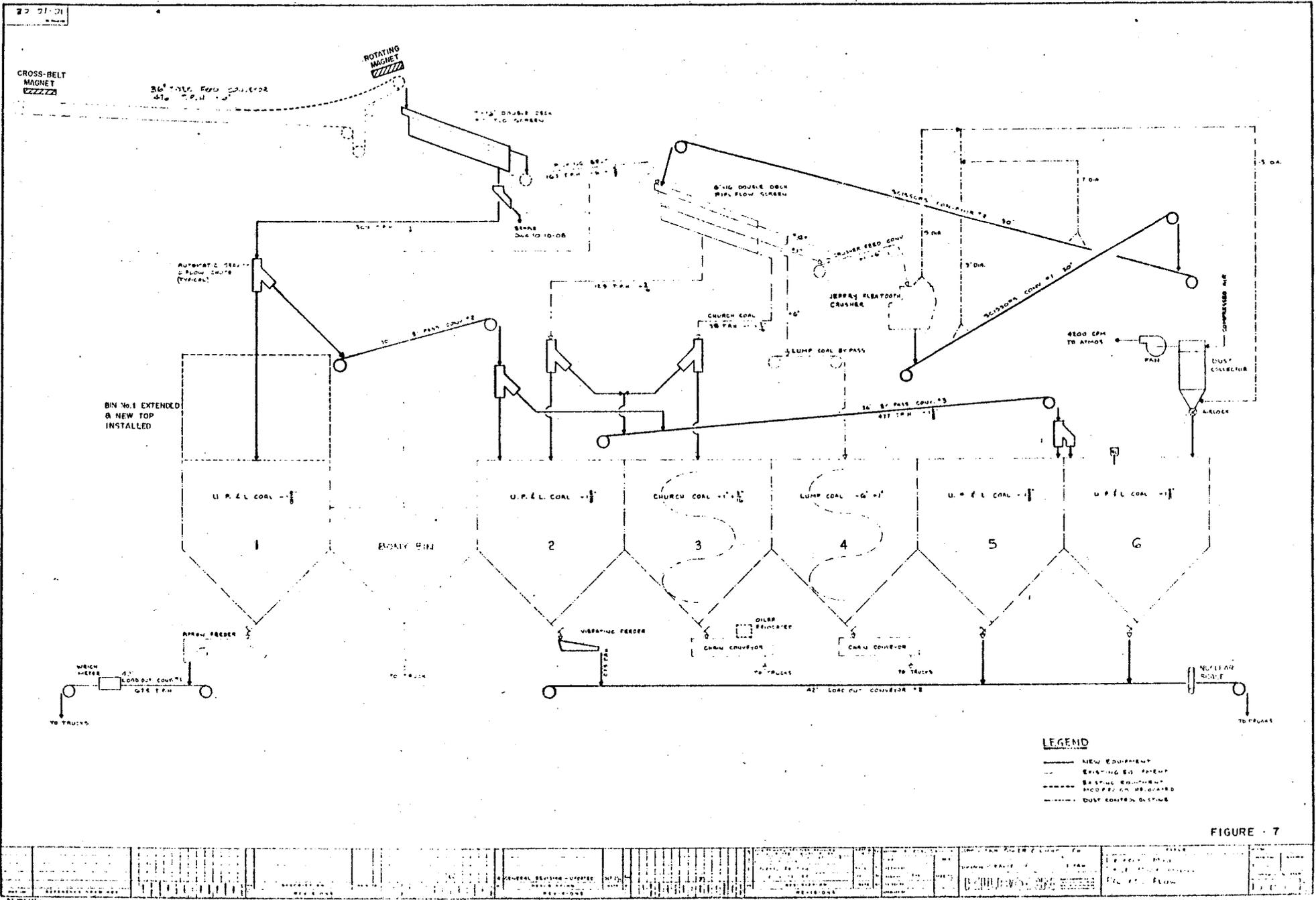
Prior to final reclamation, all coal will be cleared from the stockpile area. The concrete surge bin will be demolished and used for coarse backfill. The earthen structure supporting the stockpile will be reclaimed as detailed in Reclamation Plan.

Coal Reclaim and Sizing -- A single vibratory feeder is utilized to reclaim coal from the short-term stockpile onto a 36" tipple feed conveyor. The run-of-mine product passes two tramp iron magnets before entering the tipple for screening, sizing, and separating. The tipple sizing and separating circuit is illustrated in Figure 7.

Run-of-Mine coal is screened of -1 5/8" size before crossing a picking table. Rock and trash are picked from the product stream on the picking table and separated. Rock drops to a bony bin and trash is swept to a trash pile beneath the tipple. The -1 5/8" size coal is delivered to a power plant feed bin (bin #1 on Figure 7).

Lump coal (+6") is screened from the product stream and collected in a lump coal bin or delivered for further crushing. All +1" coal from the second tipple screen (double-deck) and excess lump coal are fed through a Jeffry Flextooth Crusher and recirculated to the double deck screen for further separation.

Two products are collected from the double-deck screen and removed from the product stream. Minus 3/16" size is delivered to a plant feed product bin (bin #2 on Figure 7). Minus 1" to plus 3/16" size is collected for L.D.S. Church stoker coal or diverted to plant feed bins when the stoker coal bin (#3 on Figure 7) is full.



LEGEND

- NEW EQUIPMENT
- - - EXISTING EQUIPMENT
- BASTING EQUIPMENT
- SMOOTHS ON BELT-GUARD
- DUST CONTROL DEVICE

FIGURE - 7

NO.	DESCRIPTION	DATE	BY	REVISION
1	GENERAL DESIGN - ADAPTED	11/21/54
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50

All product bins are installed with overflow bypass systems except the lump coal bin. Using the identification number of Figure 7, bin #1 overflows to bin #2. Bins #2 and #3 overflow to bins #5 and #6.

Bin #1 which collects power plant feed product (-1 5/8") holds 285 tons maximum. All other bins, including the bony (waste rock) bin, hold a maximum 160 tons.

Plant products are generally gravity fed from the bins and conveyed out the base of the tipple into trucks for transport to various destinations. Power plant feed (-1 5/8") is trucked predominantly to UP&L-Hunter Power Plant. Some power plant feed is trucked from Des-Bee-Dove Mine to UP&L's Hale and Carbon Power Plants. Lump coal (+6") is sold to employees or to the L.D.S. Church. Stoker coal is sold to the L.D.S. Church.

Tipple construction is steel frame. Most tipple components are metal construction. Standard building maintenance procedures are applied on the tipple to promote safety and utility. Standard mechanical maintenance procedures are followed to ensure smooth operation and long life of moving parts.

During reclamation, the tipple will be dismantled. Metal and mechanical parts will be sold for salvage or scrapped. Concrete foundations will be broken up and used for coarse backfill.

When insufficient trucks are available to adequately deplete the run-of-mine coal stockpile, tippie processed coal is released and placed in a stockpile in the tippie yard. The tippie yard stockpile has a maximum capacity of 8,500 tons. Coal is stockpiled here only temporarily for periods less than a week. Coal is loaded from the stockpile by rubber-tired front-end loader.

The tippie yard stockpile requires no maintenance.

All coal will be removed from the tippie area prior to reclamation. Details of tippie area reclamation are included in Reclamation Plan.

Waste Rock and Non-Coal Waste Disposal

Plans for Underground Development Waste Rock disposal were submitted to OSM on December 31, 1980. Approval is pending. A copy of waste rock disposal plans for Des-Bee-Dove Mine were submitted to the Division and are included in the appendix.

Non-coal waste is hauled from the mine and placed in concrete trash bins near the mine portals. Two concrete bins are utilized at Des-Bee-Dove Mine. Locations of these bins are shown on Maps 3-3A and 3-3B. Trash is removed from the coal product stream and stacked in a pile beneath the tippie.

Non-coal wastes are collected periodically from the trash bins and tippie trash pile and disposed of in a State approved disposal area.

The trash bins require no maintenance.

During reclamation, concrete trash bins will be broken up and used for coarse backfill.

Other Mine Facilities

Office - Bathhouse - Warehouse -- A 210' x 80' steel frame building is utilized for office, bathhouse, and warehouse facilities at Des-Bee-Dove Mine. The basic building construction consists of steel reinforced concrete floor, pre-fab steel framing, and heavy gauge aluminium exterior (walls and roof).

Approximately 3,200 sq. ft. are occupied by offices for administrative, clerical, safety, and engineering personnel. Office area interior consists basically of wooden stud framing, sheet rock and wood paneled walls, linoleum floors, and acoustical tile ceilings.

The bulk of the building (8,800 sq. ft.) is dedicated to bathhouse space which includes showers, lockers, bathrooms, and lamp room facilities for miners and supervisors. Interior is basically concrete block walls, bare concrete floors, and open ceilings.

The remaining 4,800 sq. ft. of building space is utilized for storage of small parts, materials, and machinery requiring cover and security.

Standard building maintenance procedures are followed to maintain the office-bathhouse-warehouse.

During reclamation, usable interior components will be salvaged and the building will be demolished and removed from the premises. Concrete floors and foundations will be broken up and used for coarse backfill material.

Parking Lot -- A 1.8 acre asphalt surfaced parking area is located near the office-bathhouse-warehouse for use by mine personnel. Approximately 75 designated parking spaces are provided. A 4 to 6 inch thick asphalt surface covers the parking area. Asphalt berms and steel guard rails line the outside edge of the lot.

Runoff from the parking areas is collected within the asphalt berms and directed through the surface drainage system to the sediment pond. The parking lot is cleared of snow and debris and resurfaced as needed.

Asphalt will be broken up and used for coarse backfill during reclamation.

Underground Shop -- An underground shop is presently under construction and near completion at Des-Bee-Dove Mine. It occupies approximately 1,100 sq. ft. just inside the portal opening. The shop entrance is concrete block including an 8' x 15' roll-up steel door. Interior is roof bolted and shot creted walls and ceiling with concrete floor.

The underground shop will be used for periodic maintenance and minor overhauls on small equipment such as tractors, scoops, and trailers.

Standard building maintenance procedures will be followed on the underground shop to ensure good housekeeping and order.

Reclamation for the shop will include salvaging of usable interior components, demolishing the entrance, and sealing and backfilling the portal.

Material Storage Areas -- Approximately 1 acre of the tibble fill structure is designated for material storage. Items stored in this area include new and used equipment and materials such as steel beams, sheet metal, conveyor belt, wood beams, timbers, and power cable. This material storage area is gravel surfaced.

All outside material storage areas are gravel surfaced.

South of the office-bathhouse-warehouse in the parking lot is a material storage shed. The shed is set on steel pipe stands about 3 feet off the ground. It is 150' long, 10' deep and 12' high with a gradually sloping roof. Shed construction is steel walls, roof, and shelving with concrete floors except for one small extension of the shed on the far south end which is wood with concrete floor set on the ground. Chain-link gates on the front of the shed provide the required security.

Items stored in the shed are materials and machine parts requiring limited security and cover.

Deseret storage area is located outside the Deseret portals and occupies space either side of the access road to Beehive portal. Materials stored here include crib blocks, timbers, concrete blocks, bagged rock dust, and roof bolts. A small area on the west side of Deseret portal area is utilized for storage of bulk rock dust in a 100 ton capacity rock dust silo.

Beehive and Little Dove storage area is just outside Beehive portal. Items stored here are the same as those stored outside Deseret portal.

Maintenance of the outside storage areas is limited to snow and debris removal and resurfacing as needed. The material storage shed will be painted as needed to maintain its outside appearance.

During reclamation, material storage areas will be cleared and reclaimed as outlined in Reclamation Plan. The material storage shed will be dismantled and removed from the premises.

Fuel Facilities and Oil Storage -- Five separate fuel facilities are utilized at Des-Bee-Dove Mine. They are identified as follows:

- 1) Lower Fuel Facility
- 2) Main Office Gas Pump
- 3) Deseret Fuel Facility
- 4) Beehive Fuel Facility
- 5) Water Tanker Fuel Facility

Lower, Deseret, and Beehive fuel facilities have oil storage sheds associated with them.

Lower fuel facility is located on the west side of the tipple yard on a small rock and soil embankment. Three diesel fuel tanks are in use with 1,000, 500, and 500 gallon capacities. Two of the tanks are set directly on the fill and one is on a metal stand. One oil storage shed is located next to this fuel facility.

All oil storage sheds are constructed identically. The underframes are constructed of steel pipe fashioned into skids for portability. The sheds are set approximately three feet off the ground on the steel pipe frames. Walls and roof are steel. A set of locking steel mesh sliding doors are set in the front of each shed for security.

Oil storage sheds generally contain hydraulic oils and require lubricants stored in five gallon cans.

The mine office gas pump is located on the southeast outside corner of the warehouse. The electric pump draws gasoline from a 2,000 gallon buried tank.

Deseret fuel facility includes one 1,000 gallon diesel fuel tank on a metal stand. An oil storage shed is located next to the Deseret fuel tank.

Beehive fuel facility consists of one 1,000 gallon buried diesel fuel tank accessed by an electric pump. Two oil storage sheds are located near this facility along the portal access road.

Due to the dry nature of the mine, water is trucked and pumped to the mine for use in coal dust suppression. A tank truck runs several times daily carrying water to a pumping facility which delivers to an in-mine sump. A 3,000 gallon diesel fuel tank is provided near the pump house for refueling of the water delivery truck.

All fuel facilities and oil storage sheds are clearly marked with signs identifying the flammable nature of their contents and warning against smoking. These facilities are placed to eliminate the chance of collision with mobile machinery.

In conjunction with reclamation, all fuel facilities will be removed and sold for scrap or salvaged.

Mine Ventilation Fans -- Four 150 Hp, axial flow fans are utilized to ventilate the Des-Bee-Dove Mines. They are as follows:

- 1) Deseret #1 Fan
- 2) Deseret #2 Fan
- 3) Beehive Fan
- 4) Little Dove Fan

Each fan is electric motor driven. Each fan ventilates by exhausting air from the mine through a portal opening with the exception of Beehive fan which draws exhaust air through a shallow shaft. All these fan installations are set on concrete foundations.

The fans are inspected daily and greased as needed. Mechanical maintenance procedures are followed to keep the fans operational at all times.

During reclamation, the fan installations will be dismantled and salvaged. The fan portals will be sealed. The Beehive ventilation shaft will be plugged and capped. Concrete foundations will be broken up and used for coarse backfill.

Power Supply and Main Substation -- Power is supplied to Des-Bee-Dove Mine from a 69 KV fed substation which transforms the utility service down to the utilization level of the mine and surface facilities. The utility service line runs to the main substation along the hillside east of the surface facilities.

The power supply system was installed and is maintained by Utah Power & Light Company - Southern Division.

At the end of mine life, the system will be removed by Utah Power & Light Company - Southern Division. Gravel and foundation material from the substation will be used for backfill.

Water Pollution Control Facilities

Drainage System -- Des-Bee-Dove drainage system is designed to adequately collect, pass, and control sediment from a 10 yr.-24 hr. precipitation event. No perennial streams are located in the Des-Bee-Dove drainage. System collection and control are illustrated in Map 3-4.

Runoff is collected from Des-Bee-Dove drainage "disturbed" and "undisturbed" areas and either passed to the sediment pond or collected in Beehive Mine sump. The sediment pond and drainages are designed to adequately handle all runoff from the Des-Bee-Dove drainage.

The drainage system consists of open ditches, bermed roadways, and culverts which collect runoff and divert it into an unnamed tributary of Grimes Wash and ultimately into the Des-Bee-Dove Sediment pond.

Because of the dry nature of the mine, water for in-mine coal dust suppression must be obtained from outside sources. Therefore, much of the water from the mine is collected and routed into Beehive Mine sump. Once in the mine, water is totally captive and is not discharged from the mine.

Maintenance on the drainage system consists of annual inspection and cleaning of ditches and culverts. Trash and debris are removed and necessary repairs are made to ensure smooth operation of the system.

During reclamation, a revised drainage system will be installed and made operational. Details are included in Reclamation Plan.

Mine Water -- Des-Bee-Dove Mine is a dry mine. There is no discharge from the mine. As previously stated, water must be obtained for use in the mine from outside sources. Sources include storm runoff collection, trucking and pumping, and pumping from adjacent mines.

In order to provide one source of water in the mine, a trucking and pumping system has been installed at Des-Bee-Dove Mine. A tanker truck collects and delivers irrigation water from the entrance to Danish Bench road (off State Highway 29) up to a 10,000 gallon buried water tank below the mine area. Water is pumped from the buried tank through a 4" line up to Deseret sump. Until recently, all mine water needs in excess of collected storm runoff were fulfilled by this system.

Storm runoff collection was previously described and is illustrated in Map 3-4.

A potentially stable source of mine water has recently been tapped through Deer Creek Fault from Deer Creek Mine into Little Dove sump. Deer Creek Mine discharges excess mine water daily (see Deer Creek Permit Application). To better utilize the excess mine water from Deer Creek Mine, a connection has been made through Deer Creek Fault to Little Dove Mine and water is being collected and used in parts of Des-Bee-Dove Mine. Potentially, this source could supply the needs of the entire mine.

Some of the water from Deseret sump is being utilized for dust suppression and washdown in the tippie.

The mine water system is maintained to ensure adequate supply to the mine and zero discharge from the mine. The trucking and pumping system will be maintained as a back-up for the in-mine source and runoff collection.

During reclamation, exterior pipelines, tanks, and pumping systems will be dismantled and removed from the premises. Further reclamation will be performed as outlined in Reclamation Plan.

Culinary Water System -- Presently, water is being transported from a local culinary water system by truck to Des-Bee-Dove Mine. Culinary water is stored in a 45,000 gallon storage tank behind the office-bathhouse-warehouse. Water is drawn, as needed from the storage tank for use in the office and bathhouse.

A system is being considered for installation to treat water from the Deseret sump for the needs of the mine facility. A water treatment system, if approved, will be installed to treat 10 gpm of water for storage and use in the existing culinary water system. The proposed system will be designed and installed with approval from the Utah State Department of Social Services.

System maintenance is performed as needed to promote smooth operation of the system and to ensure compliance with State culinary water standards.

During reclamation, the culinary water system will be dismantled and sold for salvage or scrapped.

Sewer Treatment System -- Sewage from the office and bathhouse is collected in a single 2,500 gallon septic tank located underground just south of the office-bathhouse-warehouse. Effluent from the septic tank is carried by a

6-inch diameter pipeline to an absorption field located in the tipple area fill structure. The sewer treatment provided fulfills State and local county health codes.

The sewer treatment system requires no maintenance.

For reclamation, the sewer line will be sealed and remain in place. The septic tank will be sealed off and abandoned. The absorption field will be left to dry out.

UNDERGROUND DEVELOPMENT WASTE DISPOSAL (784.19)

Plans for underground development waste rock disposal were submitted to OSM on December 31, 1980. Approval is pending. A copy of the disposal plan is included in the appendix.

TRANSPORTATION FACILITIES (784.24)

Des-Bee-Dove Mine operation utilizes roads and conveyors in association with facilities described in Operation Plan. All portal facilities are shown on drawings 3-3A and 3-3B. A description of the construction, use, maintenance, and removal of each transportation facility at Des-Bee-Dove Mine follows.

Roads

Des-Bee-Dove Mine operation utilizes two facility roads. They are identified as 1) Mine Access and Haul Road and 2) Portal Access Road.

Mine access and haul road is asphalt surface extending approximately 7 miles along Danish Bench between State Highway 29 and Des-Bee-Dove mine office. Road width averages 20'. Road gradient is approximately 5% overall to the mine gate and approximately 8% overall from the mine gate to the mine office. Surfacing is 4" thick on standard gravel road base, crowned in the center and gently sloping to the sides. Roadways cut in steep embankments are bermed and guard railed in critical locations for safety and runoff control.

The mine access and haul road is used daily by mine personnel for access to the mine facilities. The road is also used for coal haulage by semi-trailer trucks. Twice yearly the road is utilized for cattle drives to and from East Mountain grazing areas.

Emery County Road Department is responsible for maintenance of the roadway from State Highway 29 to the mine gate. The remainder of this roadway is maintained by Emery Mining Corporation. The road is officially designated as a county road from State Highway 29 to the property boundary. Road maintenance consists of snow removal, periodic resurfacing, and cleaning of drainage ditches.

Portal access road is approximately 2,500' long winding from the mine offices past Deseret portal and ending near Beehive portal. Plans and selected cross-sections are included in Map 3-5. The portal access road construction consists of compacted soil and gravel surface. Road width averages 20'. Because of the steep terrain in the portal area, large soil berms or steel guard rails have been constructed to promote safety.

Portal access road gradient averages about 10% overall, due again to the steep natural terrain which allows no leeway for more gradual gradients without further extensive construction. On July 15, 1978, sufficient evidence was provided to OSM and the Division to make a determination whether a gradient variance should be granted. Correspondence regarding a determination seemed to concur with UP&L's findings that "major construction of complying roadways would increase environmental degradation". A determination of UP&L's submittal is still pending.

Portal access road is used daily for access by mine labor and service personnel. Like the mine access road, the portal access road is utilized twice yearly for cattle drives to and from East Mountain grazing area.

Maintenance on the portal access road includes periodic resurfacing, snow removal, and drainage inspection and cleaning as needed.

Details of road removal are included in Reclamation Plan.

Conveyors

Seven individual conveyors or sets of conveyors are utilized in the Des-Bee-Dove coal handling and sizing process outside the mine. They are identified as follows:

- 1) Little Dove Conveyor
- 2) Transfer Reclaim Conveyor
- 3) Deseret Conveyor
- 4) Main Stockpile Feed Conveyor
- 5) Auxiliary Stockpile Feed Conveyor
- 6) Tipple Feed Conveyor
- 7) Tipple Process Conveyors

All conveyors from portal to stockpile are 42" wide and are idler-supported with the exception of the Main Stockpile Feed Conveyor, which is wire rope-supported. Steel frames for the conveyor supports are anchored to concrete foundations.

Little Dove Conveyor is in two sections 100' and 150' in length broken by a transfer structure. The 100' covered section carries coal from the portal to the transfer structure. The 150' covered inclined conveyor receives coal from the transfer structure and delivers to the stacking tube transfer.

Transfer reclaim conveyor is 100' long and collects coal from the base of the stacking tube transfer and delivers to the Deseret transfer.

Deseret Conveyor delivers run-of-mine coal production from Deseret and Beehive mine operating sections to Deseret transfer. An in-mine coal transfer delivers coal from Beehive Mine to Deseret Mine.

Main and Auxiliary Stockpile Feed Conveyors deliver coal to the run-of-mine stockpile area.

Tipple Feed Conveyor is 36" wide and delivers coal from the run-of-mine coal stockpile to the tipple for screening, crushing, separating, and loading.

Tipple Process Conveyors are incorporated in the tipple operation. Size details and tipple process association for these conveyors are illustrated in Figure 7 in Operation Plan.

Standard mechanical maintenance procedures are followed to ensure smooth operation and long life of the facility conveyors.

During reclamation, the conveyors will be dismantled and sold for salvage. Concrete foundations will be broken out and used for coarse backfill.

OFFSITE SUPPORT FACILITIES (785.21)

All facilities supporting Des-Bee-Dove Mine operation are located within the permit boundaries. Construction, use, maintenance, and removal of each facility are discussed in Operation Plan.

BLASTING PLAN

Storage locations for blasting agent and primers are shown on Facility Maps 3-3A and 3-3B. A Blasting Plan is included in the appendix.

IN-SITU PROCESSING (785.22)

There are no in-situ processing activities or plans for such activities associated with Des-Bee-Dove Mine.

DIVERSIONS (784.22)

Des-Bee-Dove Mine operation will not require further runoff diversion in the permit area until reclamation.

Specific procedures for diversion during reclamation are described in Reclamation Plan. Existing runoff diversions are described in Operation Plan.

EXPERIMENTAL PRACTICES (786.13)

No experimental underground mine practices are being conducted at Des-Bee-Dove Mine.

RETURN OF COAL PROCESSING WASTES TO UNDERGROUND (784.25)

No plans exist to return coal processing wastes to the underground at Des-Bee-Dove Mine.

AIR POLLUTION CONTROL PLAN (784.26)

In accordance with UMC 817.95, air pollution control measures have been applied and will be applied throughout the life and subsequent reclamation of the Des-Bee-Dove Mine.

The main service road and parking lots are asphalt surfaced. Service roads to the mine portals are gravel surfaced. Vehicular traffic on these roads is controlled to minimize contribution of fugitive dust. Service roads are used daily at low speeds for access by service and labor personnel.

The steep natural terrain restricts unauthorized travel on other than established roads and limits vehicle speeds on roadways that are established.

All areas adjacent to roads or travelways have been planted for revegetation. Reseeding is repeated until vegetation is adequately established. Revegetation is applied on all disturbed surfaces and regraded areas as soon as season and weather permit.

Fugitive dust control procedures are implemented in the coal handling process. Little Dove run-of-mine belt conveyor is covered. Belt scrapers are installed on most conveyors to reduce coal dust generation. Coal sizing and handling from stockpile to truck are completely enclosed in the Des-Bee-Dove tipple. A vacuum system in the tipple helps reduce coal dust generation during crushing and screening

plus assists in tipple housekeeping. Transfer points in the tipple are enclosed, rubber curtained at inlets and outlets, and are equipped with dust collection hoods.

The high moisture content of the coal at Des-Bee-Dove Mine provides dust control throughout the coal handling process. Analysis of samples taken during processing show an average 8.4% inherent and surface moisture content in 775 samples. Table 8 is a copy of the sample analysis data. Coal dust generation is reduced throughout the handling process by the dampening effect of this moisture.

The captive nature of the Des-Bee-Dove Mine product nearly eliminates the possibility of spontaneous combustion conditions developing. Long term stockpiling within the permit area is unlikely. Maximum stockpile duration is approximately one month. Care is taken to ensure that short term stockpiles are completely cleared away prior to restockpiling.

TABLE 8

STANDARD LABORATORIES INC.
UTAH POWER & LIGHT CO.

DATE 1/ 2/81

LOCATION NUMBER 1103		LOCATION DESCRIPTION DESERET, BEEHIVE, LITTLE DOVE BELT		NO. OF SAMPLES	MEAN	ST. DEV.	MINIMUM	MAXIMUM
<u>LONG PROXIMATE (AS RECEIVED)</u>								
%MOISTURE	TIME PERIOD			10	7.10	0.65	5.82	7.91
	12/15/80-12/20/80			43	7.33	0.99	5.99	8.64
	MONTH ENDING 12/20/80	12/20/80		775	8.45	1.53	4.94	25.05
%ASH	12/15/80-12/20/80			10	9.03	0.40	8.14	9.47
	MONTH ENDING 12/20/80	12/20/80		43	8.93	1.18	6.74	12.46
	YEAR ENDING 12/20/80	12/20/80		775	10.57	2.23	5.91	22.29
%VOL. MATTER	12/15/80-12/20/80			10	42.02	0.49	41.00	42.76
	MONTH ENDING 12/20/80	12/20/80		43	42.17	0.72	40.09	43.79
	YEAR ENDING 12/20/80	12/20/80		775	40.09	1.25	33.03	43.79
%FIX. CARBON	12/15/80-12/20/80			10	41.86	0.49	40.83	42.52
	MONTH ENDING 12/20/80	12/20/80		43	41.53	0.83	39.81	44.84
	YEAR ENDING 12/20/80	12/20/80		775	40.89	1.58	32.98	45.96
BTU/LB	12/15/80-12/20/80			10	12194.09	122.16	12060.00	12403.00
	MONTH ENDING 12/20/80	12/20/80		43	12147.48	245.20	11305.00	12593.00
	YEAR ENDING 12/20/80	12/20/80		775	11700.03	404.84	9360.00	12593.00
%SULFUR	12/15/80-12/20/80			10	0.54	0.03	0.48	0.58
	MONTH ENDING 12/20/80	12/20/80		43	0.54	0.04	0.48	0.64
	YEAR ENDING 12/20/80	12/20/80		775	0.59	0.07	0.40	1.04
% AIR DRY MOIS. LOSS	12/15/80-12/20/80			0	0.0	0.0	0.0	0.0
	MONTH ENDING 12/20/80	12/20/80		0	0.0	0.0	0.0	0.0
	YEAR ENDING 12/20/80	12/20/80		0	0.0	0.0	0.0	0.0

OPERATION PLAN EXISTING STRUCTURES (784.12)

Under the definition of Existing Structures, as found in Environmental Statement for the Surface Mining Control and Reclamation Act of 1977, is as follows:

Existing Structures

The types of structures which may be affected by the regulations in the preferred alternative concerning existing structures are roads and associated structures, fills, berms, benches, waste banks, discharge structures, diversions, rail loops, rail sidings, rail spurs, refuse areas, shafts, spoil pipes, utility lines, terraces, drains, wells, exploration holes, boreholes, barricades, fences, bridges, culverts, storage areas, mine buildings, tipples, storage or repair facilities, surge ponds, processing plants, slurry pipelines, conveyors, and other man-made structures or areas disturbed by mining.

"Existing Structures" by definition, as interpreted by applicant, means everything constructed by man for mining purposes.

To apply the stated provision of UMC 784.12 to all entities becomes somewhat confusing especially when addressing structural components such as buildings, warehouses, tipples and processing plants.

Monitoring and evidence of how such facilities meet Subchapter "K" seems irrelevant in that the performance standard has no specification to gauge structural worthiness. Unless Subchapter "K" regulates not the building itself but rather the earthen structure upon which such building is situated (explanation by Hardaway).

Nevertheless, to complete the requirements of this subchapter, applicant chooses to identify all Existing Structures and shall describe the structure (earthen) on which such facility rests.

For the sake of organization and simplicity, we have decided to list the various structures by groupings of associated structures. Group I (Hydrological Association). This group association will list those facilities such as underground diversions, surface drainage systems and sedimentation ponds. Group II shall list and incorporate all surface facilities, building, conveyors, power lines, storage tanks, etc., and all facilities related with operations as they pertain to coal processing. Group III lists only earthen structures, i.e., fills, embankments, roads and earthen berms.

GROUP I (Hydrological)

Surface Drainage

With the exception of the parking lot and bathhouse/warehouse/office facilities, the Des-Bee-Dove Mines are located within a narrow, steep, dry wash and are connected by a single access road (see surface drainage Map 3-4).

Storm runoff water has been diverted from its normal channel to the access road which is bermed and ditched. The upper mines, Beehive and Little Dove, are graded to capture surface runoff from its portal area and portions of the access road that leads to East Mountain. This water is collected and stored in an underground sump for mining purposes.

For information pertaining to surface water entering an underground mine UMC 817.55, see separate discussion following.

Bermed and ditched, the access road provides the only water course for storm runoff waters between the two mines, Beehive and Deseret. Bathhouse and parking lot are graded and ditched to direct runoff waters to a natural drainage away from the main wash drainage.

At the upper section of the loadout area (large fill) where the access begins, the grade reduces to $4\frac{1}{2}\%$ and drainage is accommodated by a separate ditch that directs the water to a 36" culvert near the fill face. There are no drop drains or subsurface collection system associated with this mining

facility. Arid conditions and the mine's limited life (11 years) outweigh the justification of an underground system.

Hydrological assumptions and calculations are included in the final reclamation section (see 10-year, 24-hour event). Peak flows of 173 cfs are anticipated to swell beyond the access road ditch capacity, thus the access road itself will serve as a channel for brief periods of 10 or 15 minutes during heavy precipitation.

Historically, the mine area has controlled surface runoff for forty years and, with the addition of the sediment pond, no surface water is expected to pass the system's capacity of a 10-year, 24-hour storm event.

Sedimentation Pond

Because of limited space and the precipitous land forms surrounding the Des-Bee-Dove Mines complex, the sedimentation pond was located off the permit area and placed at the mouth of the dry wash that drains the mine site.

Approved and constructed in late 1979, the 19.4 acre foot pond was sized to accommodate a 10-year, 24-hour storm event from not only the disturbed mine area but also the head of hollow drainage above the mine site. It was reasoned that the increased pond size was less environmentally harmful than diversion facilities necessary to divert the head of hollow drainage waters above the mine area.

Pond design criteria, geotechnical information, and hydrological computations are included in the appendix.

Capacity and dam height are less than the stated minimums of 30 CFR 77.216(a); therefore, are exempt from 30 CFR 77.216-1 and 30 CFR 77.216-2.

Location of the pond is sited on State of Utah land under Utah Land Lease #436 (reference, drainage Map 3-4).

The Des-Bee-Dove's sedimentation pond has been issued an N.P.D.E.S. discharge permit whose identification number is UT-0023591. Only one outfall is associated with the permit.

Structure is monitored quarterly and an annual report of its condition shall be submitted to the regulatory authority. Relevant construction maps are included in the Appendix.

Approval of the sedimentation pond by appropriate state and federal agencies has been given. Company states the sedimentation pond meets the performance standards of Subchapter "K" and requires no modification.

GROUP II (Surface Facilities and Structures)

To aid the reviewer in understanding how the mines are interrelated, refer to Maps 3-3A and 3-3B.

Des-Bee-Dove is an abbreviation for Deseret, Beehive and Little Dove Mines. Two mines, Beehive and Little Dove Mine, the upper seam (Blind Canyon), and the Deseret Mine

is located in the lower seam (Hiawatha). Separated vertically by 140 feet, the portal facilities are literally one upon the other.

Individual photographs of each major surface facility, showing its current condition and its structure, are included in the Appendix.

Mine development over the past forty years has seen a constant change of surface facilities. Tipple, loadout, and conveyors have undergone changes from modification to complete rebuilding. Specific dates of construction and completion are not possible in all cases and shall be noted as such.

Utah Power & Light Company purchased these mines in 1972. Since that time major reconstruction of the certain facilities has taken place, most notably, the bathhouse, parking lot, and their structures.

The following list includes the major surface facilities located at the Des-Bee-Dove Mines, their approximate date of construction, mine association and other relevant information.

DES-BEE-DOVE MINE FACILITIES

<u>Facility</u>	<u>Photo</u>	<u>Approx. Construction* Date</u>
Office-Bathhouse-Warehouse	Included	Mid-1972
Material Storage Shed		Early 1978
Underground Shop	Included	Early 1981
Tipple	Included	1952-1978
Beehive Trash Bin		Aug. 1980
Deseret Trash Bin	Included	Aug. 1980
Culinary Water Storage Tank		1972
Pump House and Mine Water Storage System		1972
Parking Lot	Included	Mid-1977
Main Substation	Included	1975
Deseret Fan #1	Included	1977
Deseret Fan #2	Included	1972
Beehive Fan	Included	1972
Little Dove Fan	Included	1976
Conveyors -		
Little Dove	Included	1977-78
Deseret		1975
Transfer Reclaim		1975
Main Stockpile Feed		1975
Aux. Stockpile Feed		1975
Coal Surge Stockpile	Included	1952
Material Storage Areas	Included	Varied
Fuel Facilities & Oil Storage	Included	Jul. 1980
Rock Dust Tank		1978

* Note: Many construction dates are based on the most recent facility modification.

Excepting the two large structures that support the bathhouse and loadout facilities, most surface structures are located on three small platforms cut on sandstone ledges located astride the drainage, or wash, and will be further discussed in Group III of this chapter.

Plans and drawings for each structure are on file in Company's office at 41 North Redwood Road, Salt Lake City, Utah, for review by the regulatory authority.

Company states each facility used for handling, processing and transporting coal has been designed by a registered professional engineer. Also, the bathhouse/shop/warehouse building was engineered to meet acceptable state and federal building codes. Facilities meet applicable regulations of Subchapter "K" and require no modifications.

Discharge of Water into an Underground Mine (817.55)

As the mines are virtually dry, water for drinking and mining must be hauled to the mine site.

It is expedient to capture surface runoff water when possible. All captive water is stored underground where sedimentation and filtration occurs prior to its use in the mining machinery. No water is discharged to the surface at any time.

Applicant is installing an alternate underground water supply from the Wilberg Mine workings and expects to have it completed by June, 1981.

Water quality meets provisions of section 817.42 and does not disrupt the hydrological balance of the underground water regime as no water exists. Company requests the regulatory authority to grant this variance as provided in UMC 817.55.

GROUP III (Earthen Structures)

The mining complex consists of five (5) major earthen structures (refer to Map 3-6). They are: (1) the underground development waste structure (tipple, coal storage pile and storage yard); (2) bathhouse/warehouse/office building, parking lot structure; (3) Deseret portal area; (4) upper coal storage area structure; (5) Beehive and Little Dove portal area.

Structure No. 1 (Loadout and Material Storage Area)

Of the five sites, the loadout area is largest with 4.1 acres of working space. This structure is the result of forty years of development. Waste rock, boney coal and coal fines which, at that time, had no commercial value, were systematically disposed of by end-dumping over a spoil pile resulting in what is now the loadout, coal storage and material storage areas.

Volume calculations show approximately 200,000 cubic yards make up this structure which is located in a small wash drainage within the permit area. Structure will be unaffected

by subsidence as the fill is situated below the elevations of both coal seams.

Methods used to construct this fill do not necessarily meet stated design standards of section 817.81 of the regulations but under 30 CFR 701.11(d) said structure qualifies as a pre-existing structure with exemption from design requirements if structure can demonstrate compliance with the performance standards of Subchapter "K".

Applicant requests from the regulatory authority approval of the structure based on the following compliance information.

Stability analyses performed indicates the structure approaches the required static factor of safety (Rollins) (see Appendix). Limiting factor is the face outslope which measures 1.6h:1v. Rollins recommends an outslope of 1.7h:1v to meet the 1.5 safety factor. To achieve this slope approximately 10 feet additional slope length is required. At this writing, slope-face stability is still being investigated.

As company plans to leave the fill in place in the final reclamation plans and based on the fact that the structure was constructed without a subdrain system, the following geological report is submitted as a demonstration that the area is void of springs and seeps and request a variance to UMC 817.83 as published in the Federal Register/Volume 45 No. 226, page 76932, November 20, 1980.

Area Geology

The Des-Bee-Dove waste dump area is located in a dry wash which has been naturally eroded into the bedrock. The walls of this wash are steep near its bottom and slope upward to rock ledges and cliffs which surround the mine waste dump area. The rock walls which form the abutments for the waste dump consist of alternating zones of sandstone, siltstone and mudstone along the contact of the Starpoint Sandstone and Masuk Shale. The floor of the wash consists of thinly bedded mudstone. All of these rocks form a competent foundation for the waste dump material.

Although no hydrologic mapping was made of the wash prior to its filling with waste rock, the available data overwhelmingly supports the conclusion that ground water does not flow from the bedrock into the mine waste area. The outcrop escarpment at the stratigraphic horizon of the waste dump (Starpoint-Masuk contact) has been hydrologically mapped for miles on each side of the waste dump and no springs have been located or associated with this horizon. The waste dump and Des-Bee-Dove Mines are located in an area void of ground water, primarily because of existing faults and escarpments that circumvent the area isolating it from the ground water flow present throughout other areas of East Mountain. The mining in the Des-Bee-Dove Mines has yet to

intersect any ground water. Geologically, the rock formations in the area of the waste dump dip in a northwest direction into the mountain. Any water which might flow into the strata would flow down the dip away from the fill structure.

From a geologic and hydrologic standpoint, the area of the Deseret waste dump is stable. The rock outcrops in the wash form competent abutments for the waste dump.

Test borings have shown the structure is largely composed of coal waste and covered with a 10-foot mantle of subsoil material excavated from the parking lot structure. This covering seals the coal from surface water and possible spontaneous combustion. Covering material was analyzed for acceptance as a plant growth medium (see soils section) and found acceptable.

Surface water is presently directed away from the slope face and directed through a 36" culvert to intersect the natural drainage channel below the fill structure.

Chemical analyses of the overburden and coal indicates only trace amounts of iron and sulfur. Present covering meets UMC 817.103 (covering coal and acid and toxic forming materials).

As no ground water exists and surface waters are protected from penetrating the coal core, company states no pollution of water occurs. During operations, sedimentation shall be collected and controlled by an existing sedimentation

pond located down drainage from this structure.

Taking into account present knowledge of the physical nature of the structure, land form morphology, hydrological characteristics and forty years of on-site climatological history, company requests the regulatory authority to approve this structure as meeting the regulations with stated exemption and demonstrated provisions of meeting the performance standards of Subchapter "K".

Monitoring has been in the form of visual inspections throughout the years and no reports were written.

Structure No. 2 (Bathhouse and Parking Lot)

Constructed in 1972, this structure is not a balanced cut and fill section. Excess material was hauled to the spoil fill (site 1) and was used as a covering. Measuring 350 by 190 feet and with the parking lot which measures 400 by 65 feet combined, provides working space of 2.1 acres.

This platform (structure) was constructed using acceptable earth work design practices, i.e., fill portion was built in wetted layer and compacted with a mechanical compactor. Company plans to reconstruct this structure on final reclamation. Stability meets stated factor of safety in UMC 817.101. A stability analysis is provided in the Appendix (Rollins).

No monitoring is planned for this structure. No ground water affects the fill itself (see Geological Report Structure No. 1) and surface waters are drained by ditching.

No modification is planned as structure meets performance standards of Subchapter "K".

Structure No. 3 (Deseret Portal)

A strip of level ground, whose base is the basal member of the Hiawatha Coal Seam, which is a massive sandstone outcrop formed by weathering of the dry wash. A 170 by 250 feet landing serves as the Deseret portal area which supports the mining facilities such as access road, shop area, fan portal installation, power substation and some material storage.

Structure No. 4 (Coal Storage and Surge Pile)

A small, natural semi-circle sits on bedrock formed by the dry wash channel measures approximately 180 feet. A spur road serves as its only access.

Structure No. 5 (Beehive and Little Dove Mine Portals)

This flat pad sits approximately 140 feet vertically above the Deseret Mine. Both mines (Beehive and Little Dove) are level entry mines located at the coal outcrop (Blind Canyon Seam).

Constructed from stripped materials along the coal seam and anchored with down-sloped bin walls, this area measures 400 feet long by 140 feet wide. Drainage is gravity flow into the Deseret Mine portal where water is

stored in an underground sump. Structure is located on sandstone outcrops again weathered by the drainage within the dry wash.

Structures 3, 4 and 5 are all small disturbances interconnected by one access road that serves as their drainage (except Deseret portal).

Stability is unquestionable in that all are located on solid sandstone foundations. The upper area (Structure No. 5) is susceptible to subsidence only after final mining and pillar removal from the lower seam. It is proposed to leave sufficient entry barriers and pillars within the Deseret portals to support the reclamation work of the Beehive and Little Dove portal areas.

No monitoring is proposed for these three structures. No modification is planned for the three active sites as company states they meet the performance standards of Subchapter "K".

ROADS - HAUL ROAD, ACCESS ROAD AND MOUNTAIN ACCESS (CATTLE DRIVE)

Haul Road

As previously described in the Existing Structures introduction "roads" are considered existing structures (SMERA-EIS).

The haul road is an extension of a county road which is maintained by the county to the permit boundary

line. Provision for mining within 100 feet of a public road is given by definition of UMC 761.5 and UMC 761.114(i). As the road was evolved over years of upgrading no engineering maps or cross-sections are available. Company submits instead a 100'=1" topography map (3-3B).

Company, as directed by the Division of Oil, Gas and Mining, submitted information at public hearings held in Salt Lake City about August 1978, concerning roads associated with this mining complex. As of yet, no determination has been made as to the variance requested. Company, therefore, states the roads, all, are pre-existing with existing valid rights and are exempt from design standards as stated under UMC 700.11(e)i if company can demonstrate they meet performance standards of Subchapter "K".

Stability analyses were not conducted on road beds, cut slopes or embankments as stability has been proven by time and use.

Hydrological balance for the road includes hard surfacing, berms and ditching to accommodate a 10-year, 24-hour storm event. No streams are crossed and road pitch does not exceed the stated maximums of UMC 817.152.

Embankments and shoulders were seeded during the Fall of 1979 and is planned for reseeding in 1981.

The mine area is in excess of five (5) miles from any live or perennial stream, fishery or fee property owner. Adjacent ownership is controlled by both the Bureau of Land Management and the U. S. Forest Service who reviewed this operation under 30 CFR 211.

Mine Access Road

A short, steep, winding and unpaved road that runs from the tipple area up a bulldozed grade to the warehouse building exist, then switches to run upward along a blasted grade, past Coal Storage Pile No. 1 to the Deseret portal area where it crosses the drainage to traverse southerly along the outcrop of the Hiawatha seam for 650 feet to another switch back. The base of the coal seam forms the road bed against the near-vertical bluffs. Above the switch back, the road follows a grade partially against a natural cliff and partly against a blasted bank. At 650 feet on this tangent, it intersects the access road to the top of the mountain. The Little Dove-Behive portal area begins 150 feet beyond this intersection.

Hydrological protection of the road is described in the surface drainage section. Actually, the road serves as the major drainage channel during peak flows from a 10-year storm event. All sediment carried from this road is recovered in the sedimentation pond located down drainage from the mine site.

Road beds, cut slopes and embankments are proven stable after two decades of use. Road covering consists of crushed rock.

Reseeding for temporary vegetation was started in the Fall of 1979 and will continue through this year.

Company states that soil siltation and water quality and quantity have been protected by use of a sedimentation pond, temporary revegetation, limited use and speeds afforded to this road.

East Mountain Access Road and Cattle Drive

Constructed in 1971, this steep, dirt, four-wheel drive access road provides the only other access to the East Mountain plateau besides the Cox dugout road located in Cottonwood Canyon which normally remains snow-bound until mid-June or later.

Access via the mine road permits limited access to the eastern region of East Mountain where Utah Power & Light Company owns 920 acres of fee land. Need of this road goes beyond the life of the Des-Bee-Dove Mines. This two-mile long road also provides the only year-around access to a recently installed remote weather station located between the Des-Bee-Dove and Wilberg Mines. Other uses include twice a year cattle drive for cattle ranging on the east face of the plateau.

Though steep and narrow, it is applicant's intent to maintain this road in its present condition for access to its properties until such time that mining of the Deer Creek and Wilberg Mines is completed or such properties are disposed of. Barriers have been installed to prevent inadvertent use by the general public. Road maintenance is planned yearly.

Company contends that this access road is exempt from the regulations based on usage and purpose which is unrelated to mining.



FINAL RECLAMATION PLANS:
EARTH STRUCTURES AND DRAINAGES
FOR DES-BEE-DOVE, DEER CREEK
AND WILBERG MINES, UTAH

Prepared for

UTAH POWER & LIGHT COMPANY
Mining and Exploration
1407 West North Temple Street
Salt Lake City, Utah 84110

February 10, 1981

TEXAS INSTRUMENTS INCORPORATED
Western Region
2460 West 26th Avenue
Diamond Hill, Suite 46C
Denver, Colorado 80211

FINAL RECLAMATION PLAN (UMC 784.13

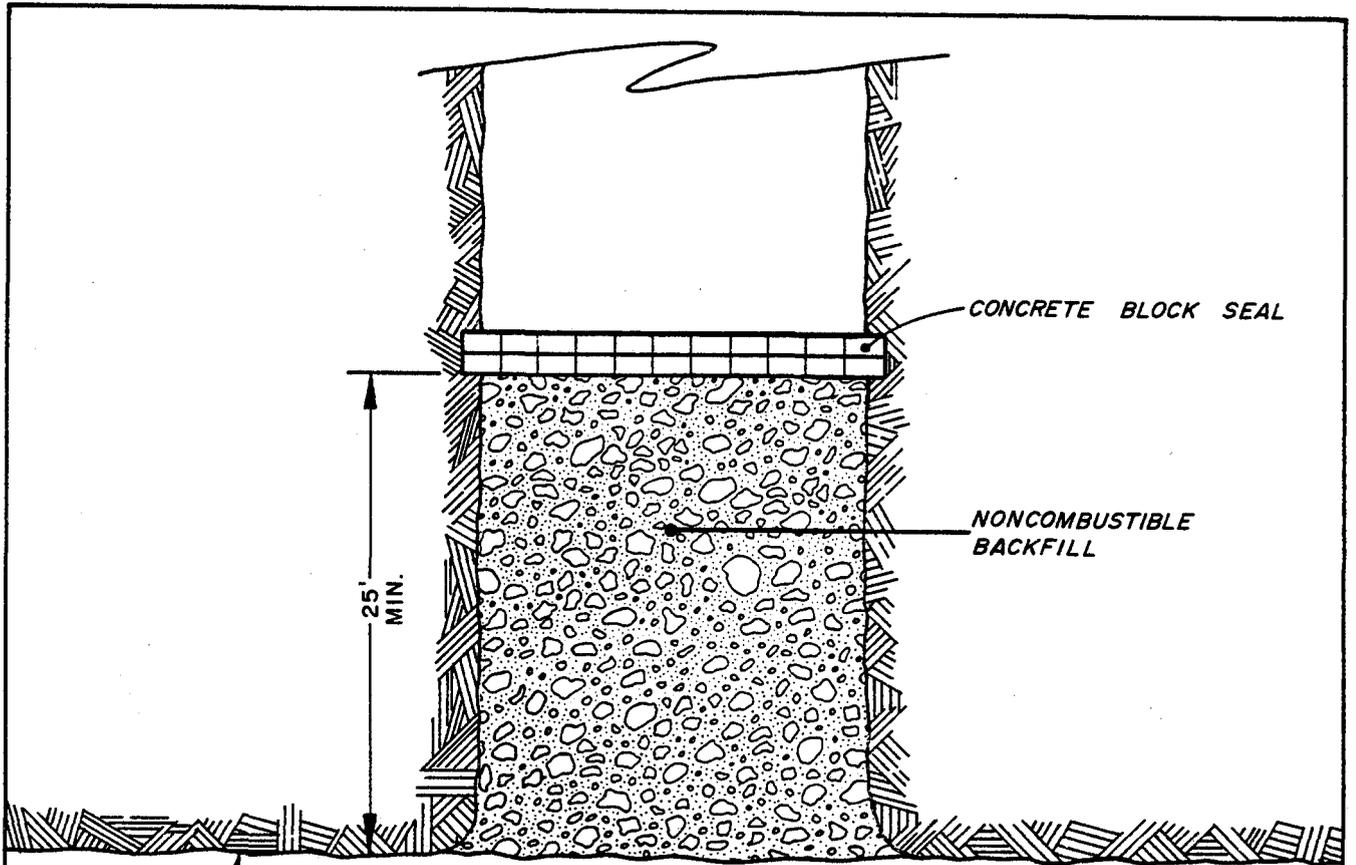
The overview of planned reclamation for this mining complex includes:

1. Removal of all surface facilities.
2. Seal all entries and surface shafts.
3. Remove and bury all asphalt and concrete pads and footings.
4. Clean areas where coal storage piles were used.
5. Stabilize existing road system.
6. To remove, backfill and grade the bathhouse structure.
7. Open old channel drainage through structures 3,4, and 5.
8. Eliminate highwalls at the portals structures 4 and 5.
9. Reconstruct drainage channel across structure 1.
10. Revegetate mine area.

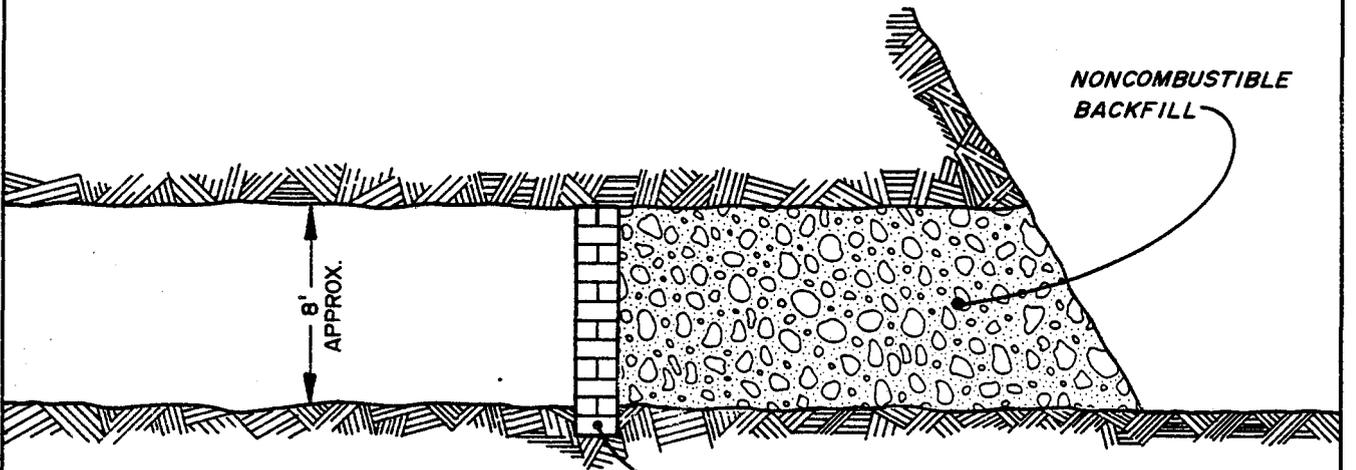
Portal Sealing

Final mining (pillar extraction) schedules show the Beehive and Little Dove Mines as completed first (upper seam). Sufficient pillars and barriers will be left near portal entrances to insure stability from possible subsidence at the portal faces.

As the coal dips downward from the entrances in mine, water of which now exists, cannot gravitate outward. No hydraulic seals are necessary.



PLAN VIEW



ELEVATION VIEW

FIGURE 1

**DES-BEE-DOVE
COAL MINES**

EMERY COUNTY, UTAH

TYPICAL PORTAL SEAL

UTAH POWER &
LIGHT COMPANY

SCALE:
NONE

DATE:
SEPTEMBER 2, 1980

DWG. NO.:
CM-10319-WB

All entrances and shafts shall be sealed as shown on Figure 1. There are 17 entries and 1 vertical shaft to be sealed. Two of the entries are breakout air shafts with prohibitive stipulations for outside disturbances. They shall be sealed from the inside.

Surface Facilities Removal

Upon completion of mining, surface facilities shall be removed as their need is no longer required.

Costs of removal are shown in the reclamation cost breakdown following.

Backfilling, Compacting and Grading

The restored drainage will conform closely to the original contour and channel except for a slight shift to the east on the Little Dove-Beehive portal area and passage through a riprapped channel construction (Map 4-1) over the storage yard-Coal Waste Embankment area. With the exception of the Coal Waste Embankment area, the entire channel will be on bedrock, therefore, control of the direction of flow is more important than velocity control. Two channel crossings will be required. Since bridges or culverts are not desirable as part of the post-mining land use, both crossings will be constructed as fords; the upper one will be over bedrock.

The riprapped channel over the Coal Waste Embankment has been designed to carry the peak flow calculated for the Des-Bee-Dove watershed. Watershed characteristics are depicted in Table I-1,

Table I-1. Watershed Characteristics, Des-Bee-Dove Mine.

Watershed	Area (acres)	Curve Number	Slope (%)	Drainage Density (ft/acre)	100 Year - 24 Hour Storm					
					Precipitation* (inches)	Q (in.)	Tp (min.)	Qp (cfs)	Peak Flow (cfs)	Total Flow (acre-ft)
Des-Bee-Dove	110	95	50	11.8	2.50	0.624	10.8	288	288	6
Des-Bee-Dove	110	95	50	11.8	1.80	0.371	10.7	173	173	3.5

10 YEAR - 24 HOUR STORM

*Storm event precipitation values calculated from NOAA, 1973.

the curve number derivation is shown in Table I-2, and height,

Table I-2. Curve Number Derivations, Des-Bee-Dove Mine.

Drainage	CN	Description*	Hydrologic Class
Des-Bee-Dove III	95	Excessively steep slope, S-Aspect with 20% cover	D

* Vegetation type and cover estimates based on Personal Communication, 1980 and on-site observation.

flow, and velocity are summarized for various channel slopes in Table 1-3. Hydrological procedures and calculations are depicted in the Appendix.

Table I-3. Height, Flow and Velocity for Various Channel Slopes, Des-Bee-Dove Mine.

Drainage	Channel Slope*									Peak Flow (cfs)
	5 Percent			10 Percent			15 Percent			
	Height (ft)	Flow (cfs)	Velocity (ft/sec)	Height (ft)	Flow (cfs)	Velocity (ft/sec)	Height (ft)	Flow (cfs)	Velocity (ft/sec)	
Des-Bee-Dove (III)	2.84	289	9.5	2.40	290	12.3	2.17	290	14.3	288

*Channel base width is 5 feet.

The channel will be constructed with riprap to a base width of approximately 5 feet, have a trapezoidal shape with sides constructed to a 1v:2h slope (Figure 2). Mannings equation was applied in determining flows and in all cases, Mannings roughness coefficient was 0.05. Riprap material sufficient to line the sides and bottom of the channel is present on the mine site.

Typical cross-section view of a trapezoidal channel
(not to scale)

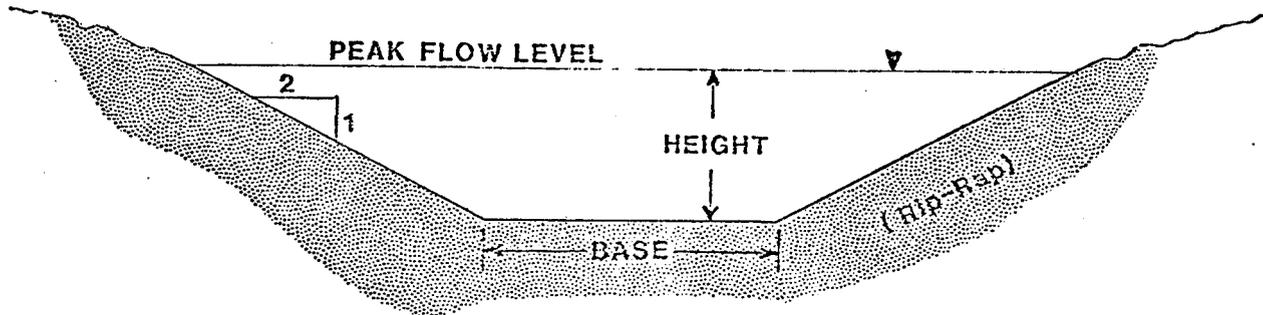


Figure 2.

Little Dove - Beehive Area

The Beehive mine portals are in a vertical sandstone cliff across the drainage channel. Other drainage to this dump area is tributary for only a few hundred yards up a uniform slope above the Little Dove portals. The grade of the mine dump slopes toward the portals at 2-3%. To cover the outcrop of coal and reinforce the portal seals, earth fill material from the shoulder of the dump will be placed on a 1v-2h slope to 15 feet in height against the cut bank. The toe of this fill will be graded downward to the east beginning at the Little Dove fan and running to a point north of the present road entrance where the grade will join drainage coming from the Beehive portals. No fill will be placed over the Beehive portal directly in the path of flow from the cliff. Drainage will flow along the fill and outboard movement will be contained by a 4-foot high berm.

The combined drainage will be turned down the access road to a point opposite the present stacking tube where an erosional cleft in the Desert cliff furnishes a natural rock drain. A 6-foot high berm across the road will be required to create the necessary diversion.

Fill distributed for the shoulder of the dump will not be adequate to completely cover the existing highwall as the topographic gradient is about 1:1. Additional fill may be obtained from dozing the bank on the outside of the Beehive face pad. Restoration to original contour at the highwall

will not be done as the slope above the highwall contains alternating steps of sandstone outcrop that will resist erosion more effectively than replaced fill which would have to be at the angle of repose in order to control drainage. Since natural vertical outcrops are proximate to this highwall, visual impact to an observer will be minimal.

All construction work in this area will be handled by dozer except that a backhoe may be employed to pull material up from the edge of the fill.

Deseret Portal Area

Reclamation of this area will consist of sealing the portals, coal clean-up, topsoiling outside the access road and construction of a 6-foot high berm to divert runoff from the road and direct it against the east side of the area. The berm will be constructed to permit vehicle passage. Drainage below the dump to the tipple area will be over natural bedrock (original channel) at a grade of about 25%. Runoff directed to the east slope will remain along it without containment until reaching the Coal Waste Embankment structure (tipple area). All construction will be by dozer. The access road will be left in condition suitable for stockdrives and access to the top of East Mountain.

The revision to 30 CFR 816.83(a)/817.83(a) - Subdrainage System for Coal Processing Waste Banks (Federal Register, 1980) provides for exemption from the subdrainage requirement where the operator demonstrates to the regulatory

authority that a subdrainage system is not required to insure structural integrity of the waste pile and water quality.

Test borings have shown that the Coal Waste Embankment is largely composed of coal waste covered with a 10-foot thick mantle of subsoil and overburden material. Chemical and soil analyses are included in the permit application.

Taking into account present knowledge of the physical nature of the structure, land form morphology, hydrological characteristics and forty years of on-site climatological history, the reclamation procedure best suited under these circumstances is to leave this structure in its present stable state. Hydrological controls will be installed to maintain water quality and the surface will be revegetated.

The Des-Bee-Dove waste embankment area is located in a dry wash which has been naturally eroded into the bedrock. The walls of this wash are steep near its bottom and slope upward to rock ledges and cliffs which surround the embankment area. The rock walls which form the abutments for the embankment consist of alternating zones of sandstone, siltstone and mudstone along the contact of the Starpoint Sandstone and Masuk Shale. The floor of the wash consists of thinly bedded mudstone. All of these rocks form a competent foundation for the embankment material.

Although no hydrologic mapping was made of the wash prior to its filling with waste products, the available data support the conclusion that ground water does not flow from the bedrock into the embankment area. The outcrop escarpment at the stratigraphic horizon of the coal waste embankment (Starpoint-Masuk contact) has been hydrologically mapped for miles on each side of the embankment; no springs have been located or associated with this horizon. The embankment and Des-Bee-Dove Mines are located in an area void of ground water, primarily because of existing faults and escarpments that circumvent the area isolating it from the ground water flow present throughout other areas of East Mountain. Operations in the Des-Bee-Dove Mines have yet to intersect any ground water. Geologically, the rock formations in the area of the embankment dip in a northwest direction into the mountain. Any water which might flow into the strata would flow down the dip away from the fill structure.

From a geologic and hydrologic standpoint, the area of coal waste embankment is stable since the rock outcrops in the wash form competent abutments.

At the tipple, the gradient changes abruptly from 25% to 4½%. As the coal depth reaches 80 to 85 feet toward its downstream edge and the earth-rock mantle is 10 to 15 feet thick, a riprapped channel (base and sides) at the average embankment gradient of 4½% will be constructed

entirely within the upper half of the cover material. A channel with 5-foot base width requires only 2.8 feet of height to pass a 100 year-24 hour flow. The channel will be excavated to a 6-foot depth to contain 3 feet of riprap lining.

A velocity reduction apron will be constructed at the base of the slope from the Desert. A 50-foot wide fan of coarse riprap extending 50 feet downstream will divert flow into the channel.

At the discharge point of the channel, riprap facing will be emplaced completely across the downstream face of the embankment. This slope is 1v:2.6h and requires a 3-foot course of riprap to disperse flow and prevent erosion of the facing material. Channel construction will be by backhoe. Riprap will be delivered by truck and distributed upon the face of the pile by dozer.

Warehouse - Office - Bathhouse Excavation

Secondary drainage occurs in this area. The high-wall which resulted from excavation of the building site will be backfilled. About 21,000 cubic yards were removed from this site and the parking lot, and about 53,000 cubic yards will be moved to bring these slopes from the top of the coal pile to a grade of 1v:2h (Map 4-2). Since natural slope exceeds the angle of repose in many places, cuts for regrading will begin at 1v:2h, and no blasting of "high" ground will be done. Excess yardage will be spread around the edges of the

coal waste embankment particularly along the bench on the upgrade portion of the road. This construction will be all done by dozer.

Sedimentation Pond Area

Drainage from the base of coal storage pile No. 2 will follow the natural undisturbed channel. The pond will be filled with stockpiled material to the original contour and will be retopsoiled from the stockpiled soils. Revegetation will be conducted as described in the revegetation section.

Slope Stability

All reconstructed slopes are at a grade no steeper than 1v:2h. Observations and measurements of slopes in the permit area show that they have been stable at 1v:1.3h; consequently, no stability calculations have been made other than those submitted.

DES-BEE-DOVE MINE (UMC 784.13(b)(5))

REVEGETATION FOLLOWING CESSATION OF MINING

The disturbed area of the Des-Bee-Dove Mine is about 18 acres. Elevation is 7,500'. Slope varies around 33-36°. Average annual precipitation is 6-8". A southern exposure dominates the topography. A pinyon-juniper vegetation type was disturbed by mining. Important woody plants were pinyon pine, Utah juniper, curl-leaf mountain mahogany, saskatoon serviceberry and Mormon tea. Bluebunch wheatgrass, salina wildrye and Indian-rice grass were the common grasses.

Deseret Pond

The disturbed area of the Deseret Pond is 1.5 acres. Elevation is 6,800'. Average annual precipitation is 6". A salt-desert shrub vegetation type is found within the area. Exposure is southern. Common plants include cuneate saltbush, greasewood, and salina wildrye.

Species for Revegetation

Revegetation of the disturbed areas will be discussed by vegetation types. Plants selected will provide sufficient diversity, cover and productivity to meet the revegetation requirements.

Pinyon-juniper

A mixture of native species has been selected to vegetate the disturbed areas at the mine site (Table 1). Even though site differences (topography, exposure, moisture,

etc.) occur among the mines, this mix has sufficient plasticity to ensure adequate plant establishment. For the mechanics of procedure, please refer to the section below.

TABLE 1. RECOMMENDED SPECIES FOR REVEGETATION
AFTER TERMINATION OF MINING OF
THE PINYON-JUNIPER VEGETATION TYPE

Grass (P.L.S.)

Western wheatgrass	<u>Agropyron smithii</u>
Bluebunch wheatgrass	<u>A. spicatum</u>
Salina wildrye	<u>Elymus salinus</u>
Indian-rice grass	<u>Oryzopsis hymenoides</u>

Shrubs

Saskatoon serviceberry	<u>Amelanchier alnifolia</u>
Curl-leaf mountain mahognay	<u>Cercocarpus ledifolius</u>
Big sagebrush	<u>Artemisia tridentata</u>
Mormon tea	<u>Ephedra viridis</u>

Forb

Utah sweetvetch	<u>Hedysarum boreale</u>
Lewis flax	<u>Linum lewisii</u>
Palmer penstemon	<u>Penstemon palmeri</u>

Tree

Pinyon pine	<u>Pinus edulis</u>
-------------	---------------------

Salt-Desert Shrub

Table 2 gives the selected species for the revegetation. The species chosen are both drought and salt tolerant. Please refer to the section following for methodology.

TABLE 2. RECOMMENDED SPECIES FOR REVEGETATING
THE SALT-DESERT SHRUB AREA
AFTER TERMINATION OF MINING

Grass (P.L.S.)

Salina wildrye

Elymus salinus

Shrub

Cuneate saltbush
Shadscale

Atriplex cuneate
A. confertifolia

Mechanics of Revegetation

Pinyon-Juniper

The major individual steps required to accomplish the revegetation plan are:

1. Soil sampling and analyses
2. Neutralization and removing hot spots or toxic areas
3. Seed bed preparation
4. Seed planting
5. Mulching
6. Transplanting forbs and wood plants
7. Weed and pest control

On completion of the backfill and grading work, surface preparation will begin. Soil samples will be taken at intervals throughout the disturbed area and adjacent undisturbed areas to correlate soil additives. Hot spots that are identified shall be neutralized or covered as with toxic subsoils and areas of high-iron content.

The revegetation plan is to seed grasses and transplant forbs and woody plants. All disturbed areas will be graded to the most gradual slope possible. All areas with slopes too steep to allow mechanical harrowing will be dressed by hand as follows:

Steep slopes will be smoothed by hand making sure to fill in exposed rocky areas. Additaments and fertilizers applied where needed and mixed with soils by hand raking. To enhance both plant and root growth, a mixture of amonium nitrate and triple super phosphate shall be applied at a rate of 50 pounds per acre each.

After fertilizing, contour ditches 6" deep and spaced 5' vertically will be installed along the slopes. It is reasoned that the benefits of ditching would include sediment control and increased soil moisture retention.

Seeding will be accomplished by broadcasting methods and raked into the seed bed by hand. Each grass seed species (Table 1) will be planted at a rate of 5 pounds per acre or a total of 20 pounds per acre for all grasses.

Containerized forbs and woody plants will be transplanted randomly but with equal distribution among the different species at a rate of 1,000 plants per acre. Pinyon-pine will be planted at a density of 200 plants per acre.

Mulching or hydromulching shall use a liquid tackifier to insure adherence of the mulch to the slope surface. Mulching rate should approach 2 tons per acre if straw is used.

Level areas or areas where tractors are of use shall implement generally the same procedures excepting the contour ditching.

Seed beds shall be harrowed prior to seed planting. After seeding, straw or hay mulch shall be crimped by use of a disc harrow or by other means.

Transplants and tree planting will be done by hand. Application rates of materials shall remain the same as steep slope planting.

If required, a sprinkler irrigation system may be used or installed.

Revegetation monitoring shall determine if reseeding is necessary and what weed and pest control measures are needed to insure successful revegetation.

Salt-Desert Shrub

The revegetational process will be the same as explained above, except for the change in species (Table 2) and planting rate. Salina wildrye will be planted in the trenches at 20 pounds per acre. The shrubs will be planted at 400 plants per acre each.

DESERET-BEEHIVE-LITTLE DOVE MINES
RECLAMATION COSTS
SURFACE FACILITIES REMOVAL

<u>Description</u>	<u>Equipment Manpower</u>	<u>Quantities</u>	<u>Unit Cost</u>	<u>Total Cost</u>	<u>Crew Days</u>	<u>Remarks</u>
Office-Bathhouse- Warehouse Bldg.	Crane Truck/Trailer 10-Man Crew	1-Lot	1-Lot	\$ 18,000	10 Days	Structure is sheet metal over steel frame.
Tipple Bldg.	Crane Truck/Trailer 10-Man Crew	225 Tons	Wrecking \$300/Ton	\$ 67,500	24 Days	Rate of salvage 6. Tons/Day.
Conveyor System and Stacking Tube	Crane Truck/Trailer 10-Man Crew	1,000 ft.	100'/Day	\$ 18,000	10 Days	Overhead and underground.
Deseret Fan #1	Crane Truck/Trailer 5-Man Crew	1-Lot	\$1,350/Day	\$ 6,750	5 Days	
Deseret Fan #2	Crane Truck/Trailer 5-Man Crew	1-Lot	\$1,350/Day	\$ 6,750	5 Days	
Beehive Fan	Crane Truck/Trailer 5-Man Crew	1-Lot	\$1,350/Day	\$ 6,750	5 Days	
Little Dove Fan	Crane Truck/Trailer 5-Man Crew	1-Lot	\$1,350/Day	\$ 6,750	5 Days	

SURFACE FACILITIES (CONTINUED)

<u>Description</u>	<u>Equipment Manpower</u>	<u>Quantities</u>	<u>Unit Cost</u>	<u>Total Cost</u>	<u>Crew Days</u>	<u>Remarks</u>
Culinary Water Tank	Crane Truck/Trailer 5-Man Crew	1-Lot	\$1,350/Day	\$ 4,050	3 Days	
Material Storage Shed	Fork Lift Truck/Trailer 5-Man Crew	1-Lot	\$1,150/Day	\$ 3,450	3 Days	
Water System Water Tank, Pump House and Water Line	Small Crane Truck/Trailer 5-Man Crew	1-Lot	\$1,250/Day	\$ 6,250	5 Days	Includes buried water storage tank.
Underground Shop	Fork Lift Truck/Trailer 5-Man Crew	1-Lot	\$1,150/Day	\$ 3,450	3 Days	
Fuel and Oil Storage Tanks	Fork Lift Truck/Trailer 5-Man Crew	1-Lot	\$1,150/Day	\$ 3,450	3 Days	
Concrete Trash Bins	Dozer Dump Truck 4-Man Crew	2-Each	\$900/Day	\$ 1,800	2 Days	
Rock Dust Storage Tank and Feed	Small Crane Truck/Trailer 5-Man Crew	1-Lot	\$1,250/Day	\$ 2,500	2 Days	
Power Substation Lower	Small Crane Truck/Trailer 5-Man Crew	1-Lot	\$1,250/Day	\$ 10,000	8 Days	

SURFACE FACILITIES (CONTINUED)

<u>Description</u>	<u>Equipment Manpower</u>	<u>Quantities</u>	<u>Unit Cost</u>	<u>Total Cost</u>	<u>Crew Days</u>	<u>Remarks</u>
Power Substation Upper	Small Crane Truck/Trailer 5-Man Crew	1-Lot	\$1,250/Day	\$ 3,750	3 Days	
69 KV Transmission Line	REMOVED BY OTHERS (UTAH POWER & LIGHT COMPANY) -- NO COST CHARGED TO MINING.					
Telephone Line	REMOVED BY OTHERS (EMERY COUNTY TELEPHONE COMPANY).					
Miscellaneous Clean up		1-Lot		\$ 10,000	5 Days	Underground pipes, wires and yard lights.
			TOTALS	<u>\$179,200</u>	<u>101 Days</u>	

DESERET-BEEHIVE-LITTLE DOVE MINES
RECLAMATION COSTS
BACKFILL - COMPACTING - GRADING

<u>Description</u>	<u>Equipment Manpower</u>	<u>Quantities</u>	<u>Unit Cost</u>	<u>Total Cost</u>	<u>Crew Days</u>	<u>Remarks</u>
Portal Sealing	Forklift Dozer 4-Man Crew	18 Each	\$2,000	\$ 36,000	36 Days	
Backfill Portals and Crop Line	Backhoe Front-End Loader Dozer	2500 yd ³	\$3/yd	\$ 7,500	14 Days	
Drainage Control Berms	Front-End Loader Dozer	500 yd ³	\$3/yd	\$ 1,500	7 Days	
Deseret Portal						
Drain Control Berm	Dozer	250 yd ³	\$3/yd	\$ 750	3 Days	
Channel Cleaning	Dozer	200 yd ³	\$5/yd	\$ 1,000	5 Days	
Tipple						
Energy Dissapator	Backhoe Truck	250 yd ³	\$10/yd ³	\$ 2,500	14 Days	
Channel Installed, Riprap Sides and Base	Backhoe Truck	2100 yd ³	\$10/yd ³	\$ 21,000	42 Days	
File Facing with Riprap	Dozer Truck	1000 yd ³	\$10/yd ³	\$ 10,000	30 Days	

DESERET-BEEHIVE-LITTLE DOVE MINES
RECLAMATION COST
REVEGETATION - 18 ACRES

<u>Description</u>	<u>Equipment Manpower</u>	<u>Quantities</u>	<u>Unit Cost</u>	<u>Total Cost</u>	<u>Crew Days</u>	<u>Remarks</u>
Soil Testing	1 Man	--	--	\$ 200	2 Days	
Neutralization/ Fertilization	Tractor 2-Man Crew	18 acres	\$ 50/acre	\$ 900	3 Days	Includes Materials
Surface Preparation (steep slopes)	Tractor 5-Man Crew	18 acres	\$ 500/day	\$30,000	60 Days	
Seeding and Planting	Tractor 5-Man Crew	18 acres	\$2,000/acre	\$36,000	30 Days	Includes Materials
Mulching	Mulching Equipment Tractor 2-Man Crew	18 acres	\$ 500/acre	\$ 9,000	10 Days	Includes Materials
Revegetation Monitoring	1 Man	--	--	\$ 2,000	20 Days	
Weed and Pest Control	2 Men	18. acres	\$ 200/day	\$ 2,000	10 Days	
Reseeding, Planting	4 Men	18. acres	\$ 700/day	<u>\$ 3,500</u>	<u>5 Days</u>	
			TOTALS	<u>\$83,600</u>	<u>140 Days</u>	

Reclamation Cost

Total reclamation cost reflects the accumulative totals of three separate operations listed below.

Estimated work and costs are based on 1981 prices and includes all lands having been disturbed for the purpose of crushing, handling and transporting coal extracted through the Des-Bee-Dove Mines.

Reclamation for lands above the underground mines are not included as, to date, none is required with the exception of exploration work which is reclaimed on completion of the work.

Costs for reclamation of the Des-Bee-Dove Mines are:

- 1. Surface Facilities Removal...\$179,200
- 2. Backfilling and Grading\$206,250
- 3. Revegetation.....\$ 83,600
- . TOTAL FINAL RECLAMATION COST.....\$469,050

The following photographs show the Des-Bee-Dove portal area as it presently exists and as it will appear after final reclamation.

These photos were prepared under consultation with:

Jay G. Roundy
Senior Environmentalist &
Landscape Architect - UP&LCO

Herman Olieken
Industrial Artist - UP&LCO

Larry Bennett
Senior Draftsman - UP&LCO

RECLAMATION PLAN: PROTECTION OF THE HYDROLOGIC BALANCE (784.14)

Because the Des-Bee-Dove Mine workings are dry, no special provisions will have to be made to insure that water wouldn't flow from the mine portal after the mine is abandoned. The portals, however, will be sealed with a double-block wall 25 feet in from the surface. The area between the block wall and the surface will then be back-filled. This, along with the fact that the mine is dry, will insure that no water will flow from the portal after the mine is abandoned.

The Des-Bee-Dove Mine complex is located in a small, dry wash. Water in limited quantities flows down the wash only during the early Spring run-off and storms. These waters are all diverted into a 1.9 acre feet sediment pond. The size of the pond is adequate to retain water from a storm exceeding 1.5 inches in 24-hour period.

The land surface above the Des-Bee-Dove Mine workings is dry. A few springs have been identified along the west border of the mine area but no springs are present above the mine. It is highly unlikely that mining will have any effect on the hydrologic regime of this area.

HYDROLOGIC BALANCE: WATER QUALITY STANDARDS AND EFFLUENT LIMITATIONS

Throughout the life of the mine and following its reclamation after mining is completed, measures will be

taken to insure that the surface water which flows through and adjacent to the mine area meet the effluent limitation set forth in Section 817.42 of the Utah Mining Code.

Sedimentation ponds have been constructed to settle out the suspended solids which might be present in the surface waters flowing within the disturbed area. When water is discharged from the sediment ponds into the drainage, it will be monitored to insure that the effluent limitations aren't exceeded.

RECLAMATION PLAN: POSTMINING USES (784.15)

The disturbed area (portal area of the Des-Bee-Dove Mines) lies within a small, steep, dry wash. Reclamation work identified within this wash states that disturbances shall be placed back to approximate original contours. Regraded and compacted fills of the three small structures requiring reclamation in the wash after revegetation should provide equivalent cover and grazing that existed prior to mining.

Reclamation of the bathhouse structure incorporating terraces provides level areas where revegetated cover would be increased as compared to the premining steep slopes.

The waste dump structure with an area of 4 acres is additional land now usable which before mining were eroded, steep cliffs, for the most part, void of vegetation.

A key element of the reclamation plan as envisioned, is the leaving of the road system as is to allow greater use of the area by the general public.

A protective barrier will be placed across the dirt road (see final reclamation map) to prohibit casual users of the area from proceeding further than the mine area. Only Utah Power & Light Company and cattlemen who use the upper access road, will have permission to pass the barrier. Federal land agencies wishing access may secure permission on request.

Maintenance of the road system will be divided. Utah Power & Light Company and cattlemen shall maintain the upper private road, whereas, the county road maintained by the county. The majority of the county road would remain in either case as it is the only access to the county land fill located just below the mine site.

Land use after reclamation primarily would be the same as before mining, that is, grazing and wildlife habitat. The revegetation plan includes basically the same species and cover of the adjacent areas. A pinyon-juniper community would be reestablished.

Alternate land uses besides grazing and wildlife habitat would include recreation, such as hunting. The absence of water limits the potential of other uses.

To achieve the revegetation requirements, it may be necessary to have the pumping station and water line in tact to provide irrigation. This support facility would be removed on release of land by the authority.

Applicant feels that the ten years following mining (bond period), there is sufficient time to manage the vegetational establishment and growth to meet the requirements of the postmine land use as stated.

PROTECTION OF PUBLIC PARKS AND HISTORIC PLACES (784.17)

No public parks are located in or adjacent to the permit area.

Cultural resource information contained in this application was based on field surveys contracted to A.E.R.C. (Archeological--Environmental Research Corporation) and conducted under the auspices of Richard Hauck.

For lands within the permit area not covered by planned surface disturbances, but yet could be affected by subsidence, a general 15 percent random survey was conducted. Basis of this survey was extrapolated from requirements mandated by OSM for authorization to mine coal from the Des-Bee-Dove Mine. Results of this survey are contained in the report found in the Environment Section.

RELOCATION OF PUBLIC ROADS (784.18)

The Des-Bee-Dove Mine portal requires no further action for public review concerning mining within 100 feet of a public road, as exemption 761.11(a)(4)(i) applies.

SUBSIDENCE CONTROL PLAN

This section describes in further detail the Applicant's design of mine plan ensuring minimal environmental impacts, specifically surface subsidence effects of the on-going Des-Bee-Dove Mine. Operation Plan describes in detail the proposed methods of coal resource extraction and mine development. Geology Description presents the detailed geological information, site specific and general, which provides an analytical base for mine plan and subsidence control design. The following subsections describe the principal factors involved in controlling subsidence impacts resultant of the proposed mining operations.

Subsidence Damage Probability Survey

A survey has been conducted on that portion of East Mountain surface which could possibly be affected by the mining of coal from the Des-Bee-Dove Mine.

It has been determined that there are renewable resources present in the area in the forms of springs and grazing land.

A survey to locate structures on East Mountain that could be affected by subsidence has been completed and none were located above Des-Bee-Dove Mine.

Mining Methods

Utah Power & Light Company intends to minimize surface effects of subsidence by mining the coal deposit as completely as possible. All areas within the mine limits will be mined by continuous miner in order to extract the maximum amount of the coal reserve possible. No area within the mine limits is planned to remain unmined.

Methods of room-and-pillar mining as outlined in Operation Plan are specifically designed to maximize pillar extraction and promote safety. Systematic methods of pillar extraction ensures an average of 60% removal of pillars. The majority of remaining pillars eventually crush out to allow a generally even relaxation of the overlying strata.

Full extraction areas (room and pillar panels with pillar removal) are, by definition, planned and controlled subsidence areas. It is anticipated that this planned subsidence will result in a generally uniform lowering of the surface lands in broad areas, thereby limiting the extent of material damage to those lands and causing no appreciable change to present land uses. The extent of these full extraction areas is shown on Maps 3-1 and 3-2. Subsidence prediction work has shown the expected maximum planned and controlled subsidence will vary from 0 to 10 feet assuming that the total cumulative extraction from the two minable seams will not exceed 20 feet.

Subsidence Damage Prevention Measures

The proposed mining plan has been designed in such a way as to align the full extraction panels parallel to the margin faults and joints. This alignment with respect to jointing will prevent the formation of irregular sawtooth subsidence cracks in the overlying surface lands.

In order to more accurately forecast the overall extent and the amount of subsidence, Utah Power is currently conducting two separate subsidence studies, similar to those done by the NCB and Abel and Gentry, in cooperation with the U. S. Bureau of Mines.

The results of these studies will develop data which, when interpolated into proven existing formulas and models, allow the particular characteristics of the overburden on East Mountain to be analyzed as to probable behavior during and after mining.

Subsidence monitoring plans have been submitted for the Des-Bee-Dove Mine and are included in the appendix.

A site specific room-and-pillar section has been monumented and is being monitored by conventional survey methods. Results of this survey will, in the future, provide a base on which predictable subsidence can be forecasted.

Until these base line data are formulated, surface monitoring will continue.

Regarding the seeps and springs, Utah Power has been actively monitoring these, together with water generated within the mines, for some three years to date and has set up an organization with the full intention of monitoring them for the next several years.

The summary of Utah Power's annual hydrological report has been submitted to the Division under a separate cover.

The hydrologic report indicates that mining under the seeps and springs at the depths of cover of Des-Bee-Dove Mine, up to 1,600 feet does not dry up the seep or spring. This phenomenon is most probably due to the presence of bentonitic shale layers in the overburden which swell when wet forming an impervious clay layer. This healing characteristic is expected to seal subsidence cracks to prevent downward migration of water and subsequent loss of springs and other water sources.

The Des-Bee-Dove Mine will be mining some 16 feet of coal from two seams at average depths of 1,300 to 1,600 feet. Therefore, it is Utah Power's belief that the seeps and springs on East Mountain will not be adversely affected.

Mitigation of Subsidence Damage Effects

Any roads which are materially damaged by subsidence will be repaired and regraded to restore them to their pre-subsidence usefulness.

All structures that could be effected by subsidence on East Mountain have been surveyed and none are located above Des-Bee-Dove Mine.

In lieu of renewable insurance covering damages to existing structures, a bond has been secured through the District Courts for that purpose.

Subsidence Control

Utah Power & Light Company will conduct the underground mining operations so as to prevent subsidence from causing material damage to the surface and to maintain the value and reasonable foreseeable use of that surface in accordance with the preceeding subsidence control plan.

Public Notice

A plan will be submitted to the U. S. Forest Service which details the area in which mining is to take place and the planned date of the mining activity. It is anticipated that this report will also be made a part of the annual subsidence monitoring report provided to the regulatory authorities.

FISH AND WILDLIFE PLAN (784.21)

The portal facilities of the Des-Bee-Dove Mines are located in a small dry wash, a tributary to Grimes Wash. This active area (portal facilities) consists of about 20 acres and is physically separated from the remaining permit area by imposing and nearly inaccessible mountain slopes that rise over 1600 feet vertically from the active portal area.

Excepting the occasional use for exploration, the wildlife inhabitants on East Mountain are relatively unaffected during the mining operation and require no special plans other than the hydrological and subsidence monitoring now initiated.

There are no fisheries located on the East Mountain plateau within the permit area.

In contrast to the lush mountain top environment above the mines the portal acres are situated within a transition zone of the plateau with a south-eastern facing aspect. Vegetation and wildlife are sparse in comparison.

The nearest fishery is Cottonwood Creek, four miles distant.

An on-the-ground review was made in consultation with the U. S. Fish and Wildlife Service, Division of Oil, Gas and Mining, and the Division of Wildlife Resources. No critical habitat of threatened or endangered species was identified.

A 69 KV line serves as the power source for the Des-Bee-Dove complex. Mostly single pole with post type insulators, this transmission line provides sufficient phase-to-phase and phase-to-ground clearances to preclude electrical contact of raptors including bald eagles (Structure Drawing included). The structure types used for the construction are approved as eagle-safe by studies conducted by Morlan Nelson, a copy of which is on file in applicant's office, 41 North Redwood Road, Salt Lake City, Utah.

Although Grimes Wash (creek) is not a fishery it is a tributary to Cottonwood Creek (Straight Canyon) which is a fishery.

Coal dust and sediment carried by storm runoff waters are captured by a sedimentation pond installed below the mine disturbance area.

No additional land disturbance is anticipated under this five-year period.

No Riparian communities exist within the disturbed area, hence no protection is included.

Coal is transported by trucks on hard-surfaced roads. Truck covers are not necessary as the moisture of processed coal is sufficient to prevent blowing coal dust; plus the loaded coal trucks negotiating the 12% grade are limited to slow speeds.

To reduce the undue disturbance and killing of wildlife an education program for employees would be developed that incorporates the following:

- a. To reduce deer-vehicle collisions
 1. Reduce speeds on haul roads to 50 MPH.
 2. Be especially aware of deer at dawn and dusk.
 3. When deer are spotted on the roads at night, flash lights to break their entrancement.
 4. Reinforce the value of deer to each employee.
- b. To reduce raptor harassment
 1. Restrict employees from shooting at raptors, a protected species.
 2. Avoid nesting sites as human intrusion causes abandonment of nests and young.
 3. This also applies to all nests and young of wildlife as abandonment is often the result of human intrusion and disturbance.

Reclamation plans include revegetation that provides both browse and cover for larger game animals.

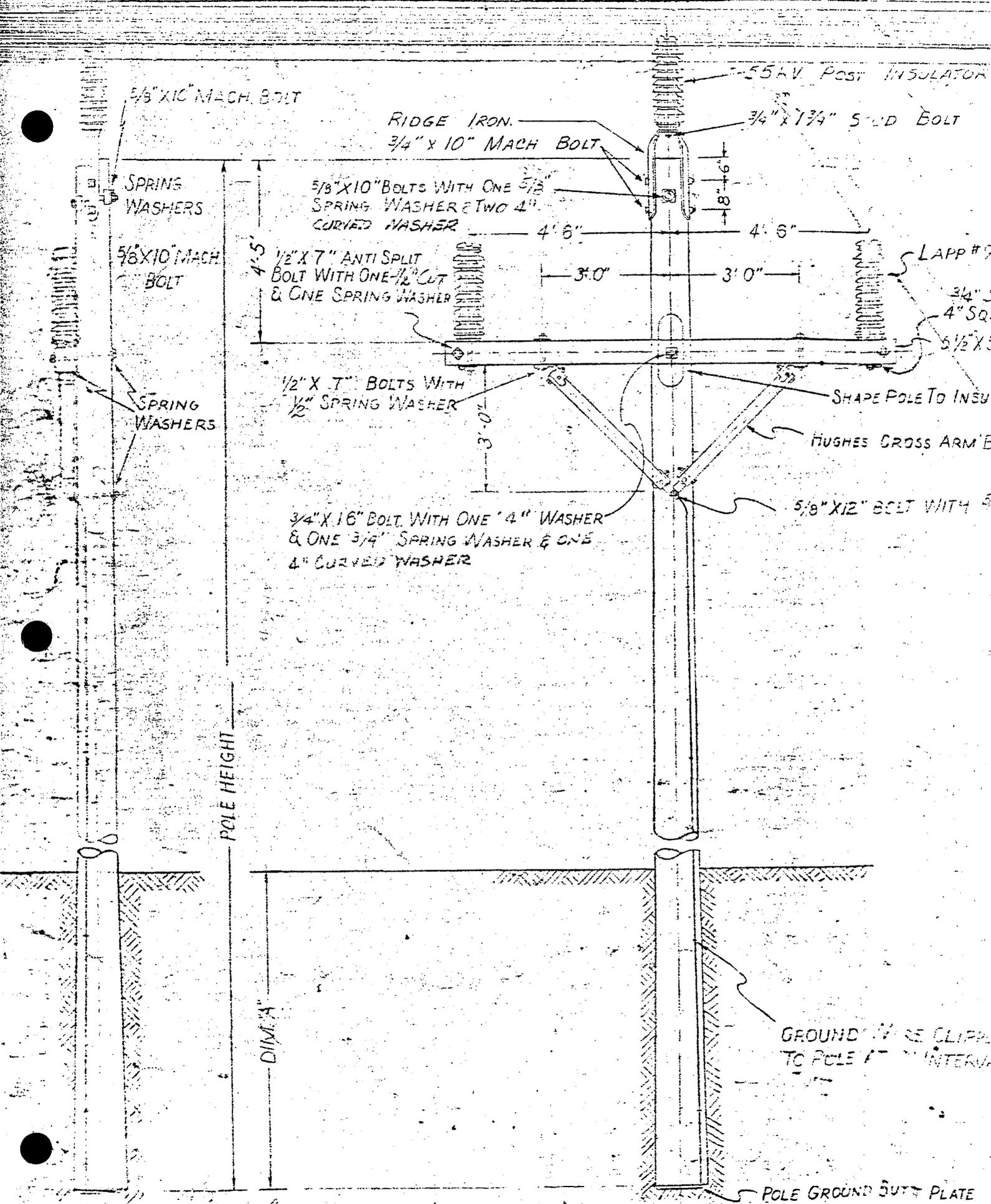
In addition to applicant's wildlife plan, the Division of Wildlife Resources has prepared an area mitigation plan that covers not only the Des-Bee-Dove Mine area but also the Wilberg and Cottonwood Fan Portal site.

This mitigation plan is included in this section.

BACKFILL - COMPACTING - GRADING (CONTINUED)

<u>Description</u>	<u>Equipment Manpower</u>	<u>Quantities</u>	<u>Unit Cost</u>	<u>Total Cost</u>	<u>Crew Days</u>	<u>Remarks</u>
Warehouse - Bathhouse						
Regrade Site	Dozer	37000 yd ³	\$3/yd ³	\$111,000	30 Days	
*Sedimentation Pond						
Backfill	Dozer Scraper	5000 yd ³	\$3/yd ³	\$ 15,000	6 Days	
			TOTALS	<u>\$206,250</u>	<u>187 Days</u>	

* Pond removal is appendaged to bond release.



APPROVED: A. C. K. [Signature]
 ASST. CHIEF ENGINEER

SMC 780.16 or UMC 784.21; FISH AND WILDLIFE PLAN
UTAH POWER AND LIGHT COMPANY, WILBERG MINE, DES-BEE-DOVE MINE
AND COTTONWOOD FAN PROJECTS

Mitigation and Impact Avoidance Procedures General to all Wildlife

Utah Division of Wildlife Resources provides the following recommendations in order to minimize disturbances and impacts on wildlife and their habitats that could be impacted during developmental, operational and reclamation operations at the Company's mining project. The recommendations address how enhancement of the wildlife resource and their habitats as discussed in UMC 783.20 can be achieved. They are also consistent with the performance standards of UMC 817.97. In instances where it would be necessary to restore or could be beneficial to enhance or develop high value habitats for fish and wildlife, recommended plant materials and rates of application are provided as "Appendix B" (UMC 817.97 and UMC 817.111 through 817.117). This list should prove useful in meeting the additional requirements to be imposed upon the operator if the primary or secondary land use will be for wildlife habitats (UMC 817.97 d 9). Additionally, "Appendix C" represents a list of commercial sources for plant materials.

The project and adjacent areas are represented by nine basic wildlife habitats which are inhabited on occasion and during different seasons of the year by about 245 species of vertebrate wildlife. The wildlife habitats and use areas for the "high interest" species from this group of wildlife have been ranked into four levels of importance. The most valuable to an individual species or ecological assemblage are the critical sites followed in respective importance by high-priority, substantial value and limited value sites. Each type of use area requires various and specific levels of protection from man's activities. Additionally, due to the variability of vegetation communities in each use area, various and specific tech-

nologies in site development will need to be evaluated for possible mitigations, enhancements of wildland habitats or the required level of reclamation. It is recommended that all land clearing impacts be designed so that irregular shaped openings are created in contrast to openings that would have straight edges.

It is recommended that the Company make significant efforts to educate all employees associated with their coal handling operation of the intricate values of the wildlife resource associated with the project and adjacent areas and the local area. Each employee should be advised not to unnecessarily or without proper permits harrass or take any wildlife. (Apprehension of wildlife violators has increased by nearly 250 percent during recent years in the region). It is especially important that wildlife not be harrassed during winter periods, breeding seasons and early in the rearing process. Exploration should be limited as much as possible during these crucial periods.

During winter wildlife are always in a depleted condition. Unnecessary disturbance by man causes them to use up critical and limited energy reserves which, often times, results in mortality. In less severe cases, the fetus being carried by mammals may be aborted or absorbed by the animal, thus reducing reproductive success of a population.

During breeding seasons, disturbance by man can negatively affect the number of breeding territories for some species of wildlife. Disturbance can also interrupt courtship displays and preclude timely interactions between breeding animals. This could result in reduced reproductive success and ultimate reductions in population levels.

Early in the rearing process, young animals need the peace and tranquility normally afforded by remote wildlands. It is also during this crucial period that young animals gain the strength and ability to elude man and other predators. This allows the young animal to develop in relatively unstressed situations and to

utilize habitats that are secure from predators. Disturbance by man can compromise this situation and result in abandonment of the young by the female, increased accidents that result in mortality to young animals or increased natural predation. It is recommended that employees be cautioned against disturbing young animals or females with young if accidentally located.

Employees associated with coal handling operations should be instructed that when wildlife are encountered during routine work that they not stop vehicles for viewing purposes. Moving traffic is less disturbing to wildlife than traffic that stops or results in out-of-the-vehicle activities. If viewing is desirable, the vehicle should only be slowed, but not stopped.

Hunting and other state and federal wildlife regulations must be adhered to by sportsmen utilizing the project area.

Mitigation and Impact Avoidance Procedures for Aquatic Wildlife

There are no recommendations for a wildlife plan that would enhance any fishery.

If ultimate operations are planned or occur that could physically or chemically impact any perennial stream beyond the impact of mere crossings, detailed reclamation plans will be required. Permanent culvert crossings exceeding a width of eight feet must have a natural bottom and devices for reducing stream velocity so that fish migration is not blocked. A reclamation plan for a stream or lake would have to provide for measurement of the physical characters of the water prior to disturbance. Such measurements should consider surface water information required in SMC 779.16, data on stream velocity, gradient, width, depth, pool-riffle ratio and substrata types.

Reclamation that would achieve development of a lake bed or stream channel similar in character to that which existed prior to disturbance should result in natural re-establishment of macroinvertebrates, macrophytes and a fish population. If merited, the Division could then introduce desired fishes into those waters.

This would adequately mitigate for disturbance and temporary loss of aquatic resources. There would be no mitigation for displacement and possible loss of other wildlife species dependent upon the aquatic wildlife as a prey source. It is believed that impacts on such species would not be significant.

It is also recommended that adequate precautions be taken to keep all forms of coal or other sediments from being inadvertently deposited along or within perennial stream channels. Similar precautions should be taken to preclude deposition of coal particles or sediments in or along other drainages from which the material could be transported during a precipitation event into a perennial stream. This would include blow-coal from haulage trucks, railroads or other transportation systems and storage piles. Control of larger coal particles from the above sources is equally important to control of fugitive dust. If needed, haulage vessels or storage sites should be covered, or the surface of the coal appropriately sprayed in order to solidify it against wind movement. Travel speeds of haulage vessels could be reduced so that coal is not allowed to leave the transportation system. The impacts of coal or other sediments on aquatic ecosystems are many and varied; therefore, sediments must be kept out of those systems.

Utah Division of Wildlife Resources reaffirms all of the recommendations in UMC 817.41 through 817.57 and UMC 817.126 for protecting the State's waters and their associated riparian and wetland zones along with the aquatic wildlife resource.

Mitigation and Impact Avoidance Procedures for Terrestrial Habitats

It is recommended that all wetland and riparian habitats be maintained. Roads and other facility developments should not destroy or degrade these limited, highly productive and unique habitats. Roads crossing through those areas should do so in a manner that is least damaging to the habitat. Wetlands and riparian habitats are ranked as being of critical value and are the most productive sites in terms of herbage and biota produced as compared to other local habitat types. It is probable

that a majority of the vertebrate wildlife that inhabit the project area make some use of riparian or wetland areas.

It is important to note that roads and other surface facilities to be constructed should as far as practicable be placed at sites where they will not compromise wildlife or their use areas. Also, surface facilities, including roads, should be screened if possible from wildlife use areas by vegetation or terrain.

In situations where wildland habitats have been or will be disturbed, reclamation is required. Also, there are sites where development or enhancement of wildland habitats through vegetation treatments and/or seedings and transplants of seedlings could benefit wildlife. "Appendix B" depicts the Division's recommendation for plant materials to be utilized for various wildlife habitats on wildland treatments that are intended to benefit wildlife. If circumstances arise where seed or seedling transplants for a recommended plant species are not available, suitable alternates are also recommended.

Seedling transplants from nursery stock as well as nearby rangelands would also be acceptable for some wildland treatments.

Appendix C represents an exhaustive list of commercial sources for plant materials for use in wildland treatments.

Temporary control of rodents may be required to ensure a successful rangeland treatment. It is recommended that the county agent be consulted in this area of concern. Poisoned oats are the most common and acceptable method for rodent control; however, only licensed persons may apply the treatment.

Currently, there are some new concepts in methodology for revegetation that are being successfully implemented in other parts of the nation and world. One promising method is a procedure where a large scoop removes, from a natural and stabilized site, a small area of earth intact with vegetation and subsurface soils for placement on a site to be restored. This same procedure can be utilized when disturbing pristine sites, except that the native vegetation is stored for use in

latent reclamation. Another meritorius method for stimulating natural revegetation, in combination with other reclamation techniques, is to plan facility developments so that islands of natural, native vegetation remain. This will allow for natural vegetation to spread from the islands. These techniques can also be useful for enhancement of poor quality sites that currently exist on the mine plan area.

Encapsulation of seed and fertilizer for several releases over a period of years after a single application is a new and possibly advantageous procedure. This technique along with soil stabilizing structures has been successfully used in South Africa. Dr. J. Van Wyk in the Department of Botany at Potchetstroom University in South Africa could provide additional information on this new technique.

There are also new specialized techniques coming to the forefront for stabilization of problem sites such as roadbanks and steep slopes. It is important that these sites be promptly and permanently revegetated in order to reduce siltation into local riverine systems. This will mitigate for damage to aquatic wildlife populations and habitats from siltation. Enhancement of existing problem sites or reclamation of disturbed sites can mitigate for salt loading of local river systems. It is believed that natural, nonpoint sources represent 50 percent of the salinity in the upper basin of the Colorado River system into which this mine plan area drains.

It is recommended the Company make numerous contacts with appropriate agencies, institutions and persons to ensure that enhancement or reclamation projects achieve the required degree of permanency, plant diversity, extent of cover and capability of regeneration to ensure plant succession. Generally speaking, seeding should be accomplished as late in the fall as possible. Seedling transplants need to be coordinated with local soil moisture conditions which are usually at optimum in the early spring just as the snow melts.

It is paramount that suitable vegetation be maintained and/or re-established if the life requirements of wildlife are to be satisfied in the postmining period. Success in this area of concern along with cessation of man's disturbances will likely result in a natural reinvasion and the resultant inhabitation by most wildlife species of an impacted site.

It is important to note that enhancement or reclamation projects that are to benefit wildlife must be properly designed so that all the life requirements of the target species are considered in conjunction with forage. Water must be provided or be present and thermal cover along with escape and hiding cover has to be in abundance. Loafing areas and travelways between the many types of use areas must also be provided. In order to meet these goals, a considerable degree of consultation will be required between the Company and Utah Division of Wildlife Resources.

As a service and also to ensure that the needs of wildlife are met, the various expertism within the Division of Wildlife Resources are available to the Company for consultation. For the most part, Larry Dalton, Resource Analyst, for the Southeastern Regional office at 455 West Railroad Avenue in Price, Utah 84501 (phone 637-3310) will coordinate any needed contacts. Richard Stevens, Wildlife Biologist, at the Great Basin Research Center, Box 704, in Ephraim, Utah 84627 (phone 283-4441) is available for consultation and site specific analysis concerning species for vegetation plantings, timing and techniques to achieve the best results.

In instances where revegetation projects are to be planned over coal waste areas, heavy metal uptake by the plants must be evaluated. It is recommended that the Company initiate an appropriate long-term monitoring program to determine the magnitude and resolutions, if needed, for this problem.

It is recommended that persistent pesticides not be utilized on the project area. Other alternate pesticides or forms of control should be utilized.

All hazards associated with the project operation should be fenced or covered to preclude use by wildlife; of special concern would be sites having potential to entrap animals or toxic materials.

Mitigation and Impact Avoidance Procedures for Amphibians and Reptiles

Enhancement or development of habitats that provides a diversity of vegetation will benefit amphibians and reptiles. It is important to note that all of these species are protected by Utah law. Due to the myriad and myths that surround these animals, it is urged that individual specimens not be destroyed. This is especially true for snakes since they are a valuable component of the ecosystem.

Snake dens are ranked as being of critical value to the population and are protected by law. If a den is located, it should be reported to the Utah Division of Wildlife Resources. Snake dens can be moved by the Division, but only with intensive efforts that may take a year or more (snakes are caught and removed in the spring and fall). Thus, construction of facility developments may take place in denning locations if there is sufficient lead time to relocate the occupants.

Mitigation and Impact Avoidance Procedures for Avifauna

It is recognizable that development and operation of a mining project will in some cases negatively impact many avian species through physical destruction of habitats and continual disturbance that makes other habitats unavailable or less desirable to an individual bird. It is also true that impacts that are negative to one species may be beneficial to another species. It is recommended that the Company plant native and/or ornamental berry producing shrubs around surface facilities. When mourning doves are a target species, sunflowers or blazing star should be planted. This will provide food and cover for many of the smaller species of birds, resulting in enhancement of their substantial value and high-priority habitats. This action would also mitigate for disturbances and destruction of avifauna habitats at other sites associated with project operations.

It is important to note that the nests of all avifauna (except the house sparrow, starling and rock dove) when active and their eggs are protected by federal (Federal Migratory Bird Treaty Act) or state laws (Utah Code 23-17-1 and 23-17-2). All avifauna utilize a nest during their reproductive process. Dependent upon the species, some nests are well developed while others may be represented by only a scrape on the ground. These sites when being utilized are critical to maintenance of individual bird populations; each species has a specific crucial time period in which the nest is occupied. It is during this crucial period that the nest must be protected from disturbance.

Several species of raptors frequent the project area. Their nests when active should not be disturbed and abandoned stick nests are never to be damaged. Every effort should be made to eliminate man's disturbance within visual sight or one-half kilometer radius of an active raptor nest. This distance would have to be increased to a one-kilometer radius if the cause for disturbance were to originate within view and from above the nest. This effort is demanded in the instance of golden eagles and cliff nesting falcons since they are sensitive to disturbance and could abandon the nest. Termination of man's use of a site would not be required if eagles or falcons constructed their nest after mining had been initiated, since it would demonstrate the individual bird's willingness to tolerate mining activities and the associated disturbance by man.

Roost trees for eagles, if located, must not be disturbed or destroyed. Similarly, activities planned for high-priority concentration areas of eagles must be designed and implemented so that they are not of significant disturbance to the birds.

As a general comment, whenever active raptor nests are observed or roost trees for eagles located, they need to be reported to the Utah Division of Wildlife Resources and the U.S. Fish and Wildlife Service.

Design and construction of all electrical power lines and other transmission facilities shall be designed in accordance with guidelines set forth in "Environmental Criteria for Electric Transmission System" published by the USDA and USDI in 1970 and/or the REA Bulletin 61-10 "Powerline Contacts by Eagles and Other Large Birds." It is also recommended that placement of utility poles over flat or rolling terrain be planned so that they are out of view of roads or at least 300 meters away from any roads. This will lessen opportunity for illegal killing of these valuable birds, since the poles can serve as suitable hunting perches for raptors. In some instances poles can result in an extension of raptor hunting territories, which would represent a beneficial impact.

During the crucial period of December through February spruce-fir forests and aspen forests need to be protected from man's disturbance so that blue grouse and ruffed grouse will not be impacted. Destruction of these wildlife habitats at any time of the year need be minimized due to their value to wildlife.

During the spring period (mid-March through mid-June) care needs to be taken that male blue grouse are not disturbed or precluded from establishing breeding territories. Similar precautions need be taken for male ruffed grouse (March through May) in the area of drumming logs.

Mature trees with natural cavities and dead snags need to be protected for use by cavity nesting birds. Trees with such a character are ranked as being of critical value to cavity nesting birds. The project should be planned so that three such trees are left standing per acre within 500 feet of forest openings or water and two such trees per acre in dense forested areas.

Mitigation and Impact Avoidance Procedures for Mammals

The lodges, nests and dens of all mammals or roosts in the instance of bat like mammals represent a critical use area for maintenance of their individual populations. The crucial period for any species is when the lodge, den, nest or roost is occupied. Therefore, such sites for any mammal must be protected from

disturbance during that period when it is being utilized.

Many species of mammals develop food caches in order to carry individual animals or family groups through periods when they cannot forage. Such sites are of critical value to maintenance of their populations and if located should not be destroyed or subjected to regular disturbance by man.

It is important to realize that within natural ecosystems there exists a predator-prey relationship. One specie of animal may represent a prey source for other species. Therefore, it is important that project operations be designed and implemented so as to not unnecessarily disturb or destroy any wildlife or their habitats.

Big game ungulates--mule deer, moose and elk--each have seasonal use areas ranked as being of critical value to an individual herd. Such sites need to be protected from any of man's activities or developments that could result in destruction, loss or permanent occupancy of the site by man or has facility developments. If these types of impacts cannot be avoided the site must ultimately be reclaimed and revegetated. Also, critical valued areas need protection from disturbance during their appropriate crucial period.

High-priority valued use areas for all wildlife and particularly big game ungulates need to be protected from man's activities or facility developments. Actions that would result in loss or permanent occupancy of significant acreages (25 or more acres) of habitat are of special concern. In any event impacts to high-priority valued areas should be limited and ultimate reclamation planned. Many impacts can be avoided simply by precluding exploration, developmental or other activities during the period of time when a high interest specie is present.

Haulage of coal between the various mine projects and distribution points should be planned so that impacts to wildlife are lessened; of special concern is haulage of coal through wintering areas for big game. It is recommended that the

Company develop coal haulage contracts that require personnel involved with coal haulage to use extreme caution so that accidental collisions between motor vehicles and big game are reduced. Without doubt, a reduction in speed across winter ranges would alleviate this problem during the period between November 1 and May 15 each year.

At present the most successful and cost effective technique for reducing deer-highway mortality is a system of warning reflectors. This system (manufactured by Streiter Corporation, 2100 Eighteenth Avenue, Rock Island Illinois 61201 and known as "Swareflex") is only of value at night time, but it is during darkness that most deer-highway mortality occurs. Strieter Corporation describes the effect of the reflector system as follows: "The headlights of approaching vehicles strike the wildlife reflectors which are installed on both sides of the road. Unnoticeable to the driver, these reflect red lights into the adjoining terrain and an optical warning fence is produced. Any approaching wildlife is [are] alerted and stops or returns to the safety of the countryside. Immediately after the vehicle has passed, the reflectors become inactive, thereby permitting the animals to cross safely".

Installation of a wildlife warning reflector system, a reduction in speed of coal-haulage trucks and other mine related traffic and increased awareness of wildlife values by mine associated employees should result in a reduction of deer-highway mortality problems. Such a reduction would represent satisfactory mitigation.

In instances where conveyors, slurry lines or any other structure having potential to be a barrier to big game movement is to be developed, passage structures must be provided. Generally speaking overpass and underpass type structures are recommended in order to allow passage of big game to habitats either side of any barrier. These crossings should be placed at the points to be identified from in-

tensive study of big game movements in relation to the mine plan area. Such study would not be required if the structure was adequately elevated to allow uninhabited passage of big game along its entire length.

Underpasses should have a minimum clearance of three meters maintained across a span of at least five meters. Overpasses should be designed as a circular earthen ramp with the barrier bisecting the ramp into two equal halves as follows:

On either side of the conveyor a half-round ramp with a slope no greater than 3:1 on a five meters wide path placed at an angle 90 degrees to the conveyor and tapering around to a slope of 5:1 at paths adjacent and parallel to the conveyor. The platform over the conveyor should be concrete or some other material that would not echo when being crossed by big game and should be of character similar to rock or natural earth.

Soils associated with either crossing style should be of the A or B horizons to allow for development of vegetation. Vegetative cover must be established in association with all crossing sites. This will lessen anxiety of individual animals using the site through development of a natural appearing environment.

Mature pinion or juniper trees and an abundance of browse plants need to be placed proximal to crossing points in order to provide a safe travelway. The browse plants will also serve as a permanent attraction for big game to crossing points. Additionally, a mixture of grass and forb seeds should be broadcast over each crossing point to stabilize the soil and enhance the forage situation.

Appropriately sized boulders may need to be placed at crossing sites in order to control off-road vehicles utilized in outdoor recreation.

Industrial developments are encouraged on habitat use areas that are ranked as being of limited value to wildlife. It should be noted, however, that reclamation is ultimately expected on any wildlife use area, regardless of its value to wildlife.