

the striped skunk. Obviously, the breeding and rearing activities of these nonmigratory species occurs within the proposed impact area and their dens and burrow systems are important to maintenance of their populations; however, it is highly unlikely that there will be any serious long term impact created by the proposed actions of this specific project. After subsidence occurs, new burrows will be built or old ones reconstructed. These species are widespread and adaptable to the activities of man.

Small Mammals

Although small mammals do not qualify individually as high interest species, they represent a significant part of the ecosystem. The majority are herbivores and are the primary source of food for higher trophic levels, particularly raptorial birds, canids, and felids. This trophic importance warrants consideration. Since this mining project only involves the expansion of an ongoing operation, there will be little habitat loss due to construction and operation of additional surface facilities. Therefore, subsidence and its impact on underground burrow

systems is the primary concern. The potential exists for caving in burrows and/or changing burrow continuity due to fracturing of the strata. Although this would temporarily alter the population density and age structure, recovery would be imminent and rapid since the breeding population contiguous and within the localized area of impact would not be lost. Additionally, the population densities are more than adequate to supply the limited number of predators present, particularly raptorial birds, that utilize the resource.

Birds

The greatest impact on birds will occur at the Mine Site area. However, because of the vast area of this same habitat type in Emery County and the status of the birds involved, no serious impacts are anticipated. Since the high elevation sites included in the Permit area will be essentially undisturbed, no lasting impacts are expected.

Amphibians

Because of the wide distribution pattern of the three amphibian species that might inhabit the mine permit area, it is doubtful that the proposed action

would seriously impact the whole population.

Reptiles

The reptiles that inhabit the area under discussion are also found in many similar habitats; therefore the proposed action would not seriously impact the reptilian populations. If a denning site for any reptile species were discovered during the construction of the mine or portals, it should be preserved until proper procedures to move the den site to a new location were implemented by the proper UDWR personnel. This is relatively easy to do and should cause little concern.

10.5 MITIGATION AND MANAGEMENT PLANS

Mitigation of mining impacts on and management of wildlife are usually considered and the plans for implementation approved prior to any perturbation. These actions often follow one of three general forms: (1) design of facilities and access or transportation modes to minimize impacts, (2) operation of the mine and associated facilities to minimize impact, and (3) enhancement of wildlife habitat both in the vicinity of and away from the mine

in order to mitigate losses that may occur.

Since no impact to the perennial waters of the permit area is expected in the foreseeable future, no special mitigation plan concerning Bear or Trail Creek is presented here. Both creeks were monitored for water quality condition for the past two years with monthly samplings in order to acquire a baseline description of the resource. This baseline will provide a solid ground for future impact analysis and mitigation planning if the need arises.

In new mine operations it is easy to suggest, provide and implement mitigative and management measures, but in the case of the Bear Canyon Mine, which is already in operation preconstruction design and associated mitigation and management does not apply. The terrestrial wildlife inhabiting and utilizing the area of concern are accustomed to the present facilities and have adjusted their behavior, including migration patterns, so that change would be of more impact than would retaining the status quo.

The new construction areas do warrant mitigation and management action. Construction and operation of the scalehouse, stockpile area and road could

potentially disturb wildlife. To minimize habitat disturbance and loss, surface activity will be kept to a minimum.

The mine activities will take into consideration potential conflict with deer and elk reproductive activity and the small acreage involved will be restored as quickly as possible by redistribution of topsoil within the disturbed area, with immediate reseeding and replanting of native seeds and vegetation. Because of the small size of the area, natural reseeding will also occur from the surrounding area. The seral stage habitat created will be beneficial to deer, who readily utilize seral stages of mixed conifer-aspen forest.

There will be minimal additional surface activity and disturbance of less than two acres which will reduce habitat loss and minimize human activity on the surface during the winter range.

The topsoil pile extension area is proposed for a site within mule deer wintering range. The area will be reseeded and revegetated with native species that are proven for their value as winter browse for mule

deer and as a bird habitat. The most successful methods known to management agencies will be used. Care will be taken to control detrimental wildlife use while the area is stabilizing.

Construction of the Mine Site and Haul Road would be sources of disturbance. Habitat would be lost temporarily during construction and permanently where the mine is located. Since this is in a wintering area the same community reestablishing and augmenting techniques would be used. The terrain is such that established trails do not exist.

Little riparian habitats exist within the area, there will be little impact by the proposed action. All water is ephemeral (class 6), but since water is such a limiting resource to game animals, care will be taken to prevent disturbance, erosion, or coal deposition in the ephemeral channels. Roads will be routed or acceptable crossings built to avoid disturbance or erosion. Coal will be wetted to prevent blowing if necessary.

As determined in consultation with UDWR, all hazards associated with the expansion and mine operation will be covered, buffered or fenced to prevent damage to wildlife of concern.

Since there are crucial critical periods in the life history of high interest species such as mule deer and elk, the applicant will communicate such to their employees who will be admonished to avoid all unnecessary disturbance and harrassment of wildlife species. In addition, all employees will be required to view the film "Coal Mining and Wildlife", as a tool to educate the mine personnel on there role in safeguarding Utahs wildlife.

In any situation not previously mentioned where wild-life habitats are disturbed by this proposed action, reclamation will be implemented by the best available methods and agreeable to UDWR and the appropriate authorities will be consulted to determine the method of control. No control measures will be used without prior approval by all parties concerned.

10.6 STREAM BUFFER ZONE DETERMINATION BY DOGM

Current surface facilities are in the upper reaches of the Bear Creek drainage, which is a tributary of Huntington Creek drainage. Appropriate sedimentation ponds have been constructed. This coupled with coal pile drainage ditches, clear water diversions, water bars, and wind erosion control measures within Co-op disturbed areas, will assure protection from

Since there are crucial critical periods in the life history of high interest species such as mule deer and elk, the applicant will communicate such to their employees who will be admonished to avoid all unnecessary disturbance and harrassment of wildlife species. In addition, all employees will be required to view the film " Coal Mining and Wildlife" as a tool to educate the mine personnel on their role in safeguarding Utahs wildlife.

In any situation noe previously mentioned where wildlife habitats are disturbed by this proposed action, reclamation will be implemented by the best available methods and agreeable to UDWR and the appropriate management agencies. The old road up Bear Creek is an example of mitigation which will be completed by October, 1984.

UDWR authorities will be consulted, in the event a need for pesticides become necessary to control rodents or insects during reclamation. No control measures will be used without prior approval by all parties concerned.

Raptor nests will be safeguarded from subsidence by maintaining a minimum of a 100' barrier to the outcrop.

10.6 STREAM BUFFER ZONE DETERMINATION BY DOGM

Current surface facilities are in the upper reaches of the

Bear Creek drainage, which is a tributary of Huntington Creek drainage. Appropriate sedimentation ponds have been constructed. This coupled with coal pile drainage ditches, clear water diversion, water bars, and wind erosion control measures within Co-OP disturbed areas, will assure protection from mining impact of aquatic resources far downstream from the mine. Thus, no aquatic biological community determinations have been made relative to surface activities.

10.7 FISH AND WILDLIFE MONITORING

Bear Creek does not warrant a biological or habitat monitoring effort since it is naturally of poor quality

Trail Creek is a marginal quality stream and as such should have a baseline description of its quality. Data collected will be correlated with water quality and hydrology measurements discussed in Chapter 7. If subsidence should become evident in the drainage area that contributes to Bear Creek, or Trail Creek monitoring of aquatic macroinvertebrates and habitat changes will be enstated using approved methodology to collect data as the base for impact evaluation.

Co-Op has committed to monitor all existing power transmission lines in order to determine use by raptors. In the event use is observed, Co-Op will take all necessary measures to ensure the poles and/or structures are safe. All new poles and power

transmission facilities will be constructed to be raptor protected. See Appendix 10-C.

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APPENDIX 10B

Scientific Names for Mammals, Amphibians and
Reptiles of the Plateau Mine Permit Area

<u>COMMON NAME</u>	<u>SCIENTIFIC NAME</u>
<u>Mammals</u>	
Badger	Taxidea taxus
Bat, big brown	Eptesicus fuscus
Bat, Brazilian free-tailed	Tadarida brasiliensis
Bat, hoary	Lasiurus Cinereus
Bat, silver-haired	Lasionycteris noctivagans
Bat, Townsend's big-eared	Plecotus townsendi
Bear, black	Ursus Americanus
Bobcat	Lynx rufus
Chipmunk, cliff	Eutamias dorsalis
Chipmunk, least	Eutamias minimus
Chipmunk, Uinta	Eutamias umbrinus
Cottontail, desert	Sylvilagus audoboni
Cottontail, Nuttall's	Sylvilagus Nuttalli
Coyote	Canis latrans
Deer, mule	Odocoileus heminous
Elk (wapiti)	Cervus elaphus
Ermine	Mustela erminea
Fox, gray	Urocyon cinereoargenteus
Fox, red	Vulpes fulva
Gopher, northern pocket	Thomomys talpodes
Hare, snowshoe	Hepus Americanus
Jackrabbit, black-tailed	Hepus Californicus
Jackrabbit, white-tailed	Hepus townsendi
Lion, mountain	Felis concolor
Marmot, yellow-billed	Marmota flaviventris
Marten	Martes americana
Mouse, deer	Peromyscus Maniculatus
Mouse, Great Basin pocket	Perognathus parvus
Mouse, pinyon	Peromyscus truei
Mouse, western harvest	Reithrodontomys megalotis

COMMON NAME

SCIENTIFIC NAME

Mammals (con't)

Myotis, California	Myotis californicus
Myotis, fringed	Myotis thysanodes
Myotis, little brown	Myotis lucifugus
Myotis, small-footed	Myotis leibii
Porcupine	Erethizon dorsatum
Prairie dog, white-tailed	Cynomys leucurus
Raccoon	Procyon lotor
Rat, Ord's kangaroo	Dipodomys ordi
Ringtail	Bassariscus Astutus
Shrew, dusky	Sorex obscurus
Shrew, masked	Sorex cinereus
Shrew, Mirriam's	Sorex mirriami
Skunk, striped	Mephitis mephitis
Squirrel, northern flying	Glaucomys sabrinus
Squirrel, red	Tamiasciurus hudsonicus
Squirrel, rock	Spermophilus variegatus
Squirrel, Uinta ground	Spermophilus armatus
Squirrel, white-tailed antelope	Ammospermophilus leucurus
Vole, Montane	Microtus Montanus
Vole, sagebrush	Lagurus curtatus
Weasel, long-tailed	Mustela frenata
Woodrat, bushy-tailed	Neotoma cinerea
Woodrat, desert	Neotoma lepida

Amphibians

Frog, western leopard	Rana pipiens
Toad, Woodhouse's	Bufo woodhousei
Toad, western spadefoot	Scaphiopus hammondi

COMMON NAME

SCIENTIFIC NAME

Reptiles

Boa, Rocky Mountain rubber	Charina bottae
Kingsnake, Utah mountain	Lampropeltis pyromelana
Lizard, fence	Sceloporus undulatus
Lizard, sagebrush	Sceloporus graciosus
Lizard, mountain short-haired	Phrynosoma douglasi
Racer, western or yellow-bellied	Coluber constrictor
Rattlesnake, Midget faded	Crotalus viridus
Snake, gopher	Pituophis melanoleucus
Snake, milk	Lampropeltis triangulum
Snake, night	Hypsiglena torquata
Snake, wandering garter	Thamnophis elegans
Whipsnake, striped	Masticophis taeniatus

Please remove the single page map at the end of Chapter 10 of the Bear Canyon MRP that is labeled Appendix 10-C, RAPTOR SURVEY, and insert this completed Appendix 10-C in its place.

Thank you

APPENDIX 10-C
RAPTOR SURVEY

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DIVISION OF
OIL, GAS & MINING



DIVISION OF WILDLIFE RESOURCES

DOUGLAS F. DAY
Director

EQUAL OPPORTUNITY EMPLOYER

1596 West North Temple/Salt Lake City, Utah 84116/801-533-9333

November 17, 1983

Reply To SOUTHEASTERN REGIONAL OFFICE
455 West Railroad Avenue, Box 840, Price, Utah 84501
(801) 637-3310

Melvin A. Coonrod
Co-op Mining Company
P. O. Box 1245
Huntington, UT 84523

Dear Mel:

In regard to the September 20, 1983 helicopter survey for raptors of the Co-op Mining Company's mine plan area in Trail Canyon and Bear Creek Canyon, the following is offered for your information.

The survey was conducted at approximately 8:30 a.m. Weather conditions were ideal for conducting such a survey. A Jet Ranger helicopter was utilized and participants in the survey were Larry Dalton, Resource Analyst for Utah Division of Wildlife Resources; Mel Coonrod—Environmental and Permit Coordinator for Co-op Mining Company, and Wendall Owens, also representing Co-op Mining Company. The survey was initiated in Trail Canyon and proceeded southeasterly along the escarpment toward Bear Creek Canyon. As you know, over the years this same area has been surveyed by helicopter. The first survey was in 1981 and was conducted by the U.S. Fish & Wildlife Service. A second survey was conducted in 1982 again by the U.S. Fish & Wildlife Service. Both surveys were conducted during the spring season when the birds were on nest. Figure 1 and Table 1 identify the nest locations, their annual use status, and condition. Over the years a total of 7 nests have been identified. All of the nests originally appeared to be those of Golden Eagles. However, re-evaluation in 1982 and again in 1983 show that it is quite likely that nest #7 is a Buteo, rather than a Golden Eagle nest. During the last 3 years the only nest to show evidence of activity was nest #7. It had greenery in it this fall, which is indicative that it was active during the 1983 breeding season. Since activity at the nest has only been observed during the fall season, it cannot be determined whether or not the egg produced young during the 1983 nesting period.

Mel, I want to express the Division's appreciation to Co-op Mining Company for extending the opportunity to use their helicopter to look over the nesting situation in the Trail and Bear Creek Canyons. Again, thank you for your cooperation and consideration of Utah's Wildlife Resource.

Sincerely,

John Livesay
GOVERNOR
Scott M. Matheson

DEPT. OF NATURAL RESOURCES
Gordon E. Harmston
Exec. Director

WILDLIFE BOARD
Roy L. Young — Chairman
Lewis C. Smith L. S. Skaggs
Warren T. Harward Chris P. Jeffas

Table 1. Annual use status and nest condition for Golden Eagle nests associated with the Co-op Mining Company's Trail Canyon and Bear Creek canyon coal mines.

<u>Nest Location</u>	<u>1981¹</u>	<u>1982¹</u>	<u>1983²</u>
1	Inactive ³	Inactive ³	Not found
2	Inactive ³	Inactive ³	Not found
3	Inactive ⁴	Not found	Not found
4	Inactive ⁴	Not found	Not found
5	Inactive ⁴	Not found	Not found
6	Inactive ⁴	Inactive ⁴	Not found
7	Inactive ⁴	Inactive ^{4,5}	Active ⁵

1. Helicopter survey during spring season - U.S. Fish and Wildlife Service personnel.
2. Helicopter survey during fall season - Utah Division of Wildlife Resources personnel and mine personnel.
3. Dilapidated condition.
4. Condition not noted.
5. Nest is small and may be a Buteo rather than Golden Eagle.
6. Nest was in good repair and showed evidence of greenery placed during 1983 nesting season. It is a small nest and may be a Buteo. Since this was a fall survey, it cannot be concluded if the nest produced young during 1983.

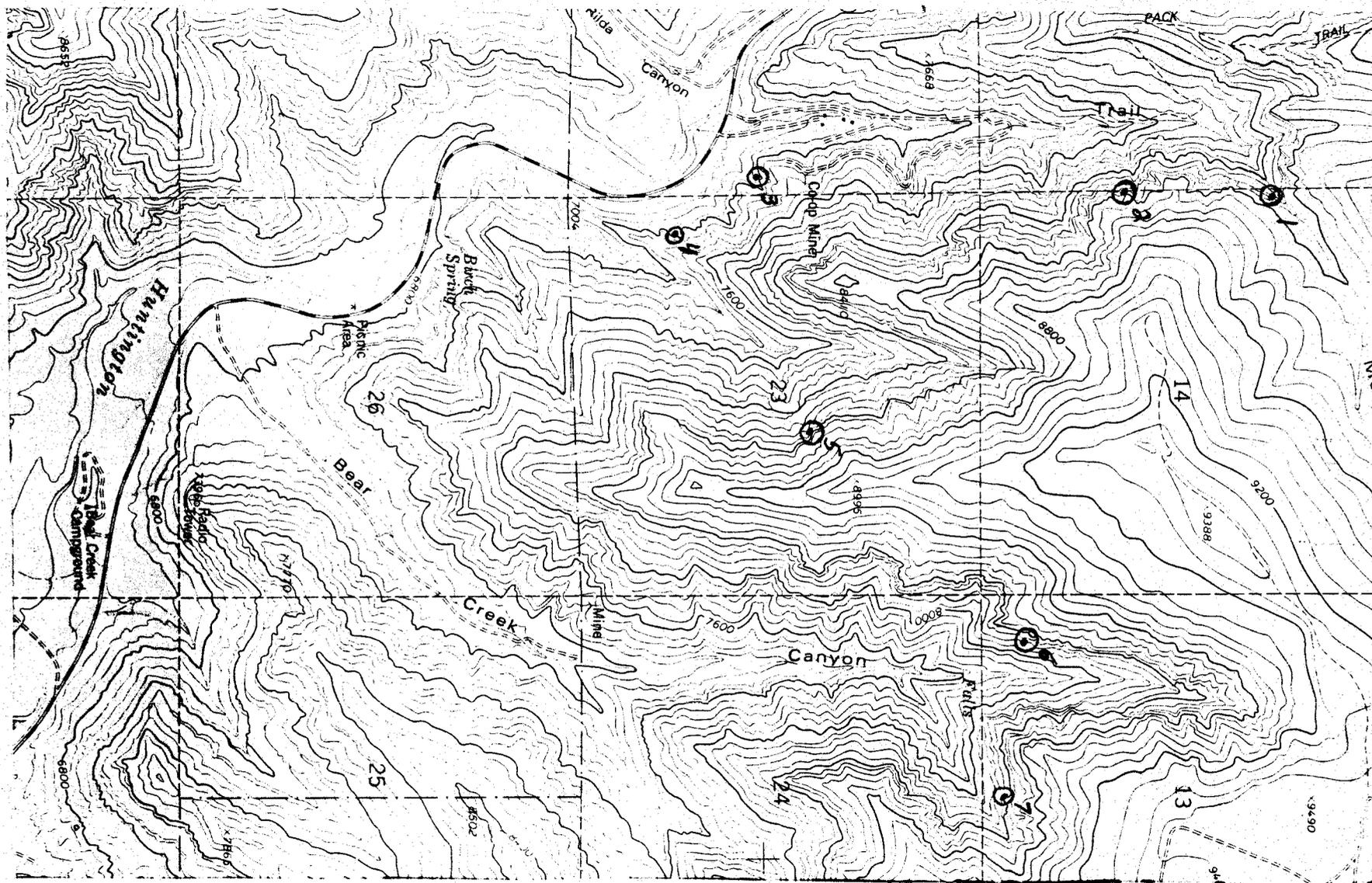
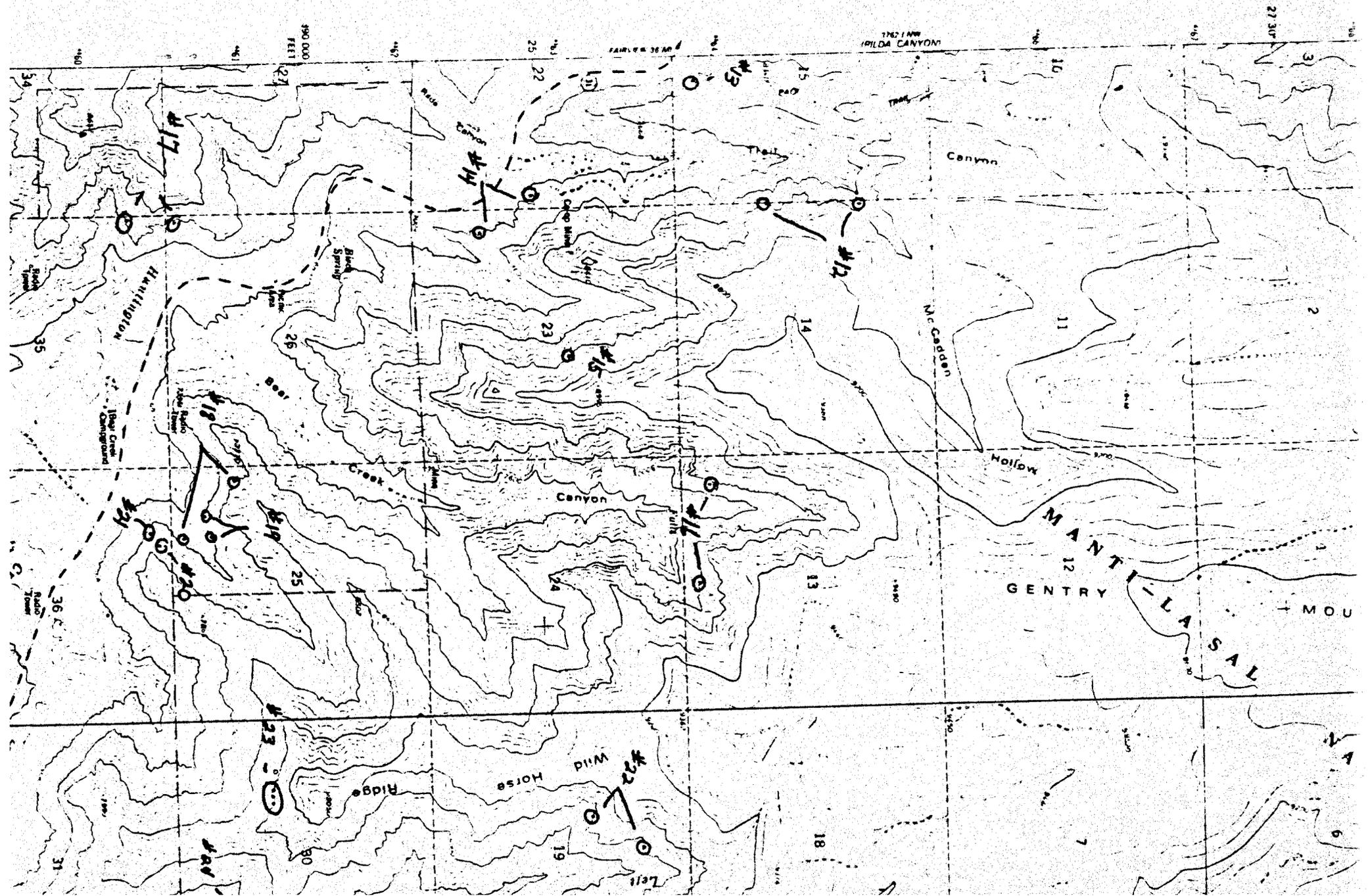
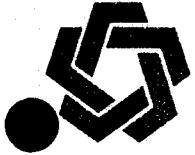


Figure 1. Raptor cliff nest locations associated with the Co-op Mining Company's Bear Creek Canyon coal mines in Township 16 South, Range 7 East, Emery County, Utah.

1
Raptor Survey





STATE OF UTAH
NATURAL RESOURCES
Oil, Gas & Mining

Scott M. Matheson, Governor
Temple A. Reynolds, Executive Director
Dianne R. Nielson, Ph.D., Division Director

4241 State Office Building • Salt Lake City, UT 84114 • 801-533-5771

April 11, 1984

CERTIFIED RETURN RECEIPT REQUESTED
P396 996 958

Mr. Wendell Owen
Co-Op Mining Company
P. O. Box 1245
Huntington, Utah 84528

RE: Raptor-proofing of Power
Poles and Technical
Deficiencies under UMC 817.97
(March 1984 DOC/TD Document)
Co-Op Mining Company
Bear Canyon Mine
ACT/015/025, Folder No 2 & 13
Emery County, Utah

Dear Mr. Owen:

On July 27, 1983, the Division of Oil, Gas and Mining (Division) sent a letter to Co-Op Mining Company requiring all power poles associated with mining in Bear Canyon to be modified regarding raptor-proofing. Prior to this letter, a survey (June '83) was conducted by the U. S. Fish and Wildlife Service (USFWS) and the Division to determine whether or not power poles were raptor-safe and/or whether or not expected raptor use of the Bear Canyon area warranted pole modification. It is apparent that confusion has arisen with regards to the results of the June 1983 and the July 27, 1983 letter to Co-Op. This present communication will serve as clarification regarding Co-Op's needs for raptor proofing power poles at the Bear Canyon Mine.

The USFWS wrote a letter to the Division, July 6, 1983, summarizing the June '83 survey of Co-Op's power poles. This letter stated the following:

Mr. Wendell Owen
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April 11, 1984
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Mr. Lynn Kunzler, Mr. Joe Helfrich, and Ms. MaryBoucek accompanied by Ron Joseph met with Co-Op Mine officials on June 14, 1983, to assess raptor powerline conflicts. Most of the powerlines examined are three-phase configurations energized with 12.8 Kv of electricity. The design is not an approved raptor safety configuration as specified in REA bulletin 61-10 or "Suggested Practices for Raptor Protection on Powerlines... The State of the Art 1981". However, the Fish and Wildlife Service (FWS) does not recommend that these lines be modified to conform with raptor protective designs because it is unlikely that eagles and hawks will perch on the crossarms. Members of both agencies examined the base and crossarm of several poles and could not observe evidence of raptor use. Two major factors contribute to the lack of raptor use on Co-op mine powerlines. The lines are located at the bottom of the canyon and are not the most elevated perch structures from which an eagle or hawk can scan the surrounding terrain. The canyon ridges are heavily wooded and offer a greater array of perch sites and hunting habitat than afforded by the powerlines.

However, on July 27, 1983, the Division wrote a letter requiring all poles be modified due to the fact that Co-Op had never responded to the Division's original requirements for pole modification or pole survey (through the Division) prior to April 30, 1982. On April 6, 1984, Division biologists and field inspectors met to discuss resolution of this problem, i.e. whether or not Co-Op should indeed be required to modify power poles in Bear Canyon. At this meeting it was decided that the Division will adopt USFWS recommendations that power poles not be modified and thus, negate the July 27, 1983 requirement for all poles to be modified. It should be emphasized, however, that all new power poles or existing poles which are replaced must be constructed according to REA Bulletin 61-10 or "Suggested Practices for Raptor Protection on Powerlines... The State of the Art (1981)." Co-Op must make the commitment in the Bear Canyon MRP, as previously noted on p.19 (UMC 817.97 (c)) of the March, 1984 DOC/Technical Deficiency document. It should also be noted that if raptor use of the Bear Canyon area increases in the future to the point where the regulatory authorities determine that a problem exists with the power poles, Co-Op will at that time be required to modify any existing poles deemed a hazard to raptors by the regulatory authority.

In regards to the DOC/Technical Deficiency document, March 1984, the Division is amending certain informational requirements as listed on page 19 of the document, under UMC 817.97(a), as follows:

1. 2nd paragraph - There is no need to supply the June 1982 USFWS raptor survey in the MRP. Information from UDWR contained in chapter 10 of the MRP summarizes both 1981 and 1982 USFWS data as well as 1983 DWR data and is sufficient for permitting purposes.

Mr. Wendell Owen
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2. 3rd paragraph - There is no need to provide a new map delineating raptor survey results. The map currently appearing in Appendix 10 is adequate for permitting purposes. Therefore, this paragraph is expunged.

Should you have any questions, please do not hesitate to contact Steve Cox or Mary Boucek of the Division.

Sincerely,

Mary M. Boucek
Mary M. Boucek
Reclamation Biologist/
Permit Supervisor

MMB/jvb
83900

cc: Joe Helfrich, DOGM
Ken Wyatt, DOGM
Steve Cox, DOGM
Lynn Kunzler, DOGM
Ev Hooper, DOGM

CHAPTER 11

CLIMATOLOGY AND AIR QUALITY

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CHAPTER 11

CLIMATOLOGY AND AIR QUALITY

11.1 SCOPE

This chapter describes general climatology and air quality of the Co-op Mining Company Permit area and the effects of mining on ambient air quality. Fugitive dust emission sources are identified, and an estimate of uncontrolled emissions is made. Existing and proposed controls are discussed along with an estimate of controlled emissions. A precipitation and wind monitoring plan is briefly described.

11.2 METHODOLOGY

The climatological data obtained from the U.S. Weather Bureau at Hiawatha, Utah, were incorporated with the data from the Hydrologic Atlas of Utah (Jepson et. al, 1968). Wind information was gathered by personal communication with the Utah State climatologist. Uncontrolled fugitive dust emissions were estimated by using emission factors provided by the Environmental Protection Agency at Denver, Colorado. The best available control technology (BACT) was used to estimate the total emissions.

11.3 EXISTING ENVIRONMENT

The climate of the Bear Canyon Mine area is typical of subalpine areas in the central region of Utah. In general, the summer season is short with maximum temperature reading ($^{\circ}\text{F}$) in the 80's and minimum readings in the 40's. Fall and spring seasons are erratic in nature with snow precipitation occurring as early as September and as late as the first part of June. Winters in this subalpine area are often severe, with recorded temperatures of -20°F or below at times. Major snowfalls occur in the months of December, January, and February. Snow frequently remains on the ground from November until April in depths varying up to 6 ft. Winds are generally light to moderate with average speeds below 20 m.p.h. The prevailing wind direction within the general area of the mine site is from the southwest. Winds are generally parallel to the canyons except during storm periods. Wind speed varies from canyon to canyon.

Estimated annual average background total suspended particulate (TSP) in rural, central Utah is approximately $20 \text{ ug}/\text{m}^3$ (AeroVironment, 1977). Because of the proximity to the existing mine, background TSP could be higher than the average background total

for typical rural areas.

11.3.1 Precipitation

Precipitation varies greatly in the vicinity of the Plateau Mining permit area due to the Manti-LaSal Mountain Range. Local factors affecting precipitation in the lease area are altitude, topography, and geographic location relative to the west-to-east storm track. The normal annual precipitation at the center of the permit area is approximately 8 in to 10 in greater than it is near the office area.

The nearest weather monitoring station is at Hiawatha, located about 5 mi northeast from the center of the permit area. The annual precipitation recorded at Hiawatha station is 13.18 in. Table 11-1 shows the precipitations recorded from 1916 to 1975. An isohyetal map from the Hydrologic Atlas of Utah shows an annual precipitation of 22 in. at the center of the permit area. (This is the source of the discrepancy referenced in the OSM completeness determination.) Approximately 16 in. or 73% of this precipitation occurs as snow from October to April. The other 6 in. or 27% occurs from May to September as rainfall. Snow accumulation averages 4.5 ft; a maximum snow depth of 6 ft is to be expected.

TABLE 11-1

Precipitation Totals
(inches)

Month	Mean	Greatest Daily	Year	Snow		
				Mean	Maximum Monthly	Year
Jan	.87	.92	1944	21.3	59.0	1969
Feb	.98	1.29	1923	12.8	47.0	1969
Mar	.99	1.20	1935	9.7	39.5	1952
Apr	.91	1.33	1944	4.0	22.0	1965
May	1.05	2.00	1922	2.0	25.0	1964
Jun	1.04	2.14	1941	.2	1.0	1925
Jul	1.22	1.20	1973	.0	.0	-
Aug	1.92	2.05	1946	.0	.0	-
Sep	1.26	1.73	1961	4.2	11.0	1965
Oct	1.20	1.54	1941	1.3	14.0	1961
Nov	.73	1.35	1943	6.6	30.5	1951
Dec	1.01	1.53	1916	13.0	50.5	1951
Annual	13.18	2.14	Jun 1941	74.5	59.0	Jan 1969

Station: Hiawatha Longitude: 110° 01'
Elevation: 7,220 Latitude: 39° 29'
Period of Record: 1916-1975

11.3.2 Temperature

Temperature is seasonally variable and highly influenced by elevation. January temperatures vary from a mean minimum of approximately 13°F to a mean maximum of approximately 30°F. July temperatures vary from a mean minimum of 54°F to a mean maximum of 82°F (Jeppsen et al., 1968). Similar temperature ranges are recorded at Hiawatha Station. Table 11-2 shows the temperatures recorded between 1922 and 1975. The average annual temperature is 45°F. July is the warmest month (average 69°F) and January, the coldest (average 23°F). Wide daily temperature ranges are caused by relatively strong daytime warming and rapid nighttime cooling.

11.3.3/11.3.4 Evaporation and Relative Humidity

Potential evaporation is about 40 in/yr. Transpiration is less than 18 in/yr. Relative humidity ranges from a summer average of 45% to a winter average of 85%.

11.3.5 Wind Direction and Velocity

TABLE 11-2

Temperatures

Month	Means			Extremes			
	Daily Maximum	Daily Minimum	Monthly	Record Highest	Year	Record Lowest	Year
Jan	32.2	13.5	22.9	59	1971	-16	1971
Feb	36.2	17.4	26.8	59	1971	-18	1933
Mar	43.9	22.7	33.9	68	1966	-10	1964
Apr	54.5	31.1	42.9	80	1928	7	1975
May	64.8	39.9	52.3	86	1936	18	1965
Jun	74.7	48.9	61.7	93	1961	26	1943
Jul	82.0	56.2	69.1	95	1931	35	1968
Aug	79.0	54.5	65.4	93	1940	33	1968
Sep	71.3	46.6	59.0	92	1934	19	1965
Oct	59.0	36.6	47.8	78	1933	10	1972
Nov	43.5	24.1	33.8	63	1975	-2	1931
Dec	34.4	16.1	25.0	58	1959	-12	1924
Annual	56.3	34.0	45.1	95	Jul 1931	-18	Feb 1933

Station: Hiawatha Longitude: 110° 01'
 Elevation: 7,220 Latitude: 39° 29'
 Period of Record: 1922-1975

In general winds are light to moderate, with average speeds below 20 mph*. Wind speed varies from canyon to canyon. At the Bear Canyon Portal area, the average wind speed is estimated at 10 mph, directed from west-southwest. Tornadoes are very rare, but strong winds may occur, particularly in these mountain passes and canyons. The highest gust in the vicinity of the mine site is expected to be more than 100 mph. The gust would occur under extremely unstable conditions with active fronts.

11.3.6 Air Quality

The permit area has been designated a Class II area for purposes of prevention of significant air quality deterioration. Particulates are the only pollutant that would contribute to air pollution as a result of mining activities. Increases in other pollutants such as sulfur dioxide, nitrogen oxides, carbon monoxide, and photochemical oxidants would be negligible.

An annual average background level for total sus-

*Arlo Richardson, Utah State climatologist at Utah State University

pended particulates (TSP) in rural, central Utah areas of 20 micrograms per cubic meter (ug/m^3) has been estimated (AeroVironment, 1977) This is a significantly below the Federal secondary standard of $60 \text{ ug}/\text{m}^3$. Because of proximity to existing mines, background TSP levels at the site would be expected to be higher than average for rural areas. The short term (24 hours) National Ambient Air Quality Standard (NAAQS) can be exceeded in rural Utah as a result of windblown dust. TSP data from three near-by monitoring stations are shown on Table 11-3. The background visual range was estimated to be 37 mi (60km) based on the background TSP estimate (AeroVironment, 1977).

11.4 EFFECTS OF THE MINING OPERATION ON AIR QUALITY

11.4.1 Estimate of Uncontrolled Emissions

The following sources of dust emissions have been identified: (1) topsoil removal and storage, (2) access road, and (3) coal handling facilities. Table 11-4 shows an uncontrolled emission factor for each process operation. A total of 69.01 ton/yr of uncontrolled emissions is estimated from the mining activities at the maximum coal production rate of 400,000 ton/yr.

TABLE 11-3

TSP Readings at Stations Near the Lease Area

Location	Period of Observation	Maximum ¹ 24-Hour Average	AGM ² (ug/m ³)
Price	6/75 - 12/75	181	72
Huntington Canyon	1975	191	22
Bear Creek Canyon	1974	222	21

¹National Ambient Air Quality Standards for maximum 24-Hour particulate concentrations are 150 mg/m³ and 260 ug/m³ for the secondary and primary standards, respectively.

²National Ambient Air Quality Standard for the annual geometric mean (AGM) is 60 ug/m³ for the primary standard.

Source: Adapted from Table II-13 on page II-37 of the Draft Environmental Statement Development of Coal Resources in Central Utah, prepared by the U.S. Department of the Interior.

Table 11-4

Co-op Mining Company - Dust Control (Bear Canyon)

	<u>Uncontrolled</u>		<u>Factor</u>	<u>Controlled</u>	
Haul Roads	23.17 T. per year		85%	3.476 T. Per Year	
Access Roads	3.59	"	85%	.54	"
Coal Storage	5.25	"	50%	2.625	"
Conveyors	20.	"	99%	.2	"
Crusher	.2.	"	99%	.02	"
Screens	10.	"	99%	.1	"
Product Removal	<u>5.</u>	"	50%	<u>2.5</u>	"
TOTAL	69.01	"		9.461	"

11.4.2 Description of Control Measures - Fugitive Dust Control Plan

The following subsections describe in detail the fugitive dust control measures that are in effect or are planned for the mine plan for each of the listed sources.

Topsoil removal and Storage Pile

The operator currently implements a water spray program during operations involving topsoil removal and stockpiling. Revegetation of stockpile areas is initiated after topsoil has been replaced.

Access Roads

To determine control measures most appropriate in the suppression of access road fugitive dust.

Frequently Used Access Roads

The roads leading to material supply and storage areas and the connecting road from the Bear Canyon Portal area to the coal loading area will experience

frequent use. If necessary, a soil stabilizing agent would be worked into the upper layer of the roadbed. A road grader would be used periodically to remove accumulations of spilled materials from the roadbeds. Vehicular speed would be limited to a maximum of 30 mph. Periodically, or as necessary during the operating life of the mine, the roads may be treated with water and/or nontoxic dust suppressants.

Coal-Handling Facilities

Principal sources of fugitive dust emissions related to the coalhandling facilities have been identified as (1) conveyor, (2) crusher building, and (3) coal storage. The proposed control measures for each of these sources are discussed individually below.

Conveyors

Conveyors, housing the main belts from the mine portals to the run of mine coal intermediate stockpile, will be covered. Transfer points in the raw coal/crusher area will contain water sprays or other dust control methods as applicable. The conveyor discharge height will be minimized.

Crusher Building

The primary crushers will be enclosed and will contain water sprays or other control measures as applicable. Crushed coal would be transported to the storage area conveyor.

Coal Storage Pile

The coal storage pile would be periodically sprayed with water and/or nontoxic dust suppressants. The orientation of the coal pile is placed in such an area to protect from the prevailing wind direction to minimize the wind erosion.

11.4.3 Estimate of Controlled Emissions

Emissions have been estimated for the maximum projected coal production of 400,000 ton/yr. The major portion of this coal will be transported via conveyor.

Based on the control practice outlined in the EPA Region VIII Interim Policy paper on the Air Quality Review of Surface Mining Operation, the estimated total controlled emission is estimated at approxi-

mately 9.461 ton/yr. Table 11-5 shows the estimated emissions by applying BACT to the uncontrolled emission estimates of Table 11-4.

11.4.4 Estimated Cost of Emission Control

The estimated cost of emission control consists of equipment capital cost and operating cost. Equipment capital cost includes installed cost for water spray equipment, enclosures, telescoping chutes, and conveyor cover. The operating cost includes direct costs of utilities, maintenance, and operating labor for chemical dust suppressants.

The existing emission controls are covers for conveyor, silo and stacking tube, and treated coal haul road. The conveyor cover was installed at \$15,000 and the stacking tube cover cost about \$4,000. A water-spray truck cost about \$20,000.

The operating cost for soil stabilization depends on the kind of product used as dust suppressant. The manufacturer estimates that treatment cost varies from \$300 to \$1,000 per acre depending on the size of the project, rate of dilution, and distance from the source of supply. For the Co-op Mining lease

Table 11-5

Co-op Mining Company - Dust Control (Bear Canyon)

Storage Pile (Coal)

Average size of pile 5,000 T. (10,000 T. Cap. - Normally less than 1,000 T.)

Through Put 200,000 T. Per Year

D= 9.125

s= 20

d= 175 (Hiawatha weather station -151 days snow cover--39 Additional Days .01 In. or more of Rainfall)

$$e = .05 \frac{20}{1.5} \frac{175}{235} \frac{15}{15} \frac{9.125}{90} = .0525 \text{ } 200,000 \text{ T.} = 5.25 \text{ T. Per Year}$$

Control- Coal is sprayed with water as it is being mined in order to meet underground Dust Control requirements. Additional Spray Equipment will be installed at the Storage Site to use if needed.

Crushing (Primary Only) 200,000 T. . . .02 = 4,000# =2 T. Per Year

Control - Enclosed and Vent to Bag house or water sprays

Screening 200,000 T. . . .1 = 20,00# - 10 T. Per Year

Control- Bag house or Water sprays

Conveyors and Transfer points 200,000 T. . . .2=40,000# =20 T. Per Year

Control - Enclosed and Vent to Bag house or water sprays

Roads (Haul) - s = 15
S = 20
W = 190

$$E = 5 \cdot .47945 = 2.39725 @ 19333.33 \text{ Miles per year} = 23.17 \text{ T. per year}$$

Control --Chemical Stabilization or Water Spray

Table 11-5 cont.

Roads (Access) s=15
S=10
W=190

E = 2.5 . .479452 = 1.986 2 6000 Miles per year
3.59 T. Per year

Control -- Chemical Stabilization or Water Spray

Product removal 200,000 T. Per Year . .05 = 5 T. Per Year

Control - Water Spray

area, the application of a product such as Coherex from May to October would cost about \$5,000.

Therefore, \$39,000 is estimated for capital cost, and \$5,000 is estimated for annual operating cost for emission control.

11.5 CLIMATOLOGICAL AND AIR QUALITY MONITORING*

The annual precipitation within the lease area ranges from 13 in near the mine office to 15 in at the center of the lease area. Since the precipitation varies significantly within the lease area, the Co-op Mining Company is planning to install a precipitation gauge and will monitor it routinely. The monitoring result will be reported to USGS and USFS.

Air quality is being monitored at the lease area by U.P. & L. through Utah State University. Particulates are the only pollutant that might impact air quality at the mine area. Increases in concentrations of other pollutants such as sulfur dioxide, nitrogen oxide, carbon monoxide, and photochemical oxidants would be negligible. The main source of TSP would be coal particles which would settle out within short distances (one mile or less) downwind.

The mining operation would not be a "major source" under the prevention of significant deterioration (PSD) regulations because total annual controlled emissions of particulate matter are expected to be less than 250 ton/yr. Therefore, the requirement for a PSD permit and for air quality monitoring is not anticipated, bases on the July 7, 1980 PSD Regulation 40CFR, Parts 51, 52, 53, and 124.

*Subsections 11.5.1, 11.5.2, and 11.5.3 are addressed within the content of this section.

11.6 BIBLIOGRAPHY

AeroVironment, Inc., 1977, Assemblage of data on air quality in central and southern Utah and assessing the impact of coal development in this region on the air quality: Pasadena, Ca., Final Report.

Environmental Protection Agency (EPA), 1978, Memorandum 8EA: Denver, Co., U.S. EPA Region VIII.

Jeppson, R.W., Ashcroft, G.L., Huber, A.L., Skogerboe, G.V., and Bagley, J.M., 1968. Hydrologic Atlas of Utah. Utah Water Research Laboratory and State of Utah Department of Natural Resources. PRWG35-1. Utah State University. Logan, Utah.

Richardson, Arlo, Utah State Climatologist, Utah State University, Logan, Utah, in a personal communication in December 1980.

Chapter 11

Appendix

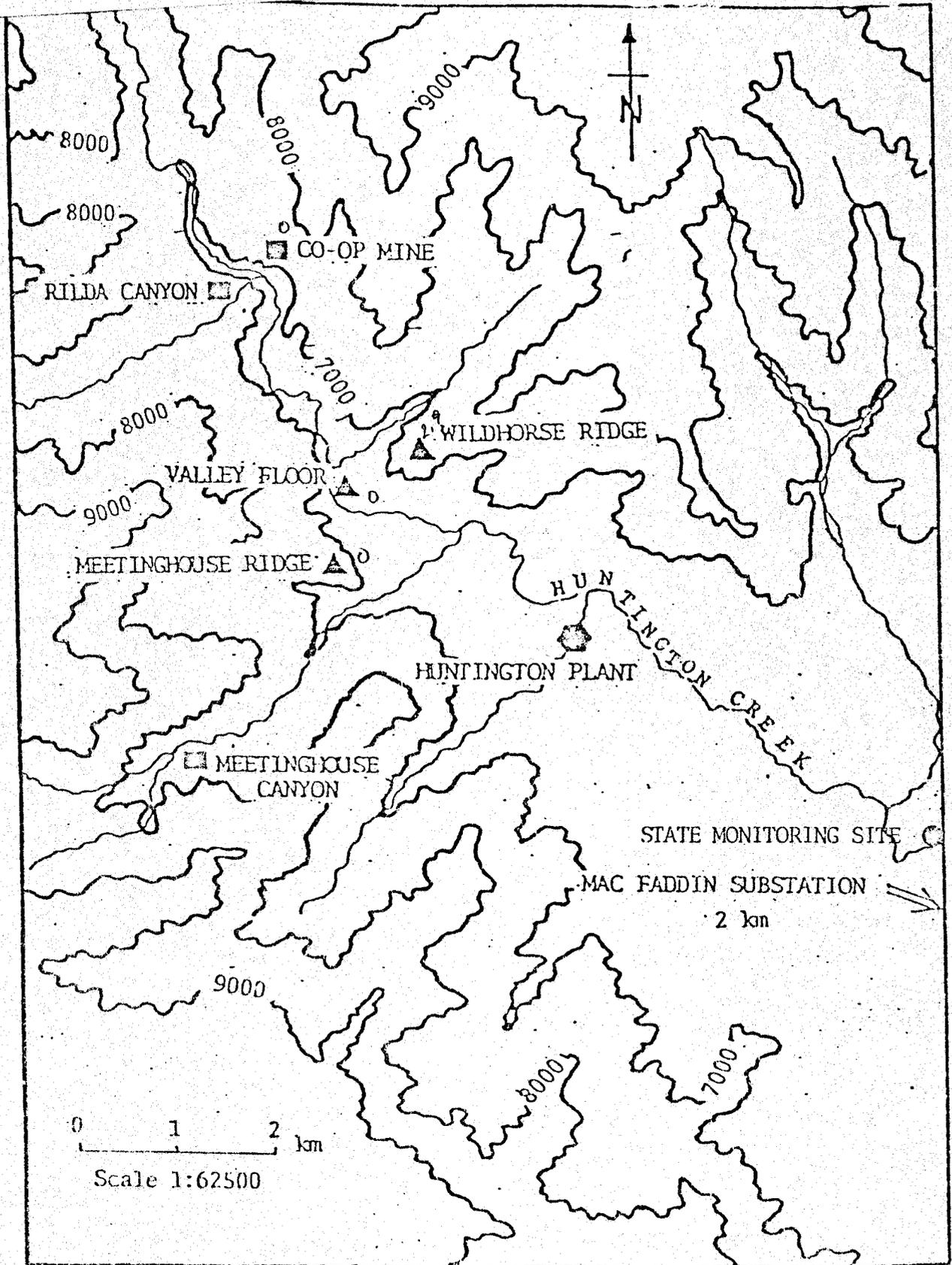
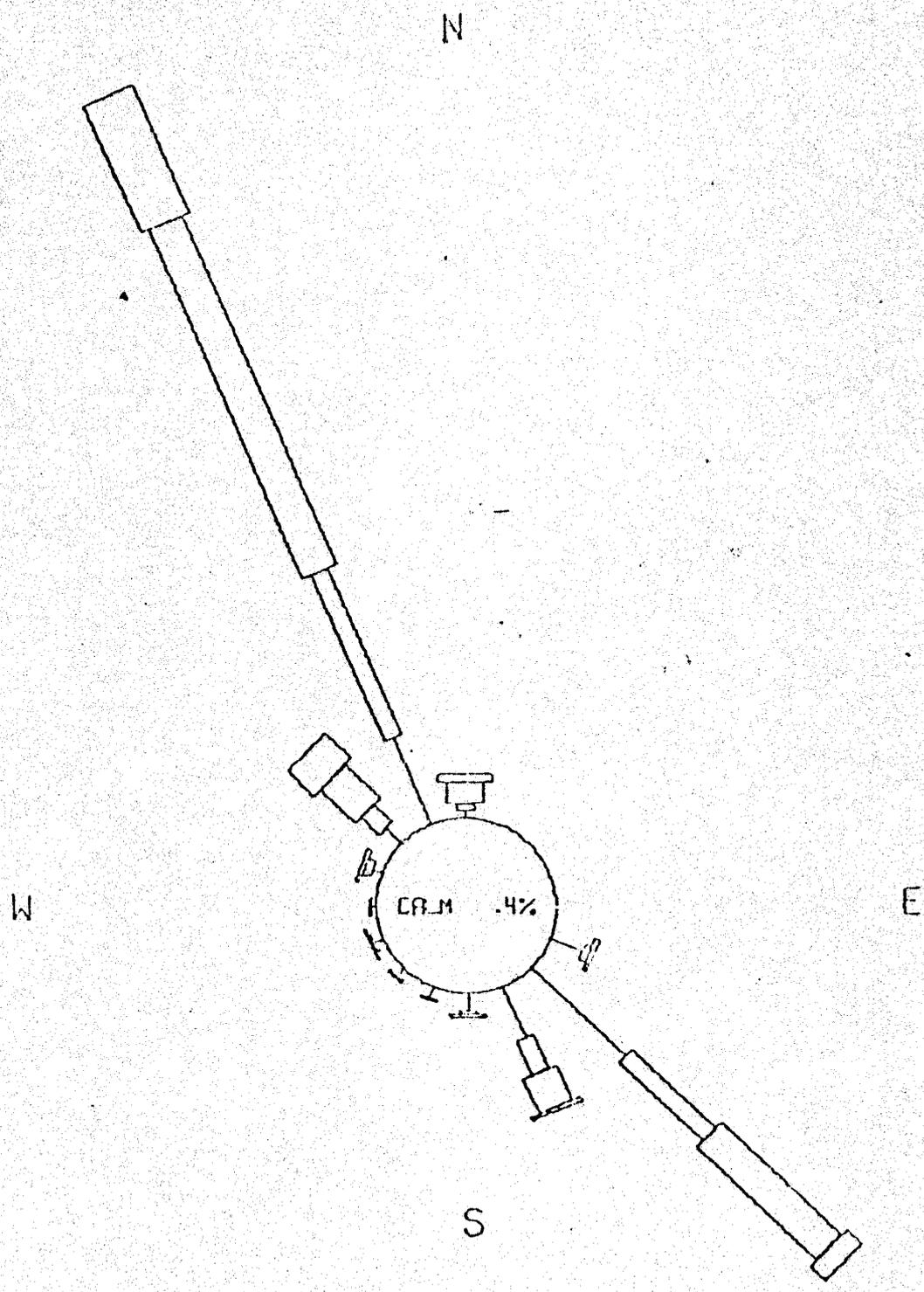


Figure 1.1 Map of Huntington Canyon, Utah, and the location of the plant site and air quality monitors.



0 10 20
PERCENTAGE OF OCCURRENCE

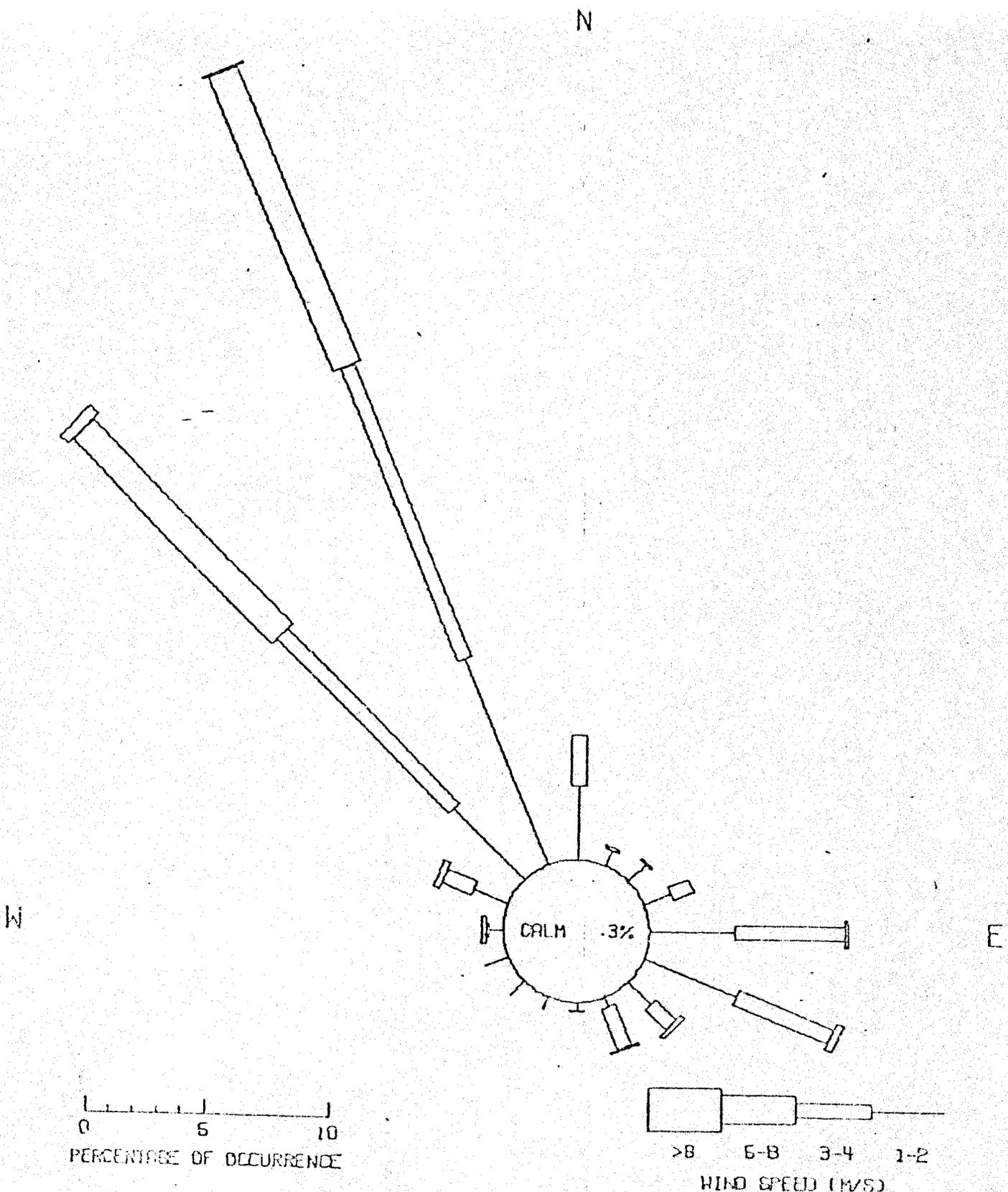
>8 6-8 3-4 1-2
WIND SPEED (M/S)

WILD HORSE RIDGE

OCT 1977 THROUGH APRIL 1978

ALL TIMES

FIGURE 4.3

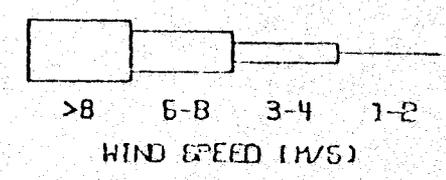
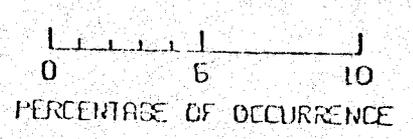
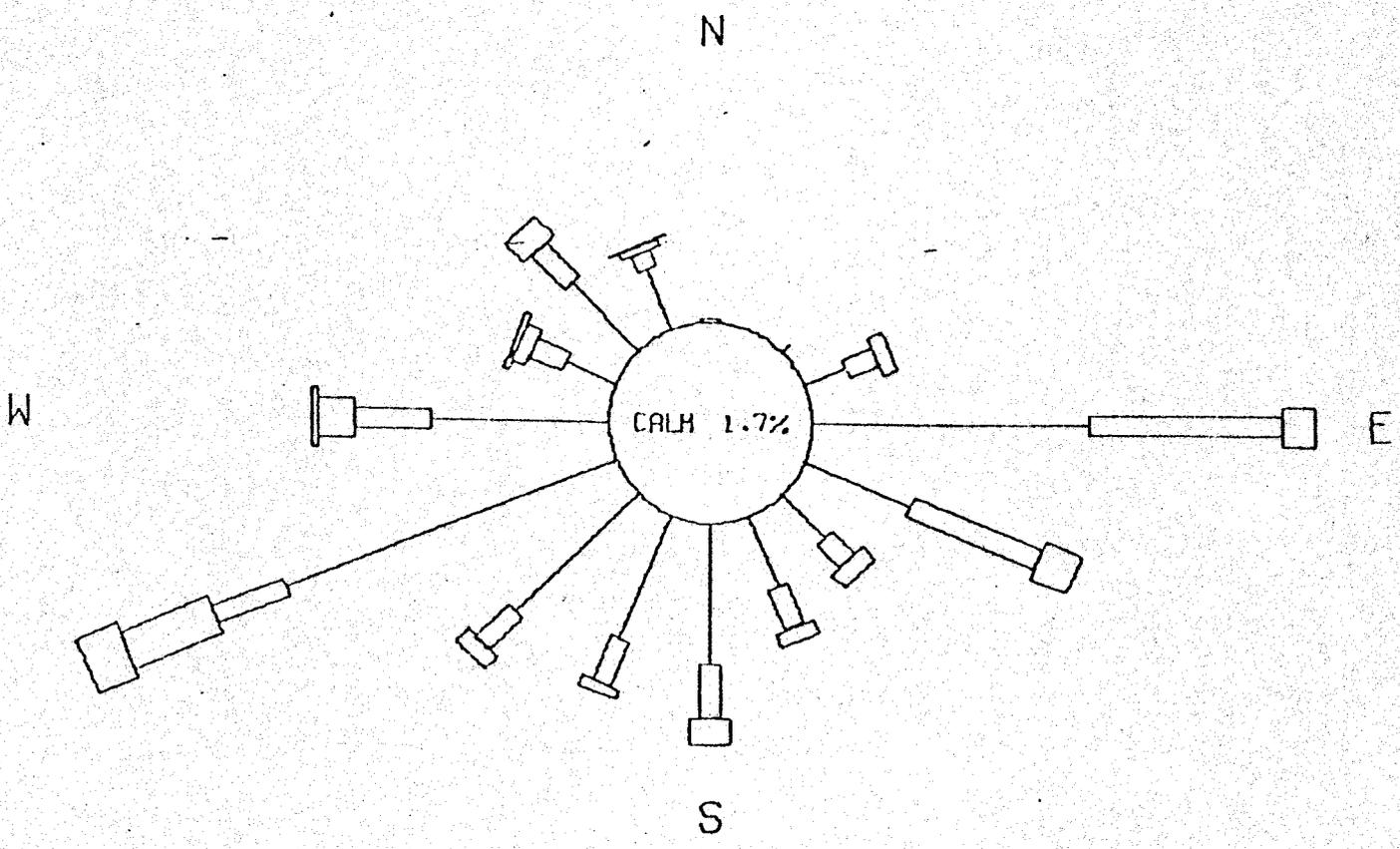


VALLEY FLOOR

OCT 1977 THROUGH APRIL 1978

ALL TIMES

FIGURE 4.4

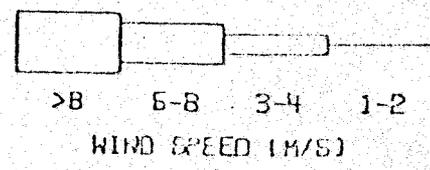
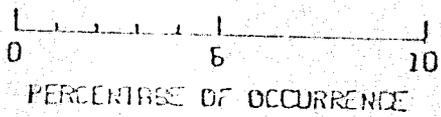
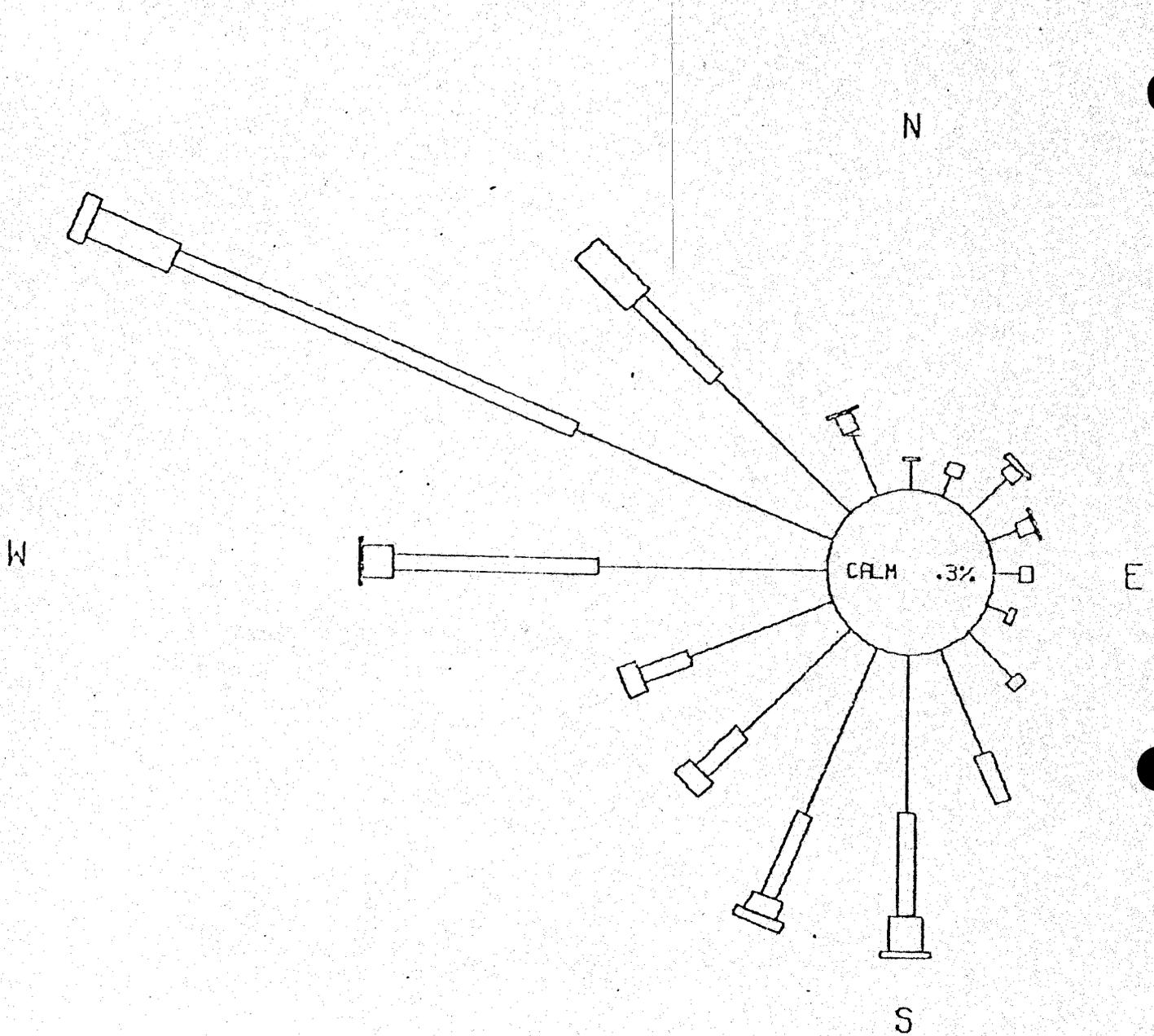


MEETING HOUSE

OCT 1977 THROUGH APRIL 1978

ALL TIMES

FIGURE 4.5

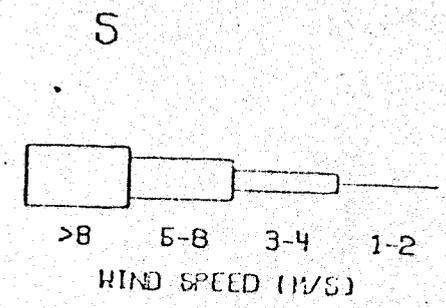
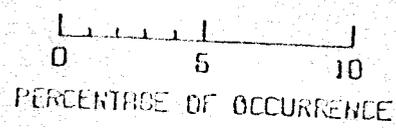
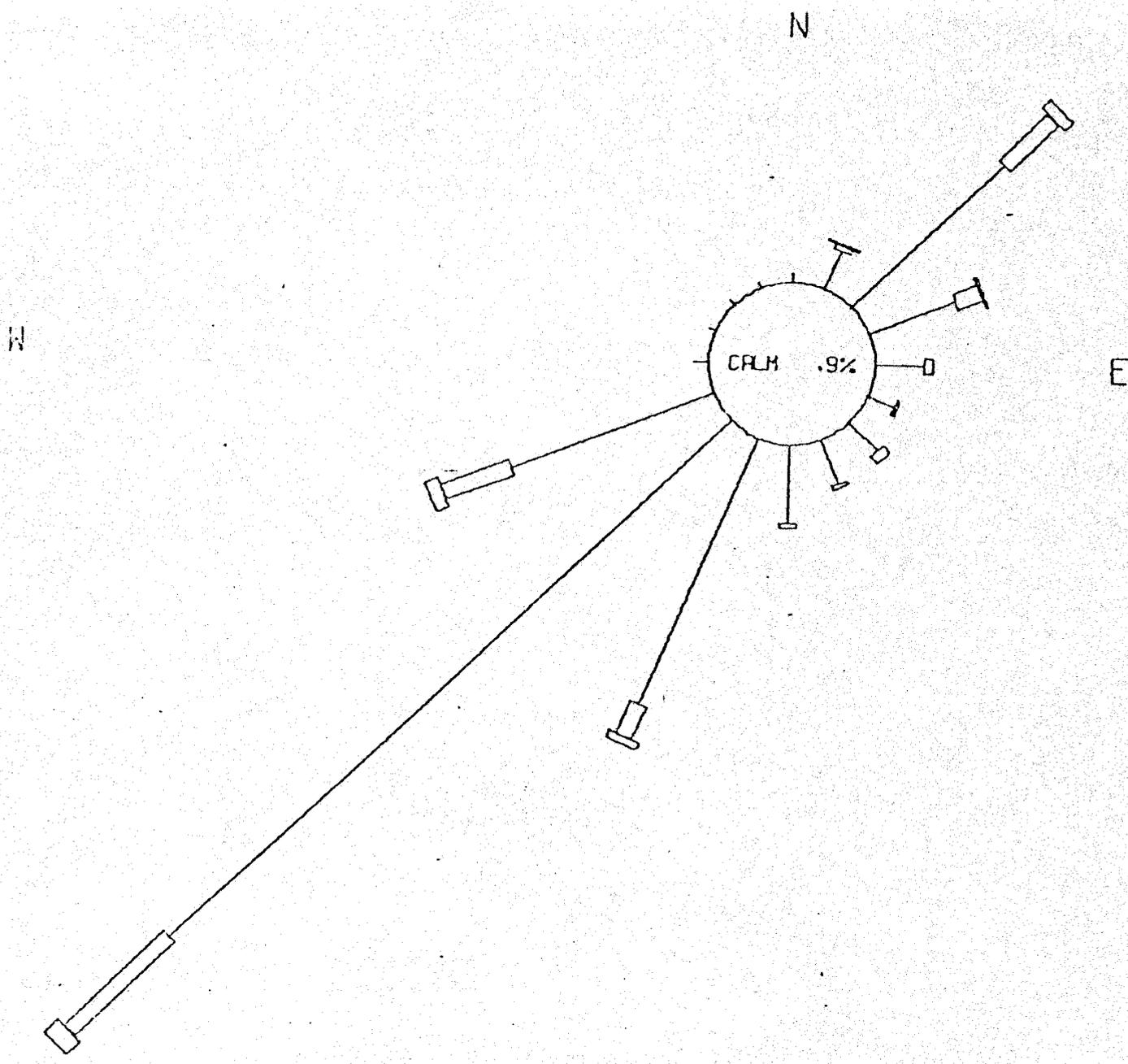


MACFADDIN

DEC 1977 THROUGH APRIL 1978

ALL TIMES

FIGURE 4.6

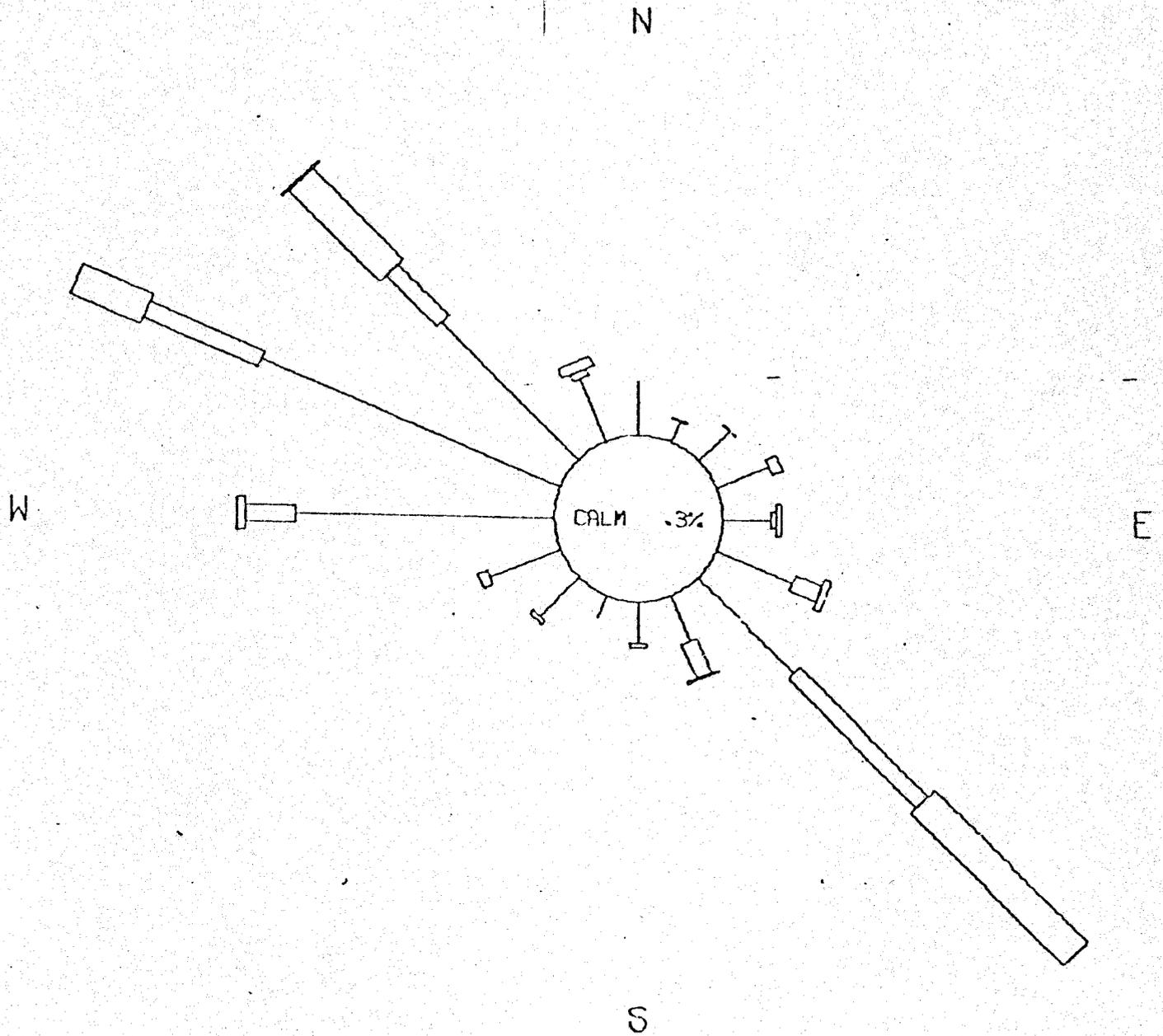


RILDA CANYON

DEC 1977 THROUGH APRIL 1978

ALL TIMES

FIGURE 4.8



CO-OP MINE

OCT 1977 THROUGH APRIL 1978

ALL TIMES

FIGURE 4.9

Letters of Approval

Chapter 11

APPROVALS

Scott M. Matheson
Governor



STATE OF UTAH
DEPARTMENT OF HEALTH
DIVISION OF ENVIRONMENTAL HEALTH
150 West North Temple, P.O. Box 2500, Salt Lake City, Utah 84110-2500

Kenneth Lee Alkema, Director
Room 474 801-533-6121

December 20, 1983
533-6108

James O. Mason, M.D., Dr.P.H.
Executive Director
801-533-6111

||
DIVISIONS

Community Health Services
Environmental Health
Family Health Services
Health Care Financing

||
OFFICES

Administrative Services
Community Health Nursing
Management Planning
Medical Examiner
State Health Laboratory

Wendell Owen
Co-Op Mining Company
P. O. Box 300
Huntington, Utah 84528

RE: Approval Order for Modifications
to Air Pollution Control at Coal
Mine, Emery County

Dear Mr. Owen:

On October 28, 1983, the Executive Secretary published a notice of intent to approve the modifications to the air pollution control equipment for the surface operations at your coal mine in Emery County. The 30 day public comment period has expired, and no comments were received.

This air quality approval order authorizes the modifications as proposed in your notice of intent dated October 14, 1983, with the following operating conditions:

1. All emission control equipment shall be properly installed, maintained, and operated as proposed in the notice of intent dated May 5, 1980, and subsequent information dated October 14, 1983.
2. No visible emissions from any point shall exceed 20% opacity as measured by EPA test Method 9.
3. Annual production of coal shall not exceed 200,000 tons without prior approval from the Executive Secretary in accordance with Section 3.1, UACR.
4. Crushers, screens, conveyors, and all transfer points shall be controlled by water sprays to minimize fugitive emissions. The water sprays shall operate whenever the mine is operating.
5. The haul roads and access roads shall be water sprayed to minimize fugitive dusts at least twice per eight hour shift unless daily precipitation exceeds 0.05 inches for that day.

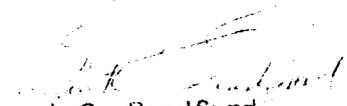
Wendell Owen
December 20, 1983
Page 2

6. The stockpile and loadout areas shall be sprayed (water or other suppressant) as dry conditions warrant or as determined necessary by the Executive Secretary.

7. A compliance inspection shall be performed within 30 days of the date of this approval order.

The fee for issuing this modified approval order is \$179.17. (See enclosures for breakdown of costs.) The amount is payable to the Utah Department of Health, sent to the Executive Secretary of the Utah Air Conservation Committee, and is due within 30 days after the approval order date.

Sincerely,


Brent C. Bradford
Executive Secretary
Utah Air Conservation Committee

MRK/ads
cc: EPA Region VIII (J. Philbrook)
Southeastern District Health Dept.
Enclosures (2)

4367

ITEMIZED COSTS FOR NOTICE OF INTENT

The following are final costs incurred by the Bureau of Air Quality to review your modification and issue an approval order.

Filing Fee	\$ 50.00
Engineering Review	77.40
Administrative	<u>51.77</u>
Total	\$ <u>179.17</u>

CHARGEABLE FEES - BUREAU OF AIR QUALITY

Source CO-OP Mining Major _____ Minor X
 Date Started _____ Non-Attainment _____ PSD X
 Date Approved _____

NOTICE OF INTENT REVIEW

1. Pre-Design Date: 0 1. Engineer/Hours _____
 Engineer/Hours 0
 Filing Date: 10/14/83 2. \$ 50.00

Engineering Review: Engineer/Date/Hours _____

Site Survey Date: 10-21 4HR _____

Calculations: _____

_____ Hours/Engineer \$ _____

_____ Hours/Engineer \$ _____

TOTALS: 44hrs @ \$15/HR = 60 Hours with 29% fringe \$ 77.40

2. Modeling: TOTALS: Hours/Modeler 0

Calculations: Computer \$ 0

Analysis \$ 0

3. Administrative Costs:

Survey Travel \$ 0

Notice to Paper \$ 46.35

Hearing Travel \$ 0

Overhead @ 7% \$ 5.42 ($.07 \times 77.40$)

SUBTOTALS \$ 51.77

FINAL TOTALS 4 HOURS \$ 179.17 ($50.00 + 77.40 + 51.77$)



STATE OF UTAH
NATURAL RESOURCES
Oil, Gas & Mining

Scott M. Matheson, Governor
Temple A. Reynolds, Executive Director
Dr. G. A. (Jim) Shirazi, Division Director

4241 State Office Building • Salt Lake City, UT 84114 • 801 533 5771

August 17, 1983

Mr. Wendell J. Owen
Co-op Mining Company
P. O. Box 1245
Huntington, Utah 84528

RE: Approval for Consolidation of
Topsoil Stockpiles
Bear Creek Canyon Mine
ACT/015/025, Folder Nos. 4 & 7
Emery County, Utah

Dear Mr. Owen:

Following is the approval of the proposed plan for consolidation of the several topsoil stockpiles located at Bear Canyon. The approval lists the deadlines for completing the work and a change in the recommended seed mix.

Please be aware that failure to meet these deadlines will subject Co-op to a violation for failure to operate in accordance with an approved plan.

Division approval is hereby granted to consolidate the topsoil piles in Bear Creek Canyon and provide accurate topsoil volume calculations by August 31, 1983 as proposed in Co-op Mining Company's June 24, 1983 submittal. Approval to implement protection measures of topsoil stockpiles is granted with the exception of utilizing the seed mix proposed. The use of the seed mix listed in Attachment 2-A is not recommended for topsoil pile protection as the shrubs included, given 20-40 years of growth, would in all likelihood cause problems in the topsoil redistribution process. It is suggested that Co-op utilize an appropriate seed mix for topsoil protection which does not contain shrubs.

Since fall seeding would produce the most optimal success in germination and establishment of a vegetative cover, seeding may occur as late as October 14, 1983.



STATE OF UTAH
NATURAL RESOURCES
Oil, Gas & Mining

4241 State Office Building • Salt Lake City, UT 84114 • 801-533-5771

Scott M. Matheson, Governor
Temple A. Reynolds, Executive Director
Dr. G. A. (Jim) Shirazi, Division Director

September 12, 1983

Mr. Wendell Owen
Co-op Mining Company
P. O. Box 1245
Huntington, Utah 84528

RE: Completeness Determination
For NOV N83-5-2-2, #2
Bear Creek Canyon Mine
ACT/015/025
Folder Nos. 3 and 7
Emery County, Utah

Dear Wendell:

The hydrologic staff has reviewed the material pertaining to NOV 83-5-2-2, #2 in your August 25, 1983 submittal. We have determined the material to be adequate and in compliance with UCA 40-10-18(1), UMC 817.43(a), (b), (c) and UMC 817.45(i).

We are still awaiting for information to process NOV N83-5-5-3, #2 and NOV 83-5-8-3.

If we can be of further assistance, please contact us anytime.

Sincerely,

DAVID W. DARBY
RECLAMATION HYDROLOGIST

DWD/btb

cc: J. Helfrich, DOGM
J. Whitehead, DOGM

Received Sept. 14, 1983
Called Darby to see what
he was lacking as we were
told at the Sept. 2nd
meeting we had everything
in and they were
reviewing it. WJO



STATE OF UTAH
NATURAL RESOURCES
Oil, Gas & Mining

Scott M. Matheson, Governor
Temple A. Reynolds, Executive Director
Dr. G. A. (Jim) Shirazi, Division Director

4241 State Office Building • Salt Lake City, UT 84114 • 801-533-5771

September 29, 1983

Mr. Wendell Owen
Co-op Mining Company
P. O. Box 1245
Huntington, Utah 84528

RE: Completeness Determination for
Notice of Violations N83-5-5-3, #2
and N83-5-8-3, #3
Bear Creek Canyon Mine
ACT/015/025, Folder Nos. 3 & 7
Emery County, Utah

Dear Mr. Owen:

The Division of Oil, Gas and Mining staff has reviewed your recent submittal addressing the abatement of Notice of Violation's (NOV) N83-5-5-3, #2 (drainage on scalehouse area) and N83-5-8-3, #3 (drainage on upper storage pad). We have determined the material to be adequate and in compliance with Utah Code Annotated (UCA) 40-10-17(e) and UMC 817.23 for N83-5-5-3, #2 and UCA 40-10-18(2)(i) and UMC 817.43-.45 for N83-5-8-3, #3.

Approval is hereby granted to continue operations in these described areas in accordance with practices and procedures established in UCA 1953, Title 40-8 and regulations pertaining to surface effects of underground mining activities (UMC 700 through 944) promulgated under Title 40-10-1, UCA 1979.

For any further assistance, please contact us anytime.

Sincerely,

JAMES W. SMITH, JR.
COORDINATOR OF MINED
LAND DEVELOPMENT

JWS/DWD:btb

cc: J. Helfrich, DOGM
J. Whitehead, DOGM
D. Darby, DOGM



STATE OF UTAH
NATURAL RESOURCES
Oil, Gas & Mining

4241 State Office Building • Salt Lake City, UT 84114 • 801-533-5771

Scott M. Matheson, Governor
Temple A. Reynolds, Executive Director
Dr. G. A. (Jim) Shirazi, Division Director

October 4, 1983

#P396 996 891
CERTIFIED RETURN RECEIPT REQUESTED

Mr. Wendell Owen
Co-op Mining Company
P. O. Box 1245
Huntington, Utah 84528

RE: Interim Revegetation
Trail Canyon Mine
ACT/015/021, Folder No. 4
Bear Creek Canyon Mine
ACT/015/025, Folder No. 4
Carbon County, Utah

Dear Mr. Owen:

The Division hereby grants approval for Co-op Mining Company to implement the interim revegetation plan for the Bear Creek Canyon Mine that was submitted to the Division on September 28, 1983.

Per your verbal request to seed the 4/10 acre of the noncoal waste storage area in Trail Canyon according to the reclamation plan submitted to the Division on April 18, 1983, the Division hereby grants conditional approval as follows:

Condition #1

Should analysis and testing confirm PCB contamination of this area, Co-op Mining Company will comply with whatever remedial action is required by the Division to clean-up the PCB's, even to the extent of redistributing the area and reclaiming it a second time.

Condition #2

All runoff from this area must pass through an approved sediment control structure until such time as adequate vegetation has been established and the Division approves the discontinuance of this practice.



STATE OF UTAH
NATURAL RESOURCES
Oil, Gas & Mining

Scott M. Matheson, Governor
Temple A. Reynolds, Executive Director
Dr. G. A. (Jim) Shirazi, Division Director

4241 State Office Building • Salt Lake City, UT 84114 • 801-533-5771

October 12, 1983

Mr. Wendell Owen
Co-op Mining Company
P. O. Box 1245
Huntington, Utah 84528

RE: Scalehouse Modification
Final Approval
Bear Creek Canyon Mine
ACT/015/025
Folder Nos. 3, 4 and 7
Emery County, Utah

Dear Mr. Owen:

The Division has reviewed all material submitted by Co-op Mining Company for the proposed scalehouse permit modification and have, to the best of our ability, found that it meets all requirements set forth under Title 40-10 UCA 1953 (Regulation of Coal Mining and Reclamation Operations), and UMC 700 et seq. (Surface Effects of Underground Coal Mining Activities).

Approval of the proposed scalehouse modification for the Bear Creek Canyon Mine permit is hereby granted and utilization of this facility may lawfully commence.

If you have any questions, please feel free to call.

Sincerely,

A handwritten signature in black ink, appearing to read 'James W. Smith, Jr.', written over a horizontal line.

JAMES W. SMITH, JR.
COORDINATOR OF MINED
LAND DEVELOPMENT

JWS/EH:btb

cc: Carl Kingston, Co-op Mining Company
R. Daniels, DOGM
E. Hooper, DOGM
J. Helfrich, DOGM
J. Whitehead, DOGM

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CHAPTER 5	Historical and Cultural Resources
CHAPTER 6	Geology
CHAPTER 7	Hydrology
CHAPTER 8	Soils
CHAPTER 9	Vegetation
CHAPTER 10	Wildlife Resources
CHAPTER 11	Climatology and Air Quality
	Letters of Approval

RECEIVED
OCT 24 1983

**DIVISION OF
OIL, GAS & MINING**