

Act/04/1002

**SOUTHERN UTAH FUEL COMPANY
MINE PLAN ADDENDUM**

VOLUME I

**Coastal States Energy Company
October 1979**

OCTOBER 1979 ADDENDUM

SOUTHERN UTAH FUEL COMPANY

MINING AND RECLAMATION PLAN



COASTAL STATES ENERGY COMPANY

NINE GREENWAY PLAZA

HOUSTON, TEXAS 77046

EXHIBITS

1. March 16, 1979, letter from Donald A. Crane, OSM, to Ron Daniels, Division of Oil, Gas, and Mining, Department of Natural Resources, Salt Lake City.
2. Exhibit 3 of the Technical Examination for Environmental Analysis, Coastal States Energy Company, April, 1975.
3. Environmental Analysis for Mining and Reclamation Plan on Federal Coal Leases SL-062583, U-062453, U-0149084, U-28297 prepared by Ralph J. Blumer, Office of the Area Mining Supervisor, Conservation Division, Administration Building, 1745 West 1700 South, Salt Lake City, Utah 84104.
4. Environmental Assessment Record/Technical Examination, Title 43 CFR Part 3041, Federal Coal Lease Sale U-28297, Branch of Environmental Assessment, B.L.M., Utah State Office, University Club Building, 136 East South Temple, Salt Lake City, Utah.
5. Environmental Assessment and Monitoring for the Southern Utah Fuel Company Mine near Salina, Utah, 1978, M. K. Botz, WESTECH, 2301 Colonial Drive, Helena, Montana 59601.
6. Environmental Monitoring Program for 1979, SUFCo Mine, Salina, Utah, Maxwell K. Botz, Hydrometrics, Helena, Montana, May 18, 1979.
7. May 19, 1979, Letter and soil analysis report from Alvin R. Southard, Certified Professional Soils Scientist, Utah State University, Logan, Utah.
8. Water Quality Analysis, No. 79-005384, Ford Chemical Laboratory, Inc., Salt Lake City, Utah, August 15, 1979.
9. Drainage Facilities and Sediment Control Plan for Southern Utah Fuel Company Mine No. 1, September 17, 1979, Merrick and Company, Denver, Colorado, including Exhibits 9-1 through 9-9.
10. Old Woman Plateau/SUFCo Mining Leases Vegetation Map, 1979.
11. Final Reclamation Contours Plan Map, September 22, 1979, Southern Utah Fuel Company.
12. Final Reclamation Cross-Sections Plan, September 22, 1979, Southern Utah Fuel Company.

Southern Utah Fuel Company
Mining and Reclamation Plan

ADDENDUM

A. INTRODUCTION

Coastal States Energy Company (the "Applicant") hereby submits this Addendum to its Southern Utah Fuel Company Mine Plan. This Addendum is intended to supplement the filed plan in order that the plan, as modified, satisfies the existing regulations of the U.S. Geological Survey, the State of Utah Division of Oil, Gas and Mining, the U.S. Forest Service, and the Office of Surface Mining, including those of the "permanent program."

Mining and Reclamation Plan - Submittal History

Coastal States Energy Company submitted the Southern Utah Fuel Company (SUFCo) mining plan to the U.S. Geological Survey on February 12, 1977, and to the State of Utah's Division of Oil, Gas and Mining on June 8, 1977. Additional information in the form of surface and coal ownership plats of Southern Utah Fuel Company's leases and the surrounding area was transmitted to the U.S. Geological Survey on April 13, 1977, pursuant to a request by Mr. Ralph J. Blumer, the evaluating federal officer. This information as submitted subsequently was referred to at that time as Addendum I.

During the review of the mining plan, both the U.S. Geological Survey (U.S.G.S.) and the U.S. Forest Service requested additional information in the form of Mr. Blumer's letter of April 26, 1977, to Coastal States Energy Company and in the U.S. Forest Service letter of July 15, 1977, to the U.S.G.S. In response to these letters, Addendum 2 to the mining plan was submitted to the federal and state agencies on September 26, 1977, and further described land usage, wildlife, vegetation and hydrology on the permit area and clarified Southern Utah Fuel Company's commitments to protect these systems and to reclaim the surface facilities area.

Coastal States Energy Company was notified in writing on June 3, 1977, by the U.S.G.S. that proposed changes to 30 CFR 211 would require the mining plan to address subsidence and hydrological monitoring. After the regulations were promulgated in November, 1977, Southern Utah Fuel Company was notified that additional plans covering subsidence and hydrology monitoring would have to be submitted before January 1, 1978. Accordingly, Southern Utah Fuel Company sent the subsidence report and monitoring data to the U.S.G.S. on December 28, 1977. Also, Coastal States Energy Company sent copies of their consultant's report (Exhibit 5) of the hydrologic monitoring study of the SUFCo mining area to the U.S.G.S. Survey.

The U.S.G.S. notified Coastal States Energy Company by letter of January 24, 1978, that the Subsidence and Hydrological Monitoring Plans required additional detail. The additional subsidence monitoring information was provided by Southern Utah Fuel Company's February 1, 1978, submittal. Due to adverse winter conditions, the additional hydrological monitoring data requirements were not determinable

at that time and plans were made to collect the data during the Spring/Summer 1978 hydrologic monitoring study.

On September 14, 1977, the State of Utah's Division of Oil, Gas and Mining granted final state approval to the mining plan subsequent to a public comment period during which no adverse comments were received by the Division.

Coastal States Energy Company requested permission from the U.S.G.S. to expand the surface facilities in a December 16, 1977, letter to Mr. Blumer. The plans were approved on December 22, 1977, by Mr. Jackson Moffit, Area Mining Supervisor, U.S.G.S.

The Environmental Assessment of the Mining and Reclamation Plan was completed by the U.S.G.S. on September 30, 1977. The Mining and Reclamation Plan was approved on February 2, 1978, and Coastal States Energy Company was so notified by Mr. Moffit in his letter dated February 3, 1978. The letter detailed the stipulation that the Subsidence and Hydrological Plan submittal was not encompassed by this approval.

Mr. Donald A. Crane, Regional Director of the Office of Surface Mining, notified Mr. Ron Daniels at the Utah Division of Oil, Gas and Mining by letter of March 16, 1979 that the Southern Utah Fuel Company mining plan was incomplete and that certain areas required additional detail to ensure operational compliance with reclamation performance standards. A copy of the letter is included in this Addendum submittal as Exhibit 1 to clarify the format and the intent of this submittal.

Coastal States Energy Company intends that this Addendum provide more than merely responses to the letter of March 16, 1979. Additional information related to Legal, Financial and Compliance requirements of Part 782 of the permanent program is included in this submittal as well as other additional information which the Applicant believes will satisfy the existing regulations of the permanent program.

GENERAL ADDITIONAL INFORMATION
1979 SUFCO MINING PLAN ADDENDUM

B. LEGAL, FINANCIAL AND COMPLIANCE INFORMATION

Cross reference: 30 CFR, Part 782 (March 13, 1979 FEDERAL REGISTER)

Southern Utah Fuel Company Mine Plan
February 12, 1977, pp 1, 10

This Addendum to Southern Utah Fuel Company Mine Plan of February 12, 1977, as amended, is hereby submitted pursuant to Title 40, Chapter 10, Utah Code Annotated 1953, as amended; the Cooperative Agreement between the United States Department of Interior and the State of Utah; the Surface Mining Control and Reclamation Act (PL 95-87); the Federal Land Policy and Management Act of 1976; and all regulations promulgated under those Acts affecting coal mining operations conducted in the State of Utah.

NAME AND ADDRESS
OF APPLICANT:

Coastal States Energy Company
Nine Greenway Plaza
Houston, Texas 77046

TELEPHONE NUMBERS:

Area Code (713) 877-6400
Area Code (801) 529-7428

LOCATION OF MINE AREA:

All or portions of
Section 36, T.21S.R.4E.,
SLC Meridian;
Sections 28, 29, 30, 31, 32, 33,
T.21S.R.5E., SLC Meridian;
Sections 1, 12, T.22S.R4E.,
SLC Meridian;
Sections 4, 5, 6, 7, 8, 17, 18, T.22S.
R.5E., SLC Meridian;
in Sevier County, Utah

MINERAL TO BE MINED:

Coal

OPERATOR: Southern Utah Fuel Company, a
wholly owned subsidiary of
Coastal States Energy Company
Nine Greenway Plaza
Houston, Texas 77046

PHONE NUMBER OF OPERATOR: Area Code (713) 877-6400

HOLDER OF RECORD: Coastal States Energy Company
Nine Greenway Plaza
Houston, Texas 77046

AGENT FOR SERVICE OF PROCESS: C. T. Corporation Systems
811 Dallas Avenue
Houston, Texas 77002

RESIDENT AGENT: Bernard W. Schrader
Coastal States Energy Company
Nine Greenway Plaza
Houston, Texas 77046

PHONE NUMBER OF RESIDENT AGENT: Area Code (713) 877-6859

I, the undersigned, hereby certify that the material and information contained in this 1979 Addendum to the February 12, 1977, Southern Utah Fuel Company Mine Plan, as amended, is complete and is correct to the best of my knowledge and belief.

Coastal States Energy Company

BY: 

(Senior Vice President)

State of Texas
County of Harris

Subscribed and sworn to and before me this 16th day of October,
1979.

Barbara J. Wickham
Notary Public for the State of Texas
Residing at Cypress, Harris County, Texas
My Commission Expires: July 17, 1981

BARBARA T. WICKHAM
Notary Public in and for Harris County, Texas

Business Designation

Southern Utah Fuel Company, a wholly owned subsidiary of Coastal States Energy Company, will be the mine operator. Coastal States Energy Company is a wholly owned subsidiary of Coastal States Gas Corporation.

O. S. Wyatt, Jr. is the only stockholder of Coastal States Gas Corporation owning more than five percent of the corporations's outstanding common stock.

The officers of Southern Utah Fuel Company are:

H. L. Blomquist, Jr.	Chairman of the Board
Leo C. Smith	President
Roy L. Gates	Senior Vice President
George L. Brundrett, Jr.	Senior Vice President and Secretary
James R. Paul	Senior Vice President and Treasurer
V. J. Mortensen	Vice President and General Manager
M. T. Arnold	Vice President and Assistant Secretary
Rex S. Bennett	Vice President
Thomas L. Gambill	Vice President
W. Jeffery Hart	Vice President
Austin M. O'Toole	Vice President and Secretary
H. deForest Ralph, Jr.	Vice President
Charles M. Wheat	Vice President
Loren A. Williams	Vice President
Glen A. Zumwalt	Vice President
J. Stewart Williams, Jr.	Controller
E. C. Simpson	Assistant Vice President
Robert A. Forrester	Assistant Secretary
J. J. Meadows	Assistant Secretary
Ronald A. Meadows	Assistant Secretary
Eugene O. Rooke	Assistant Secretary
John C. Simons	Assistant Secretary
C. Wesley Tyson, Jr.	Assistant Secretary
W. H. Brister	Assistant Treasurer
Fred D. Gray	Assistant Treasurer
Robert T. McCarthy	Assistant Treasurer
Dan L. Funderberg	Assistant Controller

R. G. Holsclaw	Assistant Controller
H. R. Natho	Assistant Controller
Donald L. Peters	Assistant Controller

The officers of Coastal States Energy Company are:

O. S. Wyatt, Jr.	Chairman of the Board
H. L. Blomquist, Jr.	President
Roy L. Gates	Senior Vice President
George L. Brundrett, Jr.	Senior Vice President
James R. Paul	Senior Vice President and Treasurer
Leo C. Smith	Senior Vice President
Ernest Solomon	Senior Vice President
M. T. Arnold	Vice President and Assistant Secretary
Rex S. Bennett	Vice President
Wesley F. Blankenship	Vice President
John E. Cooper	Vice President
Thomas L. Gambill	Vice President
W. Jeffery Hart	Vice President
Vernal J. Mortensen	Vice President
William E. McDowell	Vice President
Austin M. O'Toole	Vice President and Secretary
H. deForest Ralph, Jr.	Vice President
Fred O. Sharp, Jr.	Vice President
Charles M. Wheat	Vice President
Loren A. Williams	Vice President
J. Stewart Williams, Jr.	Controller
E. C. Simpson	Assistant Vice President
Robert A. Forrester	Assistant Secretary
J. J. Meadows	Assistant Secretary
Ronald A. Meadows	Assistant Secretary
Eugene O. Rooke	Assistant Secretary
John C. Simons	Assistant Secretary
C. Wesley Tyson, Jr.	Assistant Secretary
W. H. Brister	Assistant Treasurer
Fred D. Gray	Assistant Treasurer
Robert T. McCarthy	Assistant Treasurer
Dan L. Funderberg	Assistant Controller

R. G. Holsclaw
H. R. Natho
Donald L. Peters

Assistant Controller
Assistant Controller
Assistant Controller

The addresses and phone numbers for the officers and directors of Southern Utah Fuel Company or Coastal States Energy Company are the same as those for the companies for which the individuals are officers.

Written correspondence to Southern Utah Fuel Company or Coastal States Energy Company regarding the operations described in this Addendum should be addressed to:

Vice President and General Manager
Southern Utah Fuel Company
P. O. Box P
Salina, Utah 84654

Multiple Business Entities

Neither the company nor any major stockholder of the company having any interest, either legal or equitable, in the Southern Utah Fuel Company operation have had a State or Federal mining permit suspended or revoked or a security deposited in lieu of bond revoked.

Mining Permits - Compliance Information

Coastal States Energy Company presently holds an approved Mining Permit (Number ACT/041/002) for its underground mining operation (Southern Utah Fuel Company) located in Sevier County, Utah. The permit was approved and issued by the State of Utah Division of Oil, Gas and Mining on September 14, 1977 and the mining and reclamation plan for the operation was approved by the U.S. Geological Survey on February 3, 1978. The Mine Safety and Health Administration number for the mining operation is 42-00089.

Southern Utah Fuel Company has received a Notice of Violations of the Surface Mining Control and Reclamation Act of 1977 (P.L. 95-87). The Notice of Violations (No. 79-V-5-2) issued May 10, 1979 is pending appeal. Four violations said to have occurred are:

1. Failure to have a copy of the current mining permit to operate the mine available for inspection at or near the mine site.
2. Failure to grade road cuts, mine entry cuts and other surface work areas.
3. Failure to pass surface drainage from disturbed area through sedimentation ponds.
4. Failure to dispose excess rock and earth materials in an area approved by the regulatory authority.

Southern Utah Fuel Company responded to the Office of Surface Mining in a letter dated May 18, 1979. A conference with OSM was held on August 24, 1979 seeking re-evaluation of the Proposed Assessment of Penalties filed June 19, 1979; the information presented at that conference is under review at this time.

The conditions cited in the Notice of Violations have been abated, and Coastal States Energy Company intends to continue to operate its mining operations in compliance with all applicable laws and regulations.

Areas Designated Unsuitable For Mining

No portion of the area to be permitted is within an area designated as unsuitable for mining under the provision of 30 CFR Parts 764 and 765. To the best of the Applicant's knowledge, no portion of the area to be permitted is under study for being designated unsuitable for mining in an administrative proceeding under 30 CFR Parts 764 and 765.

The Applicant does not propose to conduct or locate surface facilities within 300 feet of any occupied dwelling.

Personal Injury and Property Damage Insurance Information

This section presents complete reproductions of Certificates of Insurance issued to Coastal States Gas Corporation and its subsidiary and affiliated companies, and is in due force of its public liability and property damage insurance policy. Said Certificates of Insurance are applicable to surface coal mining and reclamation operations as proposed in this Addendum and in the Southern Utah Mine Plan, as amended.

Suite 4500
1100 Milam Bldg.
Houston, Texas
77002

**Marsh &
McLennan**

CERTIFICATE OF INSURANCE

This is to certify that the Insurance Company listed below has issued the indicated insurance policies and they are in force at this time and that if such policies are cancelled or materially changed, the Company will give ten (10) days prior written notice to the holder of this Certificate.

Issued to: U. S. Department of Interior
Denver, Colorado

Insured's Name and Address: Coastal States Gas Corporation
including all Affiliated or Subsidiary Companies
Coastal Tower
Nine Greenway Plaza
Houston, Texas 77046

Type of Coverage	Policy Number	Policy Term	Limits of Liability
Workers' Compensation & Employers' Liability	61WBRF 10459E (Texas)	1-1-79/80	Statutory \$500,000 ea. accident
	61WBRF 10460E (All Other)		
	61WBF 10458E (California)		
Comprehensive General Liability including Contractual	61CF 10461E	1-1-79/80	<u>Bodily Injury</u> \$1,000,000 ea. occurrence \$1,000,000 aggregate <u>Property Damage</u> \$1,000,000 ea. occurrence \$1,000,000 aggregate
	61JPRF 10463E	1-1-79/80	<u>Bodily Injury</u> \$1,000,000 ea. occurrence \$1,000,000 aggregate <u>Property Damage</u> \$1,000,000 ea. occurrence \$1,000,000 aggregate
XCUI Exclusions Deleted			
Comprehensive Automobile Liability	61CF 10462E (All States)	1-1-79/80	<u>Bodily Injury</u> \$ 500,000 ea. person \$1,000,000 ea. occurrence <u>Property Damage</u> \$ 500,000 ea. occurrence

Date: August 9, 1979

The Hartford Insurance Group

Marsh & McLennan, Inc.

BY: Joe H. Bearden
Joe H. Bearden, Vice President

This Certificate of Insurance neither affirmatively nor negatively amends, extends or alters the coverage afforded by the policies shown.

Suite 4500
1100 Milam Bldg.
Houston, Texas
77002

**Marsh &
McLennan**

CERTIFICATE OF INSURANCE

This is to certify that the Insurance Company listed below has issued the indicated insurance policies and they are in force at this time and that if such policies are cancelled or materially changed, the Company will give ten (10) days prior written notice to the holder of this Certificate.

Issued to: State of Utah
Division of Oil, Gas and Mining
Salt Lake City, Utah

Insured's Name and Address: Coastal States Gas Corporation
including all Affiliated or Subsidiary Companies
Coastal Tower
Nine Greenway Plaza
Houston, Texas 77046

<u>Type of Coverage</u>	<u>Policy Number</u>	<u>Policy Term</u>	<u>Limits of Liability</u>
Workers' Compensation & Employers' Liability	61WBRF 10459E (Texas)	1-1-79/80	Statutory \$500,000 ea. accident
	61WBRF 10460E (All Other)		
	61WBF 10458E (California)		
Comprehensive General Liability including Contractual	61CF 10461E	1-1-79/80	<u>Bodily Injury</u> \$1,000,000 ea. occurrence \$1,000,000 aggregate
			<u>Property Damage</u> \$1,000,000 ea. occurrence \$1,000,000 aggregate
	61JPRF 10463E	1-1-79/80	<u>Bodily Injury</u> \$1,000,000 ea. occurrence \$1,000,000 aggregate
			<u>Property Damage</u> \$1,000,000 ea. occurrence \$1,000,000 aggregate
Comprehensive Automobile Liability	61CF 10462E (All States)	1-1-79/80	<u>Bodily Injury</u> \$ 500,000 ea. person \$1,000,000 ea. occurrence <u>Property Damage</u> \$ 500,000 ea. occurrence

Date: October 15, 1979

The Hartford Insurance Group

Marsh & McLennan, Inc.

BY: Joe H. Bearden
Joe H. Bearden, Vice President

This Certificate of Insurance neither affirmatively nor negatively amends, extends or alters the coverage afforded by the policies shown.

Identification of Public Office For Filing of Application

The Applicant has simultaneously filed a complete copy or copies of this Addendum with the following agencies:

State of Utah 4 Copies
Division of Oil, Gas, and Mining
1588 West North Temple
Salt Lake City, Utah 84116

Office of Surface Mining 7 Copies
Reclamation and Enforcement
Post Office Building Room 270
1823 Stout Street
Denver, Colorado 80202

United States Geological Survey 3 Copies
Office of the Area Mining Supervisor
Conservation Division
Administration Building
1745 West 1700 South
Salt Lake City, Utah 84104

United States Forest Service 3 Copies
Fishlake National Forest
55 South First East
Richfield, Utah 84701

United States Forest Service 3 Copies
Manti LaSal National Forest
350 East Main Street
Price, Utah 84501

C. QUITCHUPAH CANYON VENTILATION ENTRIES

Cross Reference: Item 1, Donald A. Crane, March 16, 1979, correspondence to Utah Division of Oil, Gas, and Mining. (Exhibit 1)

Map 1A, February 2, 1977, Mining Plan submittal.

Technical Examination for Environmental Analysis,
Coastal States Energy Company, April, 1975. (Exhibit 3)

Map 1A of the filed Southern Utah Fuel Company Mine Plan as filed illustrates the proposed extension to the set of sub-main entries designated "2 East and 3 East" from the main entries to the west wall of Quitchupah Canyon. Proposed is the construction of three temporary wooden portals at the end of these sub-mains which would be located immediately above the Starpoint Sandstone rock cliffs in the canyon wall. Each portal would measure approximately 8 feet high by 16 feet wide and the portals would be separated 50 to 85 feet horizontally depending upon the proper pillar sizing determined at the time mining progresses to this area. Steel mesh gates would be installed in each portal to prevent animal or human access into the mine and would be kept locked at all times except for inspection purposes. Keys to the locks will be kept within 50 feet of at least one gate on the inside of the mine out of reach of anyone on the outside.

The portals are necessary to provide intake ventilation air for the mine. As the mine workings are extended, the added friction of longer air courses restricts air flow. These proposed portals, in the proposed location, will enhance ventilation by reducing the effective length and increasing the effective cross sectional area of the air passageways.

Additionally, the portals will provide an emergency escapeway for mine personnel should a problem of some type restrict exit by normal route.

All construction access to these proposed portal sites will be from within the mine. No surface access routes will be established, and it is anticipated that the portals will not be readily distinguishable from the east rim across the canyon.

Upon the conclusion of mining, the portal sites will be sealed and revegetated in the same manner as the portals in East Spring Canyon. All construction materials will be removed prior to reclamation.

The proposed location is on a slope in excess of 100% (greater than 45°) and no topsoil is present in this location. The rock rubble will be inspected for archaeological artifacts or structures prior to break out, and the State of Utah Division of Oil, Gas, and Mining will be notified in the event such evidence is discovered.

No ground water is expected at the portal site. Hand-built rock diversion berms will be installed on top of the portals as necessary to prevent surface run-off from entering the mine.

D. SIGNS AND MARKERS

Cross Reference: Item 2, Donald A. Crane, March 16, 1979, correspondence to Utah Division of Oil, Gas, and Mining. (Exhibit 1)

30 CFR 817.11(g)

Exhibit 11

Three identification signs have been placed on the only possible vehicle access routes to the mine surface facilities area. Two of these routes are via a previously existing four-wheel drive, or cattle, trail. The third sign was placed adjacent to the main access road to the mine on the permit boundary. Sign locations are designated on Exhibit 11 of this 1979 Mine Plan Addendum.

The signs measure 4 feet by 8 feet. They show the mine name, company name, telephone numbers, MSHA I.D. number, EPA Permit number, and Federal Coal Lease numbers pertinent to the Southern Utah Fuel Company operation.

No top soil storage areas have been established for the 38-year old Southern Utah Fuel Company operation. It is planned that top soil be brought in from private land plots (possibly in the Sevier Valley) for reclamation purposes upon conclusion of the operation. Any additional construction which increases the disturbed area in the future will require top soil removal and storage. This will include construction, upon approval of design by the regulatory authority, of the Drainage Facilities and Sediment Control Structures proposed in this 1979 Addendum. Topsoil will be stored adjacent to the Sediment Pond and shall be clearly marked with signs stating "Topsoil Storage Area" in and around the perimeter of the storage area. This topsoil storage area will be seeded in accordance with standard revegetation procedures described in this Addendum.

E. LANDUSE

Cross Reference: Item 3, Donald A. Crane, OSM, March 16, 1979, correspondence to Utah Division of Oil, Gas, and Mining. (Exhibit 1)

February 12, 1979 Mining Plan Submittal, pp 8-10.

Technical Examination for Environmental Analysis, Coastal States Energy Company, April, 1975, pp 2, 6-8. (Exhibit 2)

Environmental Analysis for Mining and Reclamation Plan on Federal Coal Leases - SL-062583, U-062453, U-0149084, U-28297 prepared by Ralph J. Blumer, Office of the Area Mining Supervisor, Conservation Division, Administration Building, 1745 West 1700 South, Salt Lake City, Utah, 84104. (Exhibit 3)

Environmental Assessment Record/Technical Examination, Title 43 CFR Part 3041, Federal Coal Lease Sale U-28297, Branch of Environmental Assessment, B.L.M., Utah State Office, University Club Building, 136 East South Temple, Salt Lake City, Utah, pp. 14-16, pp 40-48. (Exhibit 4)

Environmental Assessment and Monitoring for the Southern Utah Fuel Company Mine near Salina, Utah, 1978, M. K. Botz, WESTECH, 2301 Colonial Drive, Helena, Montana, 59601, pp. 29-48. (Exhibit 5)

Environmental Monitoring Program for 1979 Salina, Utah, M. K. SUFCo Mine, Botz, Helena, Montana, May 18, 1979. Hydrometrics. (Exhibit 6)

1. General

The SUFCo lease area is predominantly U.S. Forest Service land managed under the multiple use and sustained yield concepts. Present management emphasizes livestock grazing, wildlife, timber and watershed development.

The landuse plan for the lease area lists the following management goals for the area (U.S. Forest Service 1976):

- a. Fire - Allow fire to burn to a specified acreage. Fire behavioral factors and public safety will guide the choice of suppression force and equipment used.
- b. Landscape - Modification. Activities may visually dominate the original characteristic landscape. However, vegetative and landform alterations will borrow from naturally established form, line, color, or texture. Introduced facilities borrow all naturally established components.
- c. Land ownership - Adjustments desirable. Potentials for land adjustment for improved management are present. However, delay would not result in any irreversible losses to the resource.
- d. Minerals - Normal activities and near natural rehabilitation. Mineral activities will use accepted standard or proven techniques. Rehabilitation will restore the land and vegetation to as near a natural and productive condition as possible. Erosion hazards will be minimized. All evidence of abandoned improvements will be removed, and most activity evidence will be eliminated.
- e. Range - Coordinated. The unit is suitable for livestock production. Competition from other uses is present. Livestock management will be directed primarily toward the improvement of the other values as well as the range resource.

- f. Recreation - Undeveloped. Dispersed recreation use will occur subject to other resource uses. No facilities are provided.
 - g. Special uses - Organizations. Use may be permitted to non-profit groups for the benefit of their member or a specified class of uses.
 - h. Timber - Salvage. Harvest dead and dying timber to minimize loss of saleable material. Use methods that will not damage other resources values.
 - i. Transportation - Sensitive environment with high resource demand. Transportation system can consist of arterial, collector, service, and terminal facilities. Trails will take the place of service and terminal facilities where possible.
 - j. Unique environment - Retain. Known sites should be retained for further study. Their actual character is not known.
 - k. Watershed - Improve. Manage resources and uses on other activities to improve water quality.
 - l. Wildlife - Protect. Habitat suitable for hosting threatened or endangered species or the habitat is critical winter range or calving or fawning areas for big game. Habitat changes will be initiated if they are not detrimental to these primary wildlife.
 - m. Wilderness - Development. Areas where a variety of forest activities are taking place. Vehicular access is good to most points and resource development is active but not dominant.
2. Grazing Carrying Capacities and Range Condition

The majority of the SUFCo mine area is within the Quitchupah allotment - Old Woman Management Area, Salina Planning Unit, Fishlake National Forest. The Old Woman Management Area, containing

approximately 43,000 acres, presently supports 965 cattle for 1,330 cow months and 4,850 sheep for 10,100 sheep months (U.S. Forest Service, 1976). This represents an average of seven acres per animal month for the planning unit.

WESTECH (1978) described the major vegetation communities in the SUFCo lease area and identified the following communities:

- Pinyon/juniper woodland
- Sagebrush/grassland
- Ponderosa pine
- Mountain shrub
- Mixed conifer
- Aspen

The U.S. Forest Service (unpublished data, 1971) has mapped similar plant communities for the Quitchupah grazing allotment and determined range suitability and condition for each mapping unit. The pinyon/juniper woodland occurs on steep unstable slopes and is considered unsuitable for grazing although it is grazed within the allotment. The vegetation condition rating within the pinyon/juniper woodland type was considered good with a rating of 68. Forage production (mainly Indian rice-grass and bluebunch wheatgrass) is low. Arnold et. al. (1964), Jameson and Dodd (1964), and Jameson (1971) found that as tree canopy increased, understory vegetation decreased. Phillips (1965) found that mature stands with a 74 per unit crown canopy produced 96 pounds of forage per acre while stands with 1-2 percent cover produced from 418-577 pounds per acre. Lewis et. al. (1965-1967) found production values between 40 and 460 pounds per acre in stands sampled. Areas where trees had been removed produced as much as 900 pounds per acre. Canopy cover of pinyon and juniper in the SUFCo lease area is fairly dense and forage production in the type would generally be less than 100 lbs./acre in an average year. Assuming 50 percent utilization and 25 lbs./animal/day, it would take 15 acres to carry an animal for a month.

A large part of the flatter upland area is dominated by sagebrush/grassland. The U.S. Forest Service (unpublished, 1971) has mapped

this area as suitable rangeland with vegetation condition ratings between 45 and 74. The sagebrush/grassland type within the SUFCo lease area is the most desirable type for grazing, producing the most available forage per acre for livestock. It generally has lower vegetation condition ratings than other types indicating it receives heavier grazing pressure. Three transects established in 1971 by the U.S. Forest Service on the SUFCo lease area averaged 1100 lbs/acre (dry weight). Of this, about 940 lbs/acre was perennial grasses and sedges. The transects established, however, are in areas where shrub coverage is low and forage production would probably be lower for most of the sagebrush/grassland type where shrub coverage is higher. For this type, it would take 2-3 acres to carry an animal for a month. The U.S. Forest Service estimates a carrying capacity of 0.5 animal units per month (AUM) per acre (B. Bass personal correspondence, 1979).

The aspen type is an important producer of forage for big game and domestic stock. A high percentage of the production is forbs which makes this type more desirable to big game and sheep. Mature aspen with a herbaceous understory in good to excellent condition will produce from 1,000 to 1,800 lbs/acre air dry forage (Lewis, 1971). The U.S. Forest Service estimates that in this area, aspen type produces 1,000 to 1,500 lbs/acre with 0.6 to 0.65 AUM/acre (M. Stubbs personal correspondence, 1979). Most of the aspen stands in the SUFCo lease area are seral with vegetation condition ratings between 45 and 58 (U.S. Forest Service, unpublished, 1971).

The ponderosa pine, mountain shrub and coniferous forest types are generally lower forage producers although the extent of these types on the study area makes them an important component of the grazing system. Portions of these types, especially along the steep canyon walls have been rated unsuitable for grazing and receive little grazing pressure due to limited accessibility to livestock. Areas of these types on more gentle slopes receive heavier grazing as indicated by lower vegetation condition ratings (generally around 60). These areas provide some forage for livestock and are valuable forage producers for big game. Julander (1955) estimated forage production for mountain brush and oak types. He found that the

mountain brush type produced 723 lbs/acre (green weight) of which 11 lbs/acre were grasses. He found that grasses are preferred forage for cattle and are selected as their key forage species. Where grasses are unavailable, however, cattle used forb and shrub species resulting in competition with big game species.

Valley bottoms receive little grazing pressure except in the vicinity of water sources where pressure is locally heavy. Valley bottoms are generally narrow and represent limited available forage. Steep slopes receive limited grazing pressure from livestock because of the steep inclines and lack of water. Flatter mesa tops and rolling terrain received heavier pressure because of easier movement by livestock and more available forage. Grazing pressure is heaviest around water sources in these more accessible areas.

3. Timber

Very little of the SUFCo lease area is in vegetation communities capable of producing timber products. The pinyon/juniper woodland generally occurs on steep, unstable slopes making it undesirable for accessibility. Very limited use may be made of this type for post production although evidence of harvesting is lacking on the lease area.

The coniferous forest type also occurs on steep slopes and generally in small stands. Economics of harvesting these stands would result in a high cost/benefit ratio. Other than very limited consumption for posts and poles, this type receives no use in the lease area as a timber producer. Christmas tree cutting, however, is higher in this type than others in the area.

The ponderosa pine type is the only vegetation community receiving substantial use for timber production. This type generally occurs on flatter sandy sites and is readily accessible. Large, mature (250 + years) trees have been harvested on a selective basis. Pine regeneration in cut over stands is sparse and mountain mahogany and manzanita appear to be increasing in the understory. Within the SUFCo lease area approximately 528 thousand board feet (MBF) have

been harvested between 1977 and 1978 with average volumes of 1.3 average net volume/acre (M. Stubbs personal correspondence, 1979).

Quaking aspen stands receive limited local pressure for posts and poles.

4. Hunter and Recreation Use

The number of hunters in the Salina Planning Unit increased 122 percent from 1969 to 1972 (U.S. Forest Service, 1976). Present levels of use in the Old Woman Management Area show 1,200 hunter use days annually of which 1,000 are for big game. Present levels of hunter use in the Skumpah Management Area total 5,120 annually of which 4,320 are for big game. Most of the SUFCo lease area is within the Old Woman Management Area although a portion of the northern end is within the Skumpah Management Area.

Recreation use (excluding hunting) totals 4,600 in the Old Woman Management Area and 18,300 in the Skumpah Management Area annually. Most of this use is dispersed camping although winter sports and fishing are listed as minor uses.

Literature Cited (Landuse)

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- U.S. Forest Service. 1976. Final environmental statement for landuse plan, Salina Planning Unit, Fishlake National Forest. USDA, Forest Service, Intermountain Regional.
- WESTECH. 1978. Environmental assessment and impact evaluation of underground coal mining at the Southern Utah Fuel Company property in central Utah. Technical report prepared for Coastal States Energy Company.

F. DISPOSAL OF SPOIL AND WASTE MATERIAL

Cross Reference: Item 5, Donald A. Crane, OSM, March 16, 1979 correspondence to Utah Division of Oil, Gas, and Mining. (Exhibit 1)

February 12, 1977 Mining Plan Submittal, p 19.

Technical Examination for Environmental Analysis, Coastal States Energy Company, April, 1975. (Exhibit 3)

Spoil/Waste Sampling and Analysis Report by Alvin R. Southard, June, 1979. (Exhibit 7)

1. Mining Operations Trash and Garbage Disposal

Presently, trash from the operations consists of old brattice cloth, ventilation tubing, barrels, broken timbers, wire, broken machinery parts, paper, cardboard boxes and food garbage. This material is stored on a temporary basis in a protected trench near the guard shack on the property. It takes approximately two weeks to accumulate enough waste to require assigning a truck to haul the material from the mine site. The trash is loaded with a front-end loader and hauled to the Salina City Municipal Sanitary Land-fill thirty miles away. Southern Utah Fuel Company has a cooperative agreement with the city to use the disposal area on a set fee-per-ton basis.

The temporary storage area at the mine is protected from the wind by high walls on three sides. The access to the area is sloped inward to prevent water run-off from the pile.

2. Disposal of Mining Spoil and Waste Rock

During recent years, the mine has produced between 2,000 and 3,000 tons of rock material each year from special underground construction projects which require removal of roof or floor strata. The practice, which continued from 1941 through March, 1979, was to use this material to extend the fill face in the mine yard to gain additional surface area for the mining facilities in East Spring Canyon. Until

the implementation of Public Law 95-87, this was a planned practice approved by the governing agencies; the U.S.G.S. and U.S. Forest Service.

Because Public Law 95-87 requires specific methods of emplacement, Southern Utah Fuel Company determined that an alternate disposal solution is to modify mining practices to minimize waste rock production and to dispose of the smaller amount of rock within the mine. Consequently, no waste rock material shall be transported outside of the underground mine for disposal purposes.

G. DRAINAGE FACILITIES AND SEDIMENT CONTROL PLAN

Cross Reference: Items 6, 8, 9, and 11, of Donald A. Crane, O.S.M., March 16, 1979, correspondence to Utah Division of Oil, Gas, and Mining. (Exhibit 1)

February 12, 1977 Mining Plan, as amended.

Drainage Facilities and Sediment Control Plan for Southern Utah Fuel Company Mine No. 1, September 17, 1979, Merrick and Company, Denver, Colorado. (Exhibit 9)

Hydrologic Impact of Roads and Diversion of Overland Flow

The September 17, 1979, Drainage Facilities and Sediment Control Plan submitted with this Addendum supersedes all previous plan and amendments thereto. The objective of the present plan is to isolate, to the maximum degree possible, run-off from disturbed areas from that of undisturbed areas. This will be accomplished by:

1. Allowing all upstream run-off to by-pass the disturbed area (surface facilities) via a network of culverts;
2. Routing run-off from the undisturbed east slope above the facilities down diversion ditches in the east side road to by-pass the disturbed area; and
3. Routing of any run-off from undisturbed areas which enters the disturbed area into the sediment control systems.

A. East Side-road

The east side-road existed prior to mining activities for the purpose of cattle drive access to and from Old Woman Plateau in the spring and fall. It is still used for this purpose and for four-wheel drive recreation by the residents of Emery County. This usage, in combination with Southern Utah Fuel Company's occasional use for access to an electrical power substation and water tank, is reason to classify it as a Class III road. Due to the road's existence and use before initiation of mining in 1941 and its present uses, the Applicant proposes to maintain the section of the road which is used jointly for multiple

use during the life of the mine such that the present use of other than mining traffic can continue beyond the date of termination of mining and reclamation.

Southern Utah Fuel Company has rerouted the road between elevations 7550 and 7625 due to excavations for the present office/changehouse building. The grade of the road in this area averages 7.7% over the 975 foot length. The maximum grade within this length is between elevations 7575 feet and 7595 feet where the grade is 13%.

Southern Utah Fuel Company has constructed water-bars in the road approximately every 200 feet from Convulsion Canyon to the water tank. These earth structures slow drainage and then divert water flow to minimize erosion of the road. Contingent upon approval of this Addendum, a riprapped diversion ditch will be installed along the edge of the road between elevations 7550 feet and 7700 feet. This ditch will capture run-off from the higher slope and allow it to by-pass the disturbed area below. The ditch will be equipped with mini-water-bars constructed of rock to dissipate hydraulic energy.

B. Closed Water Tank Road

When the water tank at the mine (coordinate location N104,150 E102,800) was installed in 1975, a site access road was constructed southwest of the buried tank. This road is 265 feet long and has a 36% grade. Southern Utah Fuel Company has closed the road and constructed erosion control water bars on it. It will be revegetated during the spring of 1980 with Southern Utah Fuel Company's standard revegetation seed mixture listed in the Final Reclamation Section of this Addendum.

C. Mine Access Road

The main mine access road is a paved Sevier County Road which extends from the Interstate 70 highway to the mine site. Various highway tax sources fund road maintenance to the permit area. Southern Utah Fuel Company is responsible for the maintenance of the road on the permit area which is 350 feet from the guard shack north to the surface facilities area. Run-off water from this unpaved road section is routed into the disturbed surface facilities area and through the main sediment control structures. The gradient of the road is 2.1% from the permit boundary down the disturbed

area. A berm on the downhill side of the road channels water flow to the sedimentation pond.

The proposed sediment pond (Exhibits 9) and approximately 1,000 feet of intake pipe would be constructed on land presently not included in the permit area. Southern Utah Fuel Company has applied for a special use permit from the Fishlake National Forest for the right-of-way and pond location. Upon issuance of the special use permit to the Applicant and the approval of the amended mining permit, these areas will be included in the over-all mine permit area with respect to the Applicant's responsibility for maintenance and final reclamation.

Disturbance areas resulting from construction of the sediment control structure will be reclaimed and revegetated upon completion of the installation. The sediment pond and diversion structures will be maintained and reclaimed by Southern Utah Fuel Company in accordance with 30 CFR 817.45 (h), 30 CFR 77.216-3, and 30 CFR 817.45 (u).

H. SURFACE WATER MONITORING

Cross References: Item 7, Donald A. Crane, OSM, March 16, 1979, correspondence to Utah Division of Oil, Gas, and Mining. (Exhibit 1)

February 12, 1977 Mining Plan
Submitted as amended, p. 16, 21, and 75.

30 CFR 817.42

30 CFR 817.52

Environmental Assessment and Monitoring for Southern Utah Fuel Company Mine near Salina, Utah, 1978, M. K. Botz, WESTECH, Helena, Montana, pp 4-20. (Exhibit 5)

Environmental Monitoring Program for 1979, SUFCo Mine, Salina, Utah, M. K. Botz, Hydrometrics, Helena, Montana. (Exhibit 6)

Water Quality Analysis, No. 79-005384, Ford Chemical Laboratory, Inc., Salt Lake City, Utah, August 15, 1979. (Exhibit 8)

Southern Utah Fuel Company initiated a surface water monitoring program in 1977. Although it may be modified occasionally to better fit the company's and governmental requirements, the company will conduct the program throughout the life of the mine.

1. Analytical Quality Control

A quality assurance program is used both in the field and in the laboratory to minimize errors in water quality data. The field samples are collected, stored and preserved in accordance with EPA recommended techniques. In addition, all field personnel are experienced in sampling and flow measuring. All sampling is conducted by or under the direct supervision of Mr. M. K. Botz of Hydrometrics, Inc. Mr. Botz formerly was chief of technical investigations for the Montana Water Quality Bureau.

Field quality control also is accomplished by submittal of duplicate and blank samples to the testing laboratory.

The laboratory quality control program implemented by Ford Chemicals of Salt Lake City consists of the following:

- a. Fifteen percent of the analytical samples are quality control samples.
- b. EPA reference standards are used.
- c. Commercial reference standards are used.
- d. In-lab reference standards are used.
- e. Duplicate samples to measure reproducibility; and the standard addition method is used for measuring recovery and accuracy.
- f. In-house coordination of laboratory director and chemists.

All analytical results are examined by Hydrometrics, Inc. and are compared with past data to locate possible sampling and analytical errors. Samples having questionable results are retested or the sample is retaken.

2. Manganese Analysis

Manganese was inadvertently left off the previous routine analysis list. This element has, however, been tested on all water samples and is now on the routine analysis list.

3. Monitoring Reports

Whenever possible, all monitoring data will be submitted within 60 days of sample collection. Time for laboratory analyses typically ranges from 30 to 45 days. A review of analytical results and sample retesting can make it difficult to consistently meet a 60 day time limit.

4. Sediment Pond Monitoring

Discharge from the sediment pond will be sampled whenever it occurs. This sampling point will be added to the monitoring schedule. It is expected, however, that discharge from this pond will be an infrequent event; consequently, sampling will be infrequent.

5. Monitoring Results

All monitoring results since 1977 are contained in consultant reports to SUFCo. Copies of these results will be provided as they are made available. Normally hydrological work is done in the late spring and in the fall. Monitoring reports are completed in the winter. These reports will be submitted to OSM after completion.

I. GROUND WATER SYSTEMS

Cross References: Item 7, Donald A. Crane, OSM, March 16, 1979,
correspondence to Utah Division of Oil, Gas, and Mining.
(Exhibit 1)

February 12, 1977, Mining Plan, as amended.

30 CFR 817.43

30 CFR 817.52

Environmental Assessment and Monitoring for the Southern
Utah Fuel Company Mine near Salina, Utah, 1978, M. K.
Botz, WESTECH, Helena, Montana, pp 4-20. (Exhibit 5)

Environmental Monitoring Program for 1979, SUFCo Mine,
Salina, Utah, M. K. Botz, Hydrometrics, Helena, Montana.
(Exhibit 6)

Water Quality Analysis, No. 79-005384
Ford Chemical Laboratory, Inc., Salt
Lake City, Utah, August 15, 1979. (Exhibit 8)

1. Spring Survey

Surveys of springs and seeps were made in 1978, and a 1979 survey will be completed in the fall of 1979. Results of the 1979 survey will be submitted to the appropriate agencies.

2. Water Supply and Waste Water Discharge

SUFCo obtains the mine water supply from a groundwater infiltration system in Convulsion Canyon just upstream from East Spring Canyon. Approximately 300 feet of perforated 4-inch PVC pipe is buried in a former spring area west of the pumphouse. This ^system provides water to the mine.

Sanitary wastes from the mine (primarily from the changehouse) are piped to a septic tank, with the effluent going to a drainfield located in the Convulsion Canyon downstream from East Spring Canyon. There is no discharge to the creek and the drainfield is several hundred feet from the stream. No adverse environmental effects are expected from this system and no effects on water quality have been observed.

J. SOILS

Cross Reference: Item 12, Donald A. Crane, O.S.M., March 16, 1979, correspondence to the Utah Division of Oil, Gas, and Mining. (Exhibit 1)

February 12, 1977 SUFCo Mine Plan, as amended, pp 5, 19.

Correspondence from Alvin R. Southard, Certified Professional Soil Scientist, Utah State University, May 19, 1979. (Exhibit 7).

Drainage Facilities and Sediment Control Plan for Southern Utah Fuel Company, Mine No. 1, September 17, 1979, Merrick and Company, Denver, Colorado. (Exhibit 9)

1. Soil Mapping Unit

Soils in the "V" shaped canyon in which the SUFCo Mine (surface facilities) is located are mapped as a complex of two soils referred to here as Soil A and B (see soil descriptions). Included in this complex are some soils less than 20 inches deep over bedrock or shale, small areas of soils over 48 inches deep in narrow filled draws and drainage head areas; soils shallower than 20 inches comprise about 20 percent of the area; soils deeper than 48 inches cover about 5 percent; and rock outcrops comprise about 5 percent of the area examined.

The landscape can be described as steep and stony with horizontal massive sandstone ledges interspersed with silty-clay shale layers. The soils have formed from residual sandstone and shale particles that became mixed via gravitational creep. Because this soil material has moved downslope and settled, it exhibits a range in texture throughout the soil profile from sandy loam to silty clay loam. Surface and subsurface layers are often stony.

The composition of Soils A and B are not generally affected by aspect, however, aspect is primarily responsible for a difference in vegetation. In areas with

with a tree canopy, the mineral soil has a thin layer of litter overlaying a one to two inch A2 layer of gray, leached, mineral soil material. This condition is an exception, a variant of Soil A as it is described, and has little affect on the capability of the mapping unit as a whole.

2. Soil A - SUFCo Mine

Samples were collected in an undisturbed area above the mine portal and north-east of the transformer area. Soils are on a west facing 20 to 35 percent slope. The overstory vegetation consists of limber pine, juniper, mountain mahogany, Douglas fir and some ponderosa pine. The understory consists of bunch grasses, Oregon grape, sego lily, indian paintbrush, asters and annuals. Soils vary in depth from 20 to 25 inches. They are developing on weathered sandstone, siltstone and silty clay shale which occur in layers of variable thickness. Most of the soils in this area have stony surfaces, and are well drained with no salt or alkali.

Representative Profile of Soil "A" stony loam:

A1 0-8" Grayish brown (2.5Y5/2) dry, stony loam; dark grayish brown (2.5Y4/2) moist; moderate fine platy structure; slightly hard when dry, very friable when moist, slightly sticky and slightly plastic when wet; moderate effervescence; pH 8.0; clear smooth boundary.

B2 8-18" Dark grayish brown (2.5Y4/2) dry, smooth stony loam; very dark grayish brown (2.5Y3/2) moist; moderate medium blocky structure; hard when dry, friable, when moist slightly sticky and slightly plastic when wet; weak effervescence; pH 9.0; clear smooth boundary.

C 18-24" Light brownish gray (2.5Y6/3) silty, clay loam; grayish brown (2.5Y5/2) moist; massive structure; hard when dry, firm when moist, sticky and plastic when wet; strong effervescence; pH 8.2; clear smooth boundary.

C-R 24-48" Grayish brown (2.5Y5/2) dry, partially weathered silty clay loam shale; dark grayish brown (2.5Y4/2) moist; weak, coarse platy to massive structure; hard when dry, firm when moist, sticky and plastic when wet; strong effervescence; pH 8.4.

3. Soil B - SUFCo Mine

Samples were collected from an undisturbed area west of the guard house on the hillside above the road leading to the mine load out. The sample site is an east facing mountain slope of 30 to 40 percent. Stony surface layers dominate the site. Vegetation consists primarily of native grasses with a few scattered conifers. The soils are well drained and have no toxic levels of salt or alkali.

Representative profile of Soil "B" stony sandy loam:

A1 0-5" Light brownish gray (10YR6/2) dry stony sand loam; dark grayish brown (10YR4/2) moist; weak medium platy structure; slightly hard when dry, very friable when moist, slightly sticky and slightly plastic when wet; weak effervescence, pH 8.0; clear smooth boundary.

B2 5-10" Light brownish gray (10YR6/2) dry, coarse textured loam; grayish brown (10YR5/2) moist; moderate medium blocky structure; slightly hard when dry, very friable when moist, slightly sticky and slightly plastic when wet; weak effervescence; pH 8.2; clear smooth boundary.

C1 Ca 10-32" Light brownish gray (10YR6/2) dry, coarse textured loam; dark grayish brown (10YR4/2) moist; massive structure; slightly hard when dry, very friable when moist; slightly sticky and slightly plastic when wet; strong effervescence; pH 8.2 clear smooth boundary.

C2 Ca 32-48" Brown (10YR5/3) dry, sandy loam; dark brown (10YR4/3) moist; massive structure; slightly hard when dry, very friable when moist, slightly sticky and slightly plastic when wet; pH 8.2.

4. Soil C - Sediment Basin Area at Confluence of East Spring and Convulsion Canyons

This area consists of deep soils on recent alluvial deposits. A typical profile in this area is highly stratified with sandy loam and loamy sand textures dominating. The 4 to 6 inch surface layer (A1) is a little darker in color than the underlying layers and it varies from loam to loamy sand in texture. An occasional buried A horizon was observed at variable depths throughout the

profile. This soil is on a 2 to 5 percent sloping terrace adjacent to a natural, deep drainageway. It is presently quite heavily vegetated.

A sediment basin will be constructed at this site to collect runoff from the mine area, roads and any other disturbed soil areas.

5. Disturbed Soil Areas

In those areas with soil disturbance related to mining activities, the soils have lost their identity. They have been, in most instances, quite thoroughly mixed. As a result of this action, the soil textures and depths have been altered. Textures are now primarily smooth loams and silty clay loams and depths over indurated material or shale is greater than 30 inches for most of the area. An exception to this is along the "cut" slopes of the mountain where the raw geologic strata are exposed.

As a result of this disturbance in "fill" areas, the potential for reclamation has been enhanced. The soils are deeper and the resulting textures are more desirable for plant growth.

6. Soil and Waste Area

Laboratory results from samples collected by Dr. Southard (Exhibit 7, Report to SUFCo, May 1979) indicates low salt, sodium and SAR values. Trace mineral levels are all below toxicity levels. Fertilizer recommendations by Dr. Southard should be followed provided his "revegetation strategy" is used. His fertilizer recommendations should also be followed for the revegetation of other areas.

7. Topsoiling Material

In all areas proposed for disturbance related to expansion of mining activities, all suitable topsoiling material will be salvaged and stockpiled unless sufficient graded areas are available for immediate distribution. Stripping of topsoil for stockpiling will require equipment operators to use caution and personal judgement to avoid salvage of materials unsuitable for topsoil. All of the soils have considerable variation in amounts of coarse fragments over short distances. Equipment operators will be made aware of this in

order to avoid placing soil materials with high concentrations of coarse fragments in the topsoil stockpile.

Soil salvage will take place in two lifts where possible. The first lift will include the A horizon material to be stockpiled in one location and the second lift will include the remaining B and C horizons, excluding material with a coarse fragment content of over 50 percent. The latter would be stockpiled in a second, but adjacent location. These stockpiles will be graded to gradual slopes and seeded to promote surface stabilization. During the re-topsoiling of disturbed areas, the B and C horizon material will be spread on first, followed by spreading of the A horizon as the surface layer.

The spoil surfaces will be left roughened in final contour grading to eliminate slippage zones after the topsoil layer (A horizon) is spread. The topsoil layer will be spread to achieve as uniform a thickness as is practical.

Reclamation of abandoned roads will follow the same technique as for spoil areas except the roadbed will be ripped, scarified, disced or otherwise conditioned prior to topsoil placement. The Applicant will take all measures necessary to assure the stability of topsoil on graded spoil slopes, and extreme care will be exercised to guard against erosion during topsoil application and revegetation.

8. Environmental Impacts

The potential environmental impacts to the soils include: (1) direct soil disturbance and soil compaction during mining, grading, leveling and construction; (2) soil erosion from areas during the above activities where inadequate soil erosion prevention measures were applied; (3) mass soil movement initiated by the above activities.

K. VEGETATION MAP

Cross References: Item 13, Donald A. Crane, March 16, 1979, correspondence to the Utah Division of Oil, Gas, and Mining. (Exhibit 1)

February 12, 1977, SUFCo Mine Plan, as amended.

Part E, Landuses

The map of the vegetation occurrence over the lease area is included herein as Exhibit 10.

L. WILDLIFE

Cross References: Item 14, Donald A. Crane, OSM, March 16, 1979.
correspondence to the Utah Division of Oil, Gas,
and Mining. (Exhibit 1)

February 12, 1977 SUFCo Mine Plan, as amended, p. 8.

Environmental Assessment and Monitoring for the
Southern Utah Fuel Company Mine near Salina, Utah
1978, M. K. Botz, WESTECH, Helena, Montana,
pp. 29-48. (Exhibit 5)

Ordinarily, planning to mitigate mining impacts on wildlife occurs prior to any disturbance, and takes three forms: 1) design of facilities, roads, etc., to minimize impacts, 2) operation of the mine and associated facilities to minimize impacts, and 3) enhancement of wildlife habitat away from the mine in order to mitigate any losses that occur from mining. It is believed that the reclamation/revegetation program will at least partially replace habitat loss.

In the case of the SUFCo Mine, preconstruction design cannot be considered except for major additions or modification, since the mine has been in operation, for nearly forty years. Very little can be done at this point in time to change the design of the facilities to lessen the impacts.

The present portal facility is located in East Spring Canyon. It appears that mule deer and elk may migrate down canyons to lower altitudes during severe winters. Numerous side canyons to Convulsion Canyon have been left undisturbed to allow uninterrupted big game movement.

During operation of the mine, several steps have been taken to minimize wildlife loss and/or harassment. Speed limits are posted on access routes to the mine to allow the operator to anticipate collisions with wildlife. Although the danger of such collisions is greater to wildlife than to haul trucks, there is the possibility of loss of human life as well as equipment damage.

Therefore, avoiding collisions is a practical company policy. Wildlife crossing areas or sites of limited visibility are adequately marked and the Applicant has initiated the use of a commuter bus for the 230 employees between the mine and Salina, Utah.

The Applicant prohibits the handling or discharge of firearms by employees on the road or in East Spring Canyon although non-mine employees cannot be regulated by the above measures. Since much of the land in the Southern Utah Fuel Company project area is public domain, it may be desirable to control public recreational use of that area by:

1. Changing hunting unit boundaries, season dates, game limits, etc.
2. Restricting vehicle travel in areas of high seasonal wildlife use, such as the elk/deer wintering area above the mine.
3. Restricting dispersed recreation in the area; for example, restricting camping to an established campground.
4. Additional law enforcement may be necessary to control illegal killing of wildlife, if such develops.

Enhancing wildlife habitat away from the mine area would improve habitat, possibly increase wildlife numbers, and possibly attract wildlife away from impacted areas. Since much of the area is public domain, enhancement is a viable management tool. However, any such effort should be carefully coordinated among appropriate regulatory agencies. Some examples of these measures include:

1. Development of springs, wells or other water supplies outside the mine area. Fencing of developed water sources to restrict cattle trampling of vegetation, control erosion, and provide non-game habitat;
2. Altered livestock management policies, to avoid potential competition with wildlife, or instances of cattle/elk incompatibility (Montana Cooperative Elk-logging Study, 1979);
3. Control of other human-related impacts, including recreation (discussed above) and timber harvest;
4. The winter range is in poor condition (USGS, 1976). Habitat improvement could be initiated using guidelines similar to those in Plummer, Christensen and Monsen (1968).

Revegetation of disturbed areas, as part of the reclamation effort, will not be monotypic. Rather, a mixture of grasses, forbs, shrubs and perhaps trees is planned.

Literature Cited

Montana Cooperative Elk-logging Study. 1979. Annual progress report for the period Jan. 1 - Dec. 31, 1978. U.S. Forest Service, Missoula, Montana.

Plummer, A.P., Christensen, D.R. and Monsen, S.B. 1968. Restoring big-game range in Utah. Utah Div. Wldl. Resourc. Publ. No. 68-3.

U.S. Forest Service, 1976. Final environmental statement for land use plan, Salina Planning Unit, Fishlake National Forest.

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Wyoming Game and Fish Department. 1976. Consideration for wildlife in industrial development and reclamation. Wyoming Game and Fish Department, Cheyenne, Wyoming.

M. DUST CONTROL

CROSS REFERENCES:

Item 15, Donald A. Crane, OSM, March 16, 1979, correspondence to the Utah Division of Oil, Gas, and Mining. (Exhibit 1)

Environmental Assessment Record Technical Examination, Title 43 CFR, Part 3041, Federal Coal Lease Sale U-28297. p. 34. (Exhibit 4)

1. Background Information

The SUFCo Mine is an underground coal mine located southeast of Salina, Utah. The current rate of production is 1.65 million tons per year, with a projected increase to 2.1 million tons per year in the near future. The mine portal and attendant load out facilities are situated near the apex of a semi-arid incised canyon at an elevation of approximately 7,600 feet. Because the surrounding surface rises sharply above the service area, coal crushing and loading areas together with mine offices and equipment repair buildings are extremely compact. The total area for the surface operation encompasses less than fifteen acres. Access to the mine is provided by a paved road in excellent condition. Immediately beyond the mine service area, the canyon splits into three smaller fingers extending short distances to the northeast, north and northwest and to the top of the plateau. The amount of relief from the mine service area to the top of the plateau is 1500 feet. The topography rises about 1200 feet in approximately one-half mile immediately above and to the east of the main portal area.

Mined coal is brought to the surface by horizontal conveyor belt and is crushed and sized for immediate truck load out. All coal is transported from the mine by truck. Surface storage of coal is not a general practice, largely because stored coal must be loaded by a front end loader. Storage facilities for emergency short term coal storage are, however, provided for occasions when mine production exceeds the available trucking capacity.

There is no existing data on either suspended particulate matter or meteorological parameters besides the general information presented in Exhibit 4.

2. Emission Summary

This summary is based on the information and equations supplied in the Environmental Protection Agency Publication AP42, Part B, Compilation of Air Pollution Emission Factors. All emissions given are the uncontrolled or potential emissions.

Production = 1,650,000 Tons/Year

Dry crushing: The coal material as received from the mine has a significant water content which reduces the emission rate.

Emission Rate 0.1 lbs/Tons Processed

$$1,650,000 \text{ Tons/Year} \times 0.1 \text{ lbs./Ton} \times 1 \text{ Ton}/2,000 \text{ lbs.} \\ = 82.5 \text{ Tons/Year}$$

Fugitive Dust Emissions: Based on 80% of the ground cover passing a 200 mesh sieve, a one-quarter mile round trip loading circuit and 60 annual days of rainfall exceeding 0.1 inches.

$$E = (.81(80)) \times (5/30) \times \left(\frac{365-60}{365} \right) = 9.02 \text{ lbs/vehicle mile} \\ 9.02 \text{ lbs/vehicle mile} \times 269 \text{ trips/day} \times 350 \\ \text{days} \times .25 \text{ miles/trip} \times 1 \text{ ton}/2,000 \text{ lbs} = \\ 106 \text{ tons/year}$$

3. Current State of Compliance

The state of air quality control of the SUFCo mine is generally excellent, except the control of fugitive dust in the product load out area. Watering of this area was practiced in past years, but has been discontinued.

- a. Haul road - The haul road is paved and free of mud and potholes. Access to the road is limited by the surrounding terrain, which leaves it free of carried-on mud or dirt by vehicles. Emissions from the haul road are minimal.

- b. Service area - Fugitive Emissions. The service area is compact and efficient in size and layout. None of the area is paved except the area around the changeroom and in front of the shop. Traffic to and from the mine is limited by the small parking area available (approximately 20 car capacity). Personnel are transported to and from the work site by company bus and van pools. Dust emissions caused by personnel and mining support operations are minimal in spite of the partially unpaved parking area. The SUFCo mine currently employs approximately 250 people. Based on an average round trip of 42 miles per day, 3.5 million miles of personal car transportation is saved annually by the use of company transportation. This represents an extremely significant limitation of vehicular emissions. Coal load out operations are the cause of most of fugitive dust emissions. Because of the area layout, trucks are routed near to the emergency coal storage area. Because stored material must be loaded with a front end loader, physical separation of the driveway and the storage area is difficult. During those periods when no coal is stored, trucks encroach upon the coal ground tailings and scatter them over the entire area. The result is a thin layer of repeatedly pulverized coal dust in the load out area. Fugitive dust emissions from the load out area are moderate. Control of this emission source will be re-established through regular water applications. The area is entirely within the collection system for the sediment pond.
- c. Coal crushing and conveying - All crushing is conducted in closed areas. Conveyor belts are covered, as are all lifts and drop points. Fugitive emissions observed are extremely low. The low emissions were evidenced even during winds of approximately 15 miles per hour. The extremely good dust control in this area is attributed to the excellent condition of covers and seals and to the relatively high water content of the product.
- d. Truck loading - Loading is primarily accomplished by dropping the product from a bin-hopper into the haul trucks. Drop points are well protected from the prevailing wind directions. Loading is accomplished almost immediately after the product is removed from the mine and the water content of the product is assumed responsible for severely limiting dust emissions. Loading of temporarily stored material by front end loader results in significantly increased fugitive emissions.

The limited use of this method of loading allows discounting its overall contribution.

4. Recommended Air Monitoring Program

No site specific data regarding air quality or meteorology is presently available. The surrounding terrain indicates that the mine site would be unique in its meteorology. Existing modeling programs coupled with emission estimates would reveal little information of value regarding the current ambient levels of suspended particulate matter. It is therefore planned that wind speed, wind direction, rainfall and suspended particulate matter will be monitored for one year as proposed below. Subsequent to this monitoring program, Southern Utah Fuel Company will review the results with the appropriate regulatory authority and act on their recommended changes to the program.

- a. Meteorology - Measurement of wind speed, wind direction and rainfall will be accomplished on a continuous basis using a remote sensing device located at a level approximately ten meters above and in the center of the service site. Recording equipment will be situated in a suitable location in the office complex. Experience indicates that the Climatronics Mark III System with a threshold of 0.75 mph is excellent for the intended purpose. This system is available through Climatronics Corporation, 1324 Motor Parkway, Hauppauge, New York 11787. Numerous other companies supply equivalent systems.
- b. Suspended particulate matter (TSP) - The only air pollutant generated by the existing or projected mining operations which is available in sufficient quantities to require monitoring is TSP. Careful examination of the mine site indicates that little of the suspended coal dust escapes the fifteen acre mine site area. Based on inspection, coal dust deposition indicated that local interpretation of wind direction and speed are essentially valid. Indications are that the wind blows strongly to the northeast up the larger of the three terminal canyons and softly to the southwest down the main canyon. Deposition of fugitive coal dust indicates that heaviest concentrations are to be found in the southwest direction. Review of meteorological data after the first year of data collection will indicate if indeed this site is the point of highest

ambient particulate concentration. The decision to continue particulate monitoring efforts beyond the proposed one year period should be dictated by the measured levels of suspended particulate and meteorological findings.

N. FINAL RECLAMATION

CROSS REFERENCE:

Items 4, 5, 8 of Donald A. Crane, OSM, March 16, 1979, correspondence to Utah Division of Oil, Gas, and Mining. (Exhibit 1)

February 12, 1977 SUFCo Mine Plan, as amended.

Drainage Facilities and Sediment Control, Plan Merrick and Company, 1979. (Exhibit 9)

Final Reclamation Contours Plan Map, September 22, 1979, Southern Utah Fuel Company. (Exhibit 11)

The approximate final reclamation contours and cross-sections are shown on drawings included in this 1979 Addendum submittal. The proposed program will consist of:

1. Removal of Structures - present buildings, walls, culverts, pipes, utilities, and coal handling structures will be razed and removed from the canyon. Any structures which cannot be sold will be buried in either a private or municipal sanitary landfill. If regrading contours will not interfere, concrete foundations will be buried on site.
2. Excavation and filling to approximate original contour. Only the present fill will provide material which will be used to reduce the slope of present cut faces and the fill face. It will be emplaced in compacted lifts using heavy construction equipment. Particular attention to surface drainage and slope stability will be given to the program to prevent subsequent erosion and slumping. The final proposed contour is illustrated in Exhibit 11.
3. Establishment of Drainage Channels. The East Spring Canyon water course will be established in a "V" shaped channel through the recontoured fill area. The channel will be rip-rapped and anchored with rocks and boulders

obtained on site. Riffle berms will be installed every fifty feet across the flow direction to disperse the hydraulic energy over the entire channel length.

4. Topsoil replacement. No topsoil storage piles are presently on the permit area. Topsoil stored subsequent to approval to construct the sediment control structures will be spread as evenly as possible over the regraded areas to a one inch minimum depth.
5. Revegetation. The entire area disturbed due to the regrading process will be revegetated through hydroseeding. The mixture and application rate will be:

2000 lbs. of mulch per acre
100 lbs. of nitrogen per acre
50 lbs. of phosphorus per acre

The seed mixture will be as follows:

Browse

Saltbrush, Fourwing	2	lbs./acre
Rose, Woods	1	lb./acre
Mahogany, Mountain	1/2	lb./acre
Skunkbrush	<u>1/2</u>	lb./acre
	4	lbs./acre

Forbes

Sweetvetch, Utah	1	lb./acre
Yellow Sweet Clover	1	lb./acre
Sage, Herbaceous	1/2	lb./acre
Glob Mallow	1/2	lb./acre
Penstemon	<u>1</u>	lb./acre
	4	lbs./acre

Grasses

Spiked Wheat Grass	4	lbs./acre
Indian Rice Grass	3	lbs./acre
Russian Wild Rye	2	lbs./acre
Kentucky Blue Grass	2	lbs./acre
Stiff Haired Wheat Grass	<u>1</u>	lb./acre
	12	lbs./acre

TOTAL SEED PER ACRE IS

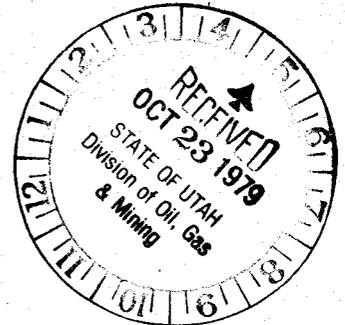
20 lbs.

6. Enclosures. No enclosure fences are planned. Cattle would cross the area via the east-side road twice each year while herded to and from the Old Woman Plateau. Southern Utah Fuel Company will contact the ranchers through the U. S. Forest Service to request their cooperation in keeping the cattle off of the areas as much as possible while herding until the vegetation is established equal to that in surrounding undisturbed areas.



United States Department of the Interior
OFFICE OF SURFACE MINING
Reclamation and Enforcement
POST OFFICE BLDG. RM. 270
1823 STOUT STREET
DENVER, COLORADO 80202

March 16, 1979



Mr. Ron Daniels
Staff Assistant
Division of Oil, Gas & Mining
Department of Natural Resources
1588 West North Temple
Salt Lake City, UT 84116

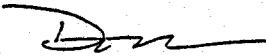
Dear Ron:

As you know, SUFCO has asked for Federal approval to extend underground works into newly leased Federal lands.

We have made out "completeness" review of the SUFCO mining plan. Attached is a list of the points we believe should be expanded upon to show the operation will comply with reclamation performance.

SUFCO is getting a copy of this letter and the attachment. Please contact John Hardaway or Murray Smith if you have questions.

Sincerely,


Donald A. Crane
Regional Director

cc: F. S. Manti LaSalle
F.S. Fishlake N.F.
USGS, Moffitt
USGS, Horn
SUFCo

SUF
ADDITIONAL INFORMATION FOR MINE PLAN

GENERAL INFORMATION

1. Map #1A shows three sets of entries breaking out into North Fork Quitchupah Canyon. The plan should contain a schedule and description of any access road or site construction and surface facilities at the entries or at any other permit locations where future expansion will take place. There should be a discussion of the existing conditions (soils, vegetation, wildlife, archeology, hydrology, etc.) and of reclamation for any new access and site. If there are to be no new sites, the plan should so state.

SIGNS AND MARKERS

1. Sign design and placement should be specified. I.D. signs and topsoil signs will be needed.

LAND USE

1. The land use portion of the plan should give specific information on the grazing carrying capacities, condition of range, forest or range management practices, hunting or recreation use days, timber production, etc. Consideration should be given to different uses or capabilities in stream valleys, steep slopes and flatter mesa top areas. The section should address capabilities of land for uses beyond those presently in effect.

BACKFILLING AND GRADING ROAD CUTS, ETC.

1. The plan states that roads may or may not be reclaimed depending on Forest Service needs. There is no detail on which roads, or how roads would be reclaimed. There should be a commitment to a road abandonment plan which tells how road cuts would be backfilled, how roads would be graded or otherwise abandoned, stabilized and revegetated. Roads to be affected should be shown on a map. The plan should show how the abandoned road area will blend into the abandoned tipple site fill area.

2. There should be a contour map to show the proposed final surface configuration upon abandonment of the cut and fill area at the tipple site. The map should show how cut or fill contours would match with undisturbed surface contours. There should be an illustration of the reclaimed tipple surface area with and without road abandonment, if there would be differences.

DISPOSAL OF SPOIL AND WASTE MATERIAL

1. The plan should include description, and chemical and physical analysis of the mine waste material to show its potential for polluting water by leaching, for forming stable fills, and for supportive revegetation.

2. The February 5, 1979, mine plan addendum proposes a combination waste disposal fill-sediment pond, with a dam constructed of waste. 30 CFR 717.18 requires detailed design, construction and maintenance factors for dams constructed of waste materials. The mine plan must show that each requirement of 30 CFR 717.18 will be met.

3. If the new waste disposal area is to be reclaimed separately from the larger fill, there should be a separate discussion of reclamation.

WATER QUALITY

1. The plan does not show that all surface drainage from the disturbed area will pass through the sediment trap on top of the fill or through the proposed sediment pond. The showing should be made with contour maps which give location of all diversion structures.

SURFACE WATER MONITORING

1. The plan should explain the type of analytical quality control system to be utilized.
2. Manganese should be added to the routine analyses list, (Table 10 of the Hydrology report).
3. Monitoring reports should be submitted within 60 days of sample collection.
4. Sediment control pond discharges should be added to the monitoring schedule.
5. Results of monitoring to date should be submitted to OSM, to aid in plan analysis.

DIVERSION AND CONVEYANCE OF OVERLAND FLOW

1. The plan should include a map showing all diversion ditches, pipes, culverts or berms. The design criteria and specifications for these structures should be included in the plan (include cross sections). Diversions should be identified as temporary or permanent. Restoration practices should be specified or there should be justification for permanent diversions. The proposed final reestablished channel through the present fill area is a permanent diversion and must be designed accordingly.

DISCHARGE STRUCTURES

1. Specifications for discharge control energy dissipaters should be provided for diversions.

GROUND WATER SYSTEMS

1. The hydrology report indicated that another survey of springs and seeps would be conducted in the spring of 1978. Results of the survey should be submitted.
2. The plan indicates the company obtains water from the alluvium in Quitchupah Creek at one point and discharges waste water at another point downstream. Both operations should be described in more detail. Is there a permit for the discharge? If not, a permit must be obtained.

HYDROLOGIC IMPACT OF ROADS

1. A general drainage plan for roads should be provided. The plan should include maps and cross sections to show road locations, grades, drainage structures, general design, materials, etc. Road maintenance procedures should be described.

SOILS

1. The plan should include soils maps for the presently disturbed areas (including immediately adjacent areas and for areas to be disturbed by actual surface operations exclusive of subsidence). Topsoil amounts, characteristics, reclamation suitability, handling storage and reuse should be discussed. What type of material and how much will be used to final surface the present tipple site? Where will the material come from?

VEGETATION

1. SUFCO's vegetation map was referred to in the text, but not included. Copies should be submitted.

WILDLIFE

1. There should be a more detailed description of plans to protect wildlife during and after operations by controlling and posting speed limits, limiting night time coal haulage, preventing stream degradation, controlling access, revegetation, reporting sitings and effects on rare and endangered eagles, restricting seasonal use of areas of special wildlife value, etc.

DUST CONTROL

1. The plan should describe dust control measures for the tipple, roads, ponds, stock piles and other mine use areas. The plan should describe practices, equipment, chemicals, or other materials, points or application of suppressants, amounts of application, etc. Describe air quality monitoring program.

SOUTHERN UTAH FUEL COMPANY

CONCEPTUAL SKETCH OF AIR INTAKE IN QUITCHUMPAH CANYON

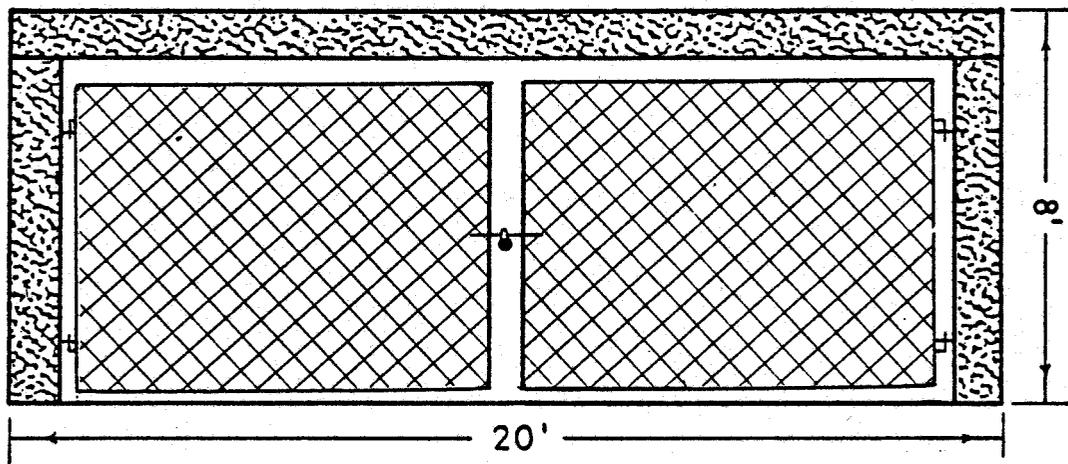
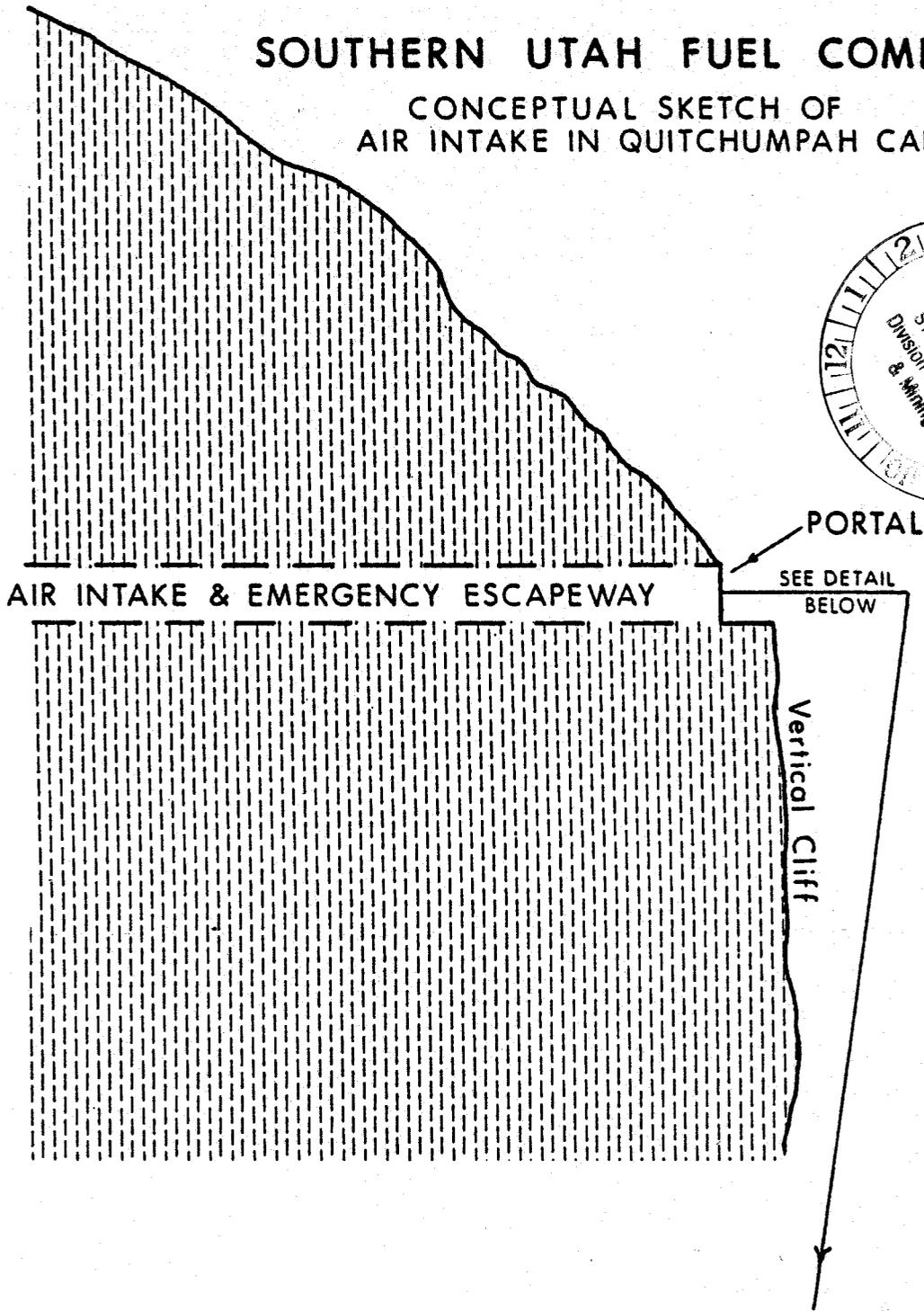
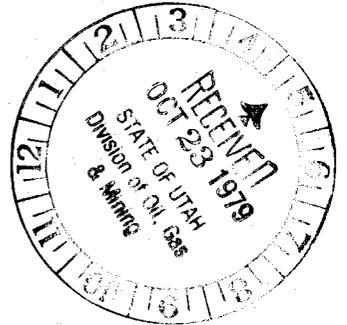


EXHIBIT 2 from Technical Examination for Environmental Analysis,
Coastal States Energy Company, April, 1975.



ENVIRONMENTAL ANALYSIS
FOR
MINING AND RECLAMATION PLAN
SOUTHERN UTAH FUEL COMPANY
SEVIER COUNTY - SALINA, UTAH
COASTAL STATES ENERGY COMPANY, LESSEE

FEDERAL COAL LEASES

SL-062583
U-062453
U-0149084
U-28297

PREPARED BY
RALPH J. BLUMER
MINING ENGINEER

OFFICE OF THE AREA MINING SUPERVISOR
CONSERVATION DIVISION
8426 FEDERAL BUILDING
125 SOUTH STATE STREET
SALT LAKE CITY, UTAH 84138

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INTRODUCTION

The purpose of this analysis is to determine the impact on the environment which could result from underground coal mining operations by Southern Utah Fuel Company on Federal leases U-062453, SL-062583, U-0149084, and U-28297, with Coastal States Energy Company as lessee. This analysis is required by the National Environmental Policy Act of 1969, Section 102 (2)(C).

Lease U-28297 is a coal lease application of Coastal States. The mine plan was prepared to cover all four of the above leases, but if Coastal States is unable to acquire U-28297, there will be no substantial change in the mine plan now proposed for the three leases now held by Coastal States. The impacts resulting from the operations will also not be significantly different if U-28297 cannot be acquired by Coastal States.

A. Proposed Action

(1) General

Southern Utah Fuel Company (SUFCo), a subsidiary of Coastal States Energy Company (C.S.), of Houston, Texas, submitted a mining and reclamation plan on January 17, 1977, to the Area Mining Supervisor. The purpose of the plan is to comply with the requirements of 30 CFR 211 (May 17, 1976). It also covers the expansion of the existing mines into Federal lease U-28297. U-28297 is an open Federal lease which was applied for under the short term criteria .

This plan covers Federal leases SL-062583, U-062453, U-0149084, and U-28297. The surface values of these leases are administered by the U.S. Forest Service and the BLM. The lease descriptions are as follows:

SL-062583	<u>T. 21 S., R. 4 E., SLM, Sevier County, Utah</u> S $\frac{1}{2}$, Section 36	
	<u>T. 21 S., R. 5 E., SLM, Sevier County, Utah</u> Section 31	
	<u>T. 22 S., R. 4 E., SLM, Sevier County, Utah</u> Lots 1, 2, 3, & 4, S $\frac{1}{2}$ N $\frac{1}{2}$, and S $\frac{1}{2}$, Section 1 NW $\frac{1}{4}$, Section 12	
	<u>T. 22 S., R. 5 E., SLM, Sevier County, Utah</u> Section 6	
	N $\frac{1}{2}$ NE $\frac{1}{4}$ and E $\frac{1}{2}$ NW $\frac{1}{4}$, Section 7	<u>2,202.77 acres</u>
U-0149084	<u>T. 22 S., R. 5 E., SLM, Sevier County, Utah</u> NE $\frac{1}{4}$ and N $\frac{1}{2}$ SE $\frac{1}{4}$, Section 12	<u>240.00 acres</u>

U-062453

T. 21 S., R. 5 E., SLM, Sevier County, Utah

SW $\frac{1}{4}$ SW $\frac{1}{4}$, Section 28

SE $\frac{1}{4}$ SE $\frac{1}{4}$, Section 29

N $\frac{1}{2}$, Section 30

W $\frac{1}{2}$ NW $\frac{1}{4}$, Section 33

480.00 acres

U-28297

T. 21 S., R. 5 E., SLM, Sevier County, Utah

S $\frac{1}{2}$, Section 32

W $\frac{1}{2}$ SW $\frac{1}{4}$, Section 33

T. 22 S., R. 5 E., SLM, Sevier County, Utah

W $\frac{1}{2}$ W $\frac{1}{2}$, Section 4

Section 5

S $\frac{1}{2}$ and S $\frac{1}{2}$ NE $\frac{1}{4}$, Section 7

Section 8

NE $\frac{1}{4}$ and N $\frac{1}{2}$ NW $\frac{1}{4}$, Section 17

N $\frac{1}{2}$, Section 18

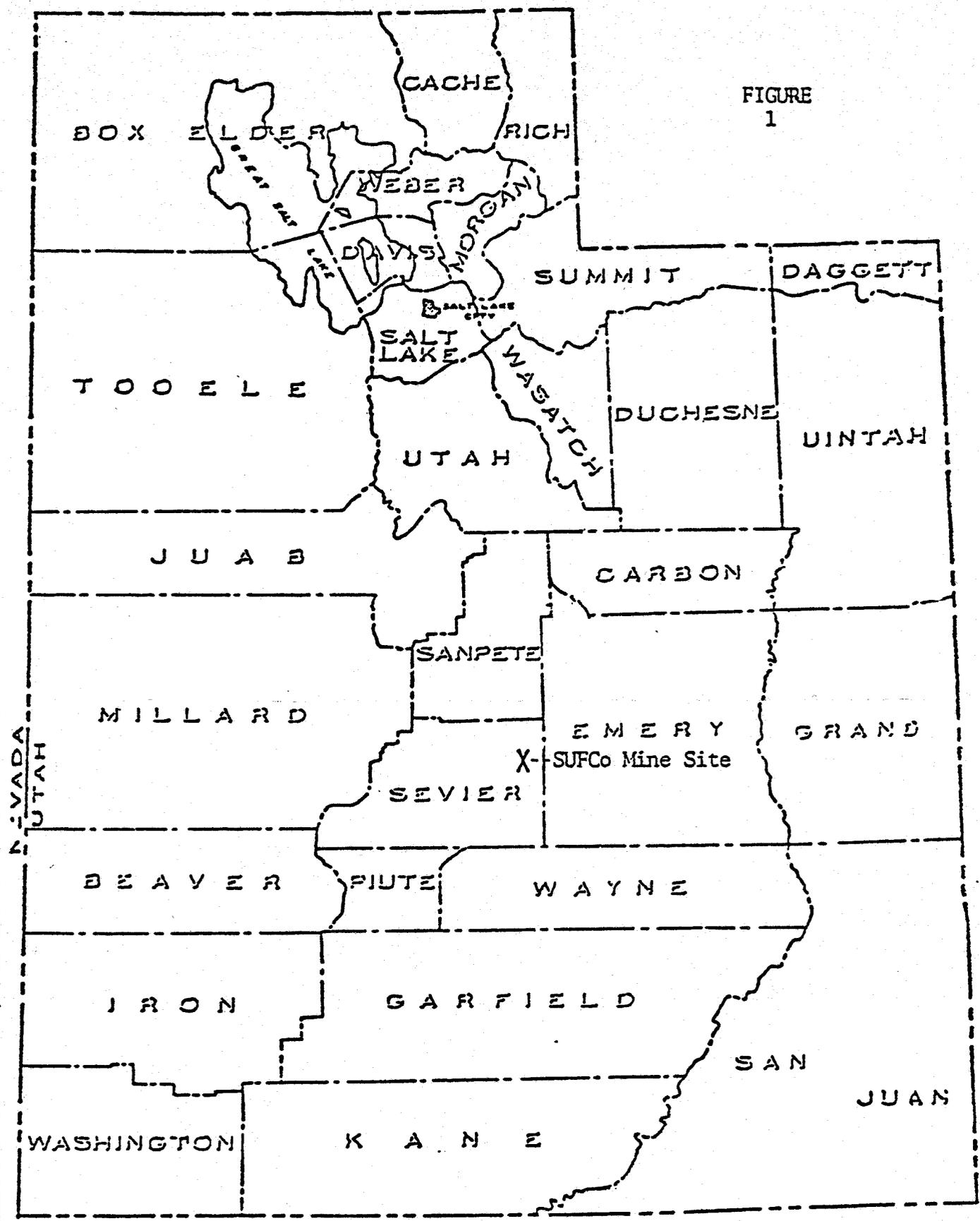
2,631.98 acres

Total Federal land covered by the mining and reclamation plan is 5,554.75 acres. C.S. also hold 640 acres of fee land. See Figure 1, 2, & 3 for the general location and also for location of the Federal and fee land.

SUFCo is currently mining on Federal leases U-0149084 and SL-062583. In 1976, SUFCo mined a little over 1 million tons of coal. By 1981, a production rate of 2.1 million tons per year is projected.

Access to the mines in Convulsion Canyon is via Interstate 70 and an improved gravel road. Approximately 20 miles southeast of Salina you take the 72 Ranch Exit off I-70. It is then another 10 miles to

FIGURE 1



INDEX MAP of UTAH

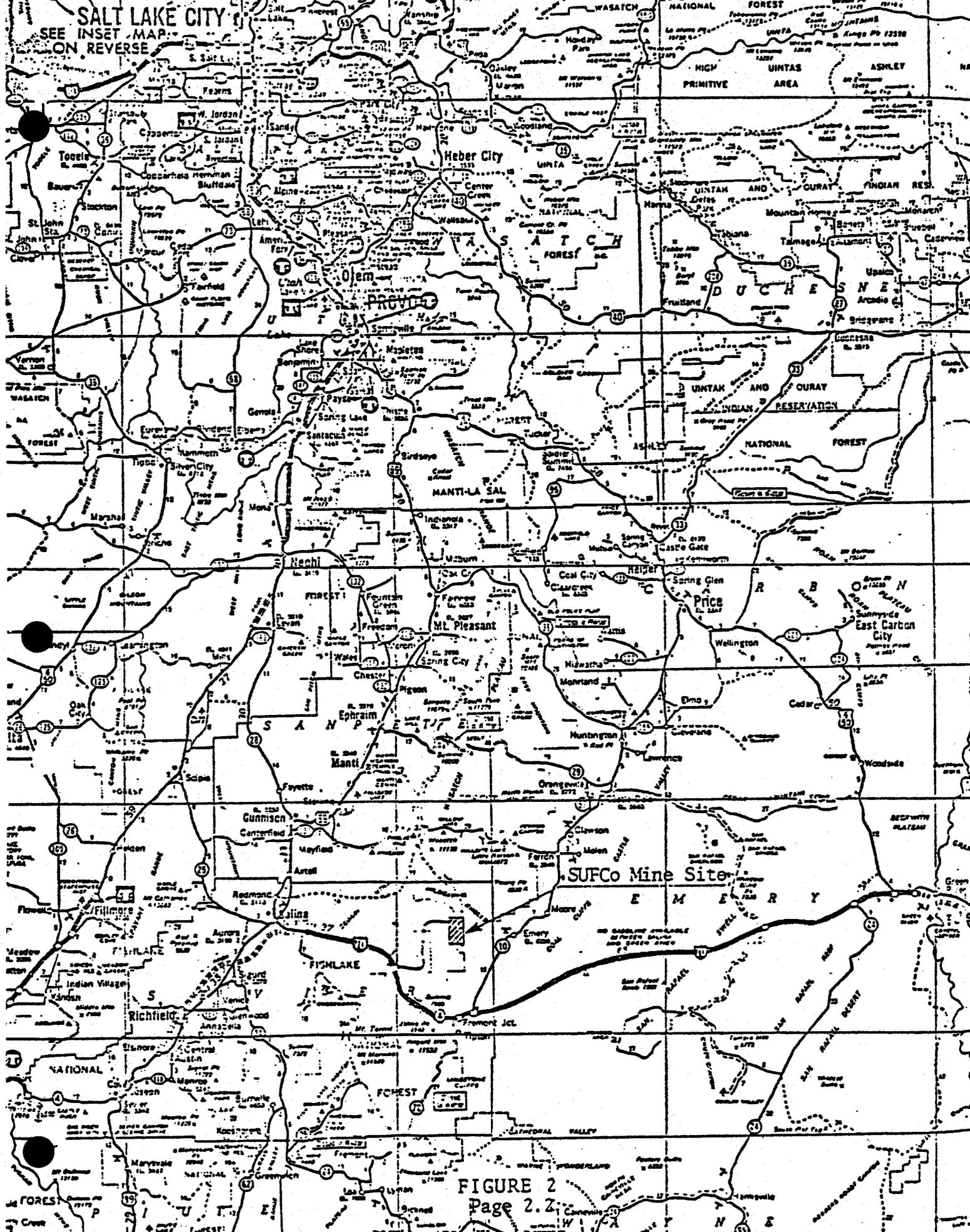


FIGURE 2
Page 2.2

the mine on the gravel road. Negotiations between C.S. and the State are now underway concerning the paving of the road. The gravel road recently has been improved by C.S. at its own expense. It was very narrow and dangerous, but now it provides good passage to Acord Lakes and the mine.

(2) Lease Histories

U-0149084 was issued on June 1, 1966, to SUFCo. It was then assigned to C.S. on November 1, 1974. Mining began on the lease in 1971.

SL-062583 was issued on September 11, 1941, to Lorenzo R. Hansen. This lease was assigned to SUFCo on May 25, 1945. SUFCo then assigned the lease to C.S. on November 1, 1974. Mining was started on the lease in 1942 and has continued up to the present.

U-062453 was issued on March 1, 1962; to the Heiner Coal Company, Equipment Rental Service, and SUFCo, all of which are from Utah. On December 1, 1974, SUFCo assigned its one-third of the lease to C.S. On February 1, 1977, Heiner Coal Company assigned its one-third of the lease to Pacific Gas & Electric Company of California. This lease has never been mined.

C.S. holds a \$25,000 Statewide bond.

(3) Exploration

Exploratory drilling was done in 1974 and 1976 to delineate the coal reserves. It is expected that C.S. will initiate another drilling program in the summer of 1977. Most of this drilling will probably be on U-28297 if C.S. should get the lease. The drilling will help determine the extent of the "burned" area at the coal

outcrop and will also be used to measure the quantity and quality of the coal.

(4) Mining Methods, Sequence, and Recovery Rate

Four mining methods could be used in the coal mining operation depending on the conditions and nature of the coal seam. These methods include: conventional and continuous room and pillar, long-wall, and short-wall mining. Coal is currently being mined by conventional and continuous miner units with room and pillar mining methods.

In both conventional and continuous room and pillar mining, part of the coal bed is removed by driving parallel excavations or rooms. The coal remaining between the rooms becomes the pillar, which is pierced at certain intervals by break-throughs or "cross-cuts" to provide passageways for ventilation.

Openings are developed in a uniform pattern within a panel or block of coal. Remaining columns of coal or pillars are left standing for support of the overlying strata. In conventional, the coal is blasted from the coal face. The broken coal is then gathered by a loading machine which transfers it onto a shuttle car for transportation to a nearby conveyor belt. Continuous room and pillar mining is identical to conventional room and pillar mining except the mining is performed by a single mining machine, the "continuous mining machine." The continuous miner rips the coal loose from the coal face with mechanical cutters and loads the broken material directly into a conveyor belt or shuttle car. After the coal is removed, the roof may be supported by either timber

or steel supports, or more commonly, "roof bolts" which bind the overlying roof rock into a "continuous beam". The pillars may be "pulled" or mined upon completion of mining and the roof allowed to cave.

Longwall mining is a continuous full extraction mining method. The coal is mined in a single cut, no pillars are left, and the overlying strata is permitted or induced to cave once mining is completed. This mining method is particularly applicable when the coal bed is of uniform thickness, contains no hard rock partings which cannot be readily broken by mechanical means, and when roof support or control is very difficult.

The longwall machinery consists of a shearer or plow, a chain-type conveyor, and hydraulically operated self-advancing roof supports (chocks). The coal is cut from the face by the shearer or plow and falls onto the chain conveyor. The chain conveyor moves the coal to a conveyor situated parallel to the long side of the block of coal to be mined, which is usually 500-600 feet wide and 2,500 - 7,500 feet long. Caving of the unsupported roof behind the chocks occurs virtually unhampered and with a high degree of safety.

Shortwall mining is a combination of the continuous mining and the longwall methods. Shortwall mining, as the name implies, is used on smaller coal blocks than longwall mining. The principles of room support and post mining caving are the same as in longwall mining. Actual mining is accomplished by utilizing continuous mining machines and shuttle cars instead of the shearer and chain conveyor.

In areas where the thickness of the coal is non-uniform, long-wall or short-wall methods lose their advantage, and room and pillar methods are employed.

Where the pillars are left standing for support, the method is called "first mining." Pillar size is determined by depth of cover and sized to ensure stability with high recovery. The sequence of mining will include an advancing panel approximately 800 feet across. All entries and crosscuts are driven as mining progresses into the panel.

A retreat first mining method will be used under high cover and poor roof conditions if necessary. The retreat first mining method consists of a panel 800 feet wide where half the panel is mined advancing to the boundary of the panel and second half mined coming out of the panel. Recovery in the panels, based on mining height, is expected to be above 50 percent. Continuous mining units and conventional mining units will be used in first mining.

The mining method called "second mining" is a variation of the room and pillar methods. Three or four entries with connecting crosscuts will be driven to the boundary of the panel, usually 2,500 feet. The entries will then be connected to ventilation openings called "bleeder entries." Mining will then retreat out of the panel, driving rooms 500 feet to the left of the developed entries and robbing the pillars and chain pillars as mining progresses out of the panel. Coal recovery in the panel based on mining height is expected to be above 75 percent. Continuous mining units will be used in second mining.

Maximum extraction could result in surface subsidence over the long term. With the occurrence of mining, in all probability, some surface subsidence would occur. It will depend on the distance from the seam to the surface, the amount of coal removed under the methods of mining, and the stratigraphy of the formations above the coal seams. The fractures associated with the caving will propagate upward until the void left after coal extraction is filled with broken rock. If conditions are unfavorable, the fractures will eventually extend to the surface, causing differential subsidence. Partial extraction methods such as conventional or continuous room and pillar without pillar extraction mining methods would reduce or eliminate surface subsidence. Partial extraction would recover no more than 50 percent of the total in-place coal, and is less desirable from a standpoint of maximum resource recovery:

Mining sequence of the property for the next five years is shown in Figure 4. See Figures 5, 6, 7, 8, and 9 for detailed mining sequence.

Expected production capacity is as follows:

First year -----	1.45 million Tpy - 1977
Mid-second year -----	1.75 million Tpy
Third year -----	1.75 million Tpy
Fourth year -----	2.1 million Tpy
Fifth year -----	2.1 million Tpy

(5) Equipment List

SEQUENCE OF TRAINING
THREE ENTRY CONTINUOUS MINER STEP NO. 1

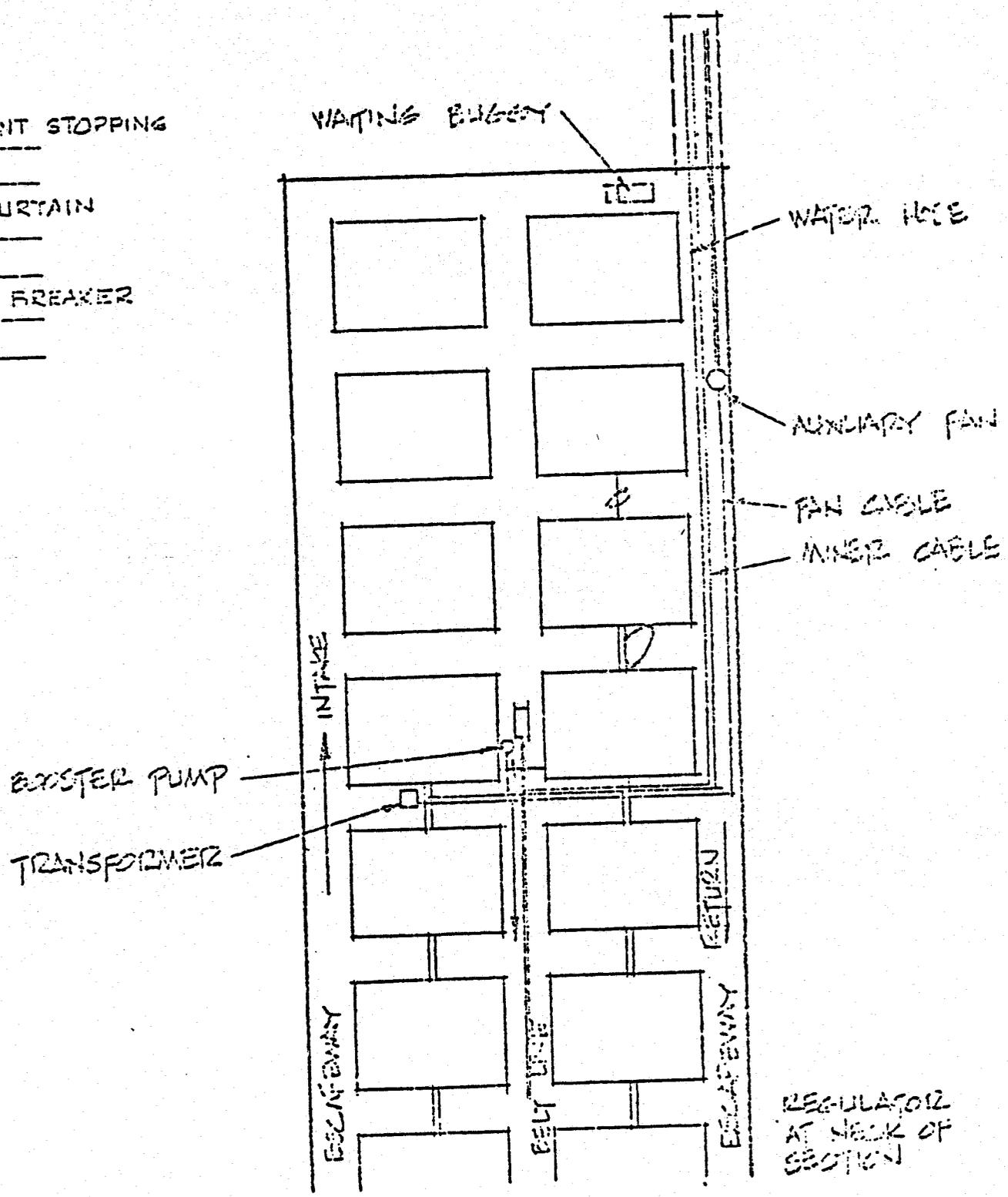
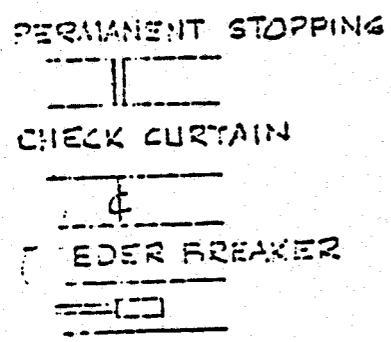


FIGURE 5

SOUTHERN UTAH FUEL
 MINING PLAN
 SCALE 1" = 60' 0"

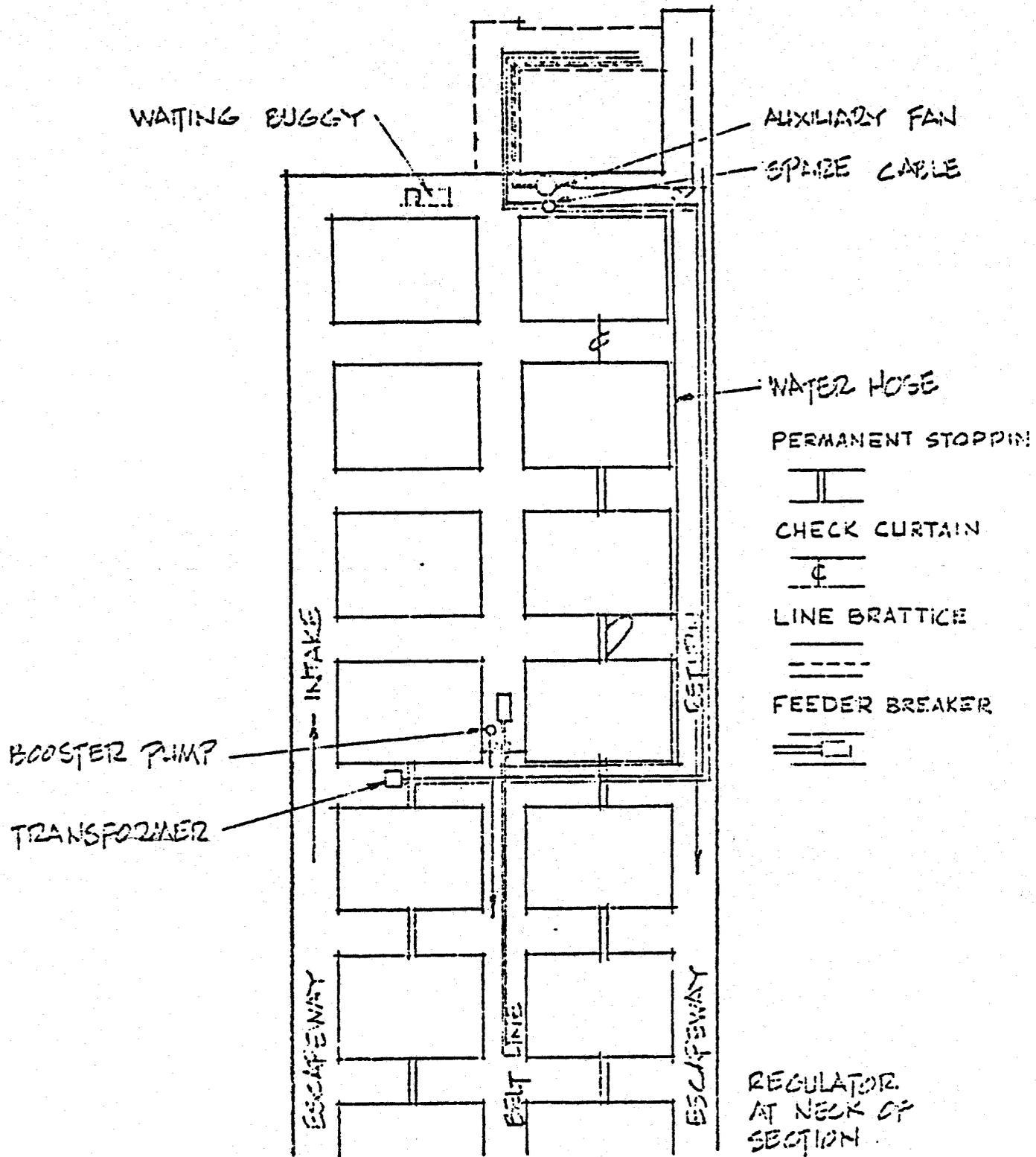


FIGURE 5

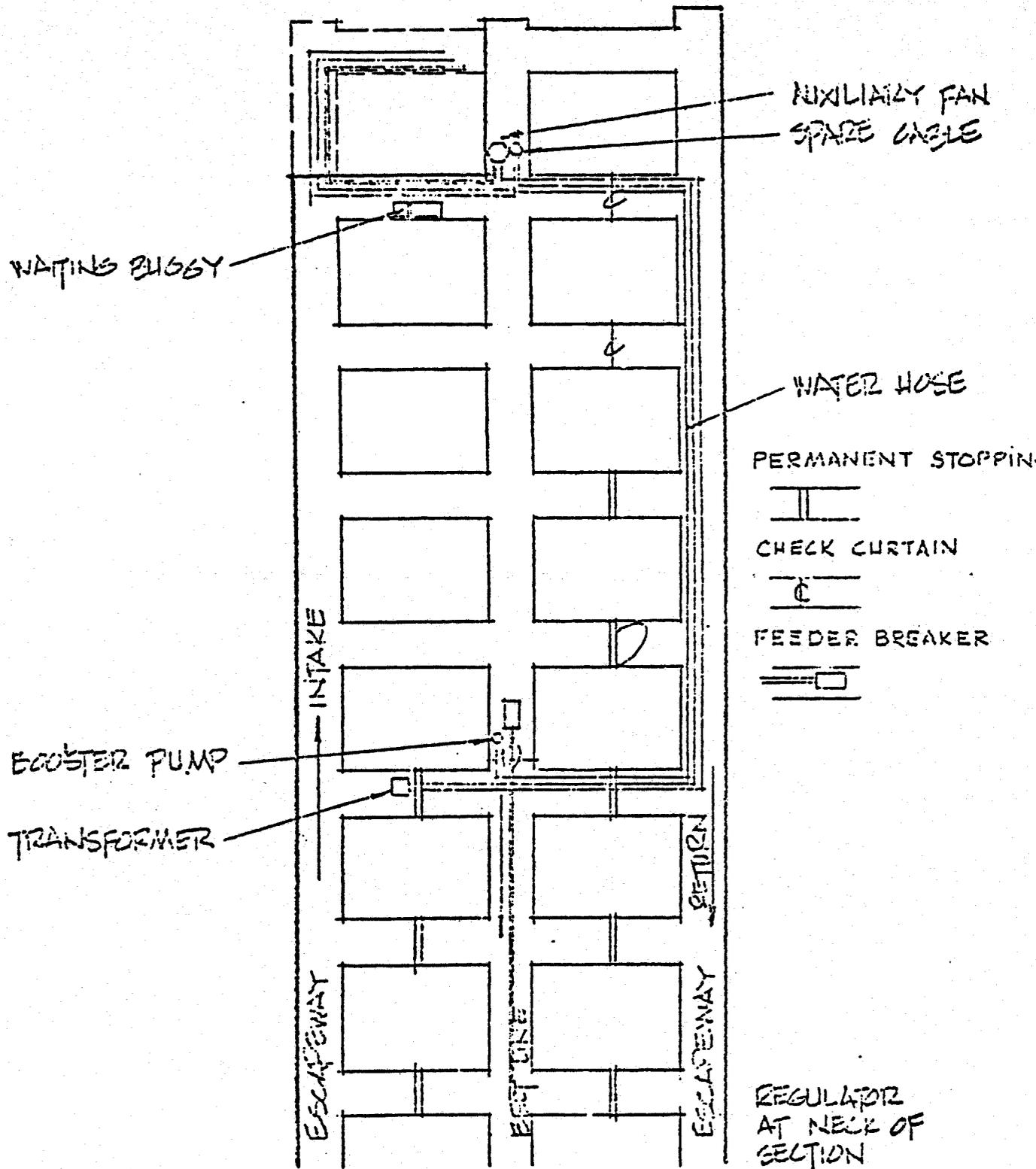


FIGURE 5

SOUTHERN UTAH FUEL
PAGE 7.2c MINING PLAN
1" = 60'-0"

SEQUENCE OF MINING
FOUR ENTRY CONTINUOUS MINER, STEP NO. 1

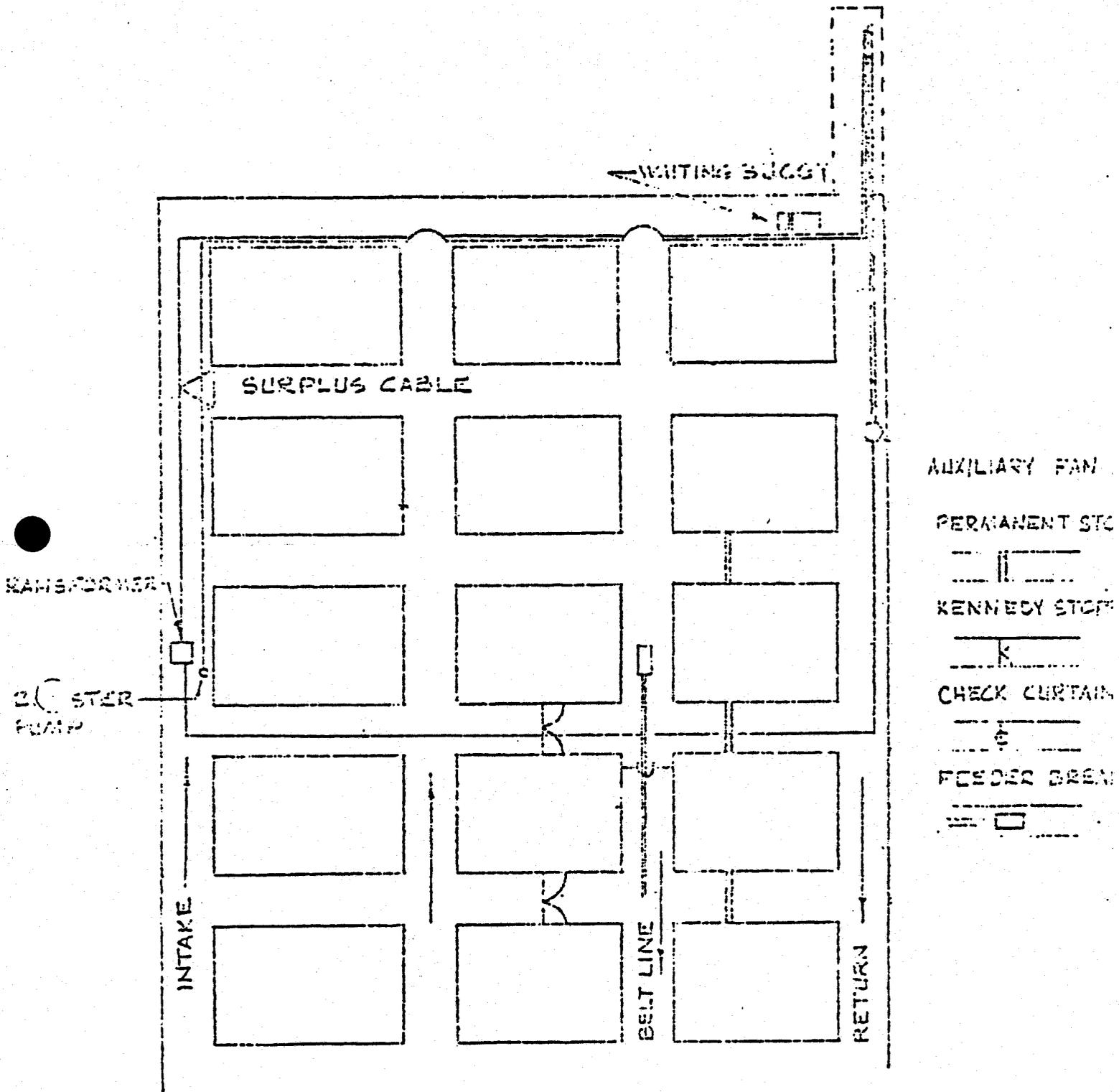


FIGURE 6

SOUTHERN UTAH FLEET
 MINING PLAN
 SCALE 1"=50'-0"

SEQUENCE OF MINING
FOUR ENTRY CONTINUOUS MINER STEP NO 2

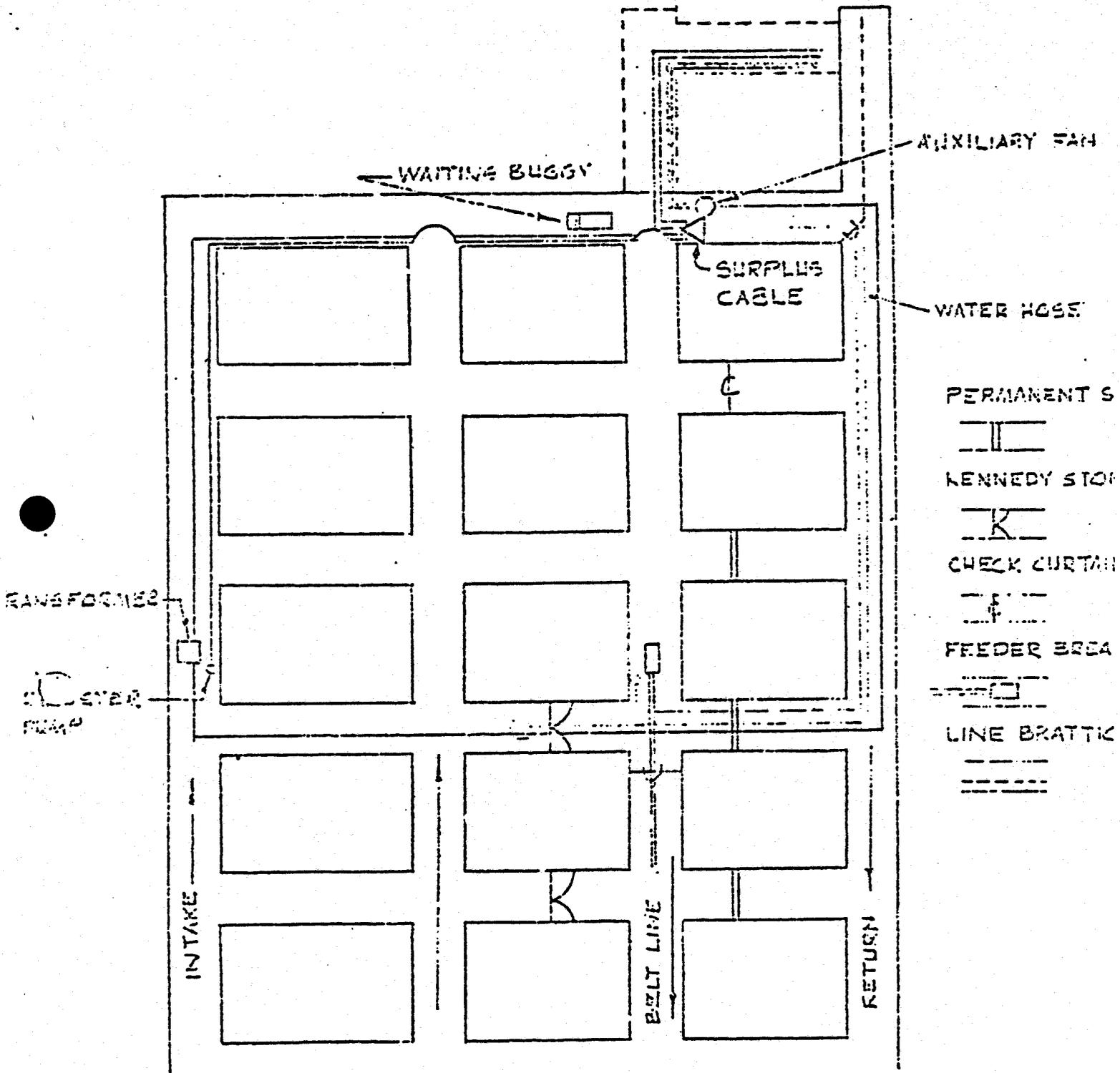


FIGURE 6

SOUTHERN UTAH FUEL &
MINING PLAN
SCALE 1"=50'-0"

SEQUENCE OF MINING
FOUR ENTRY CONTINUOUS MINER STEP NO. 3

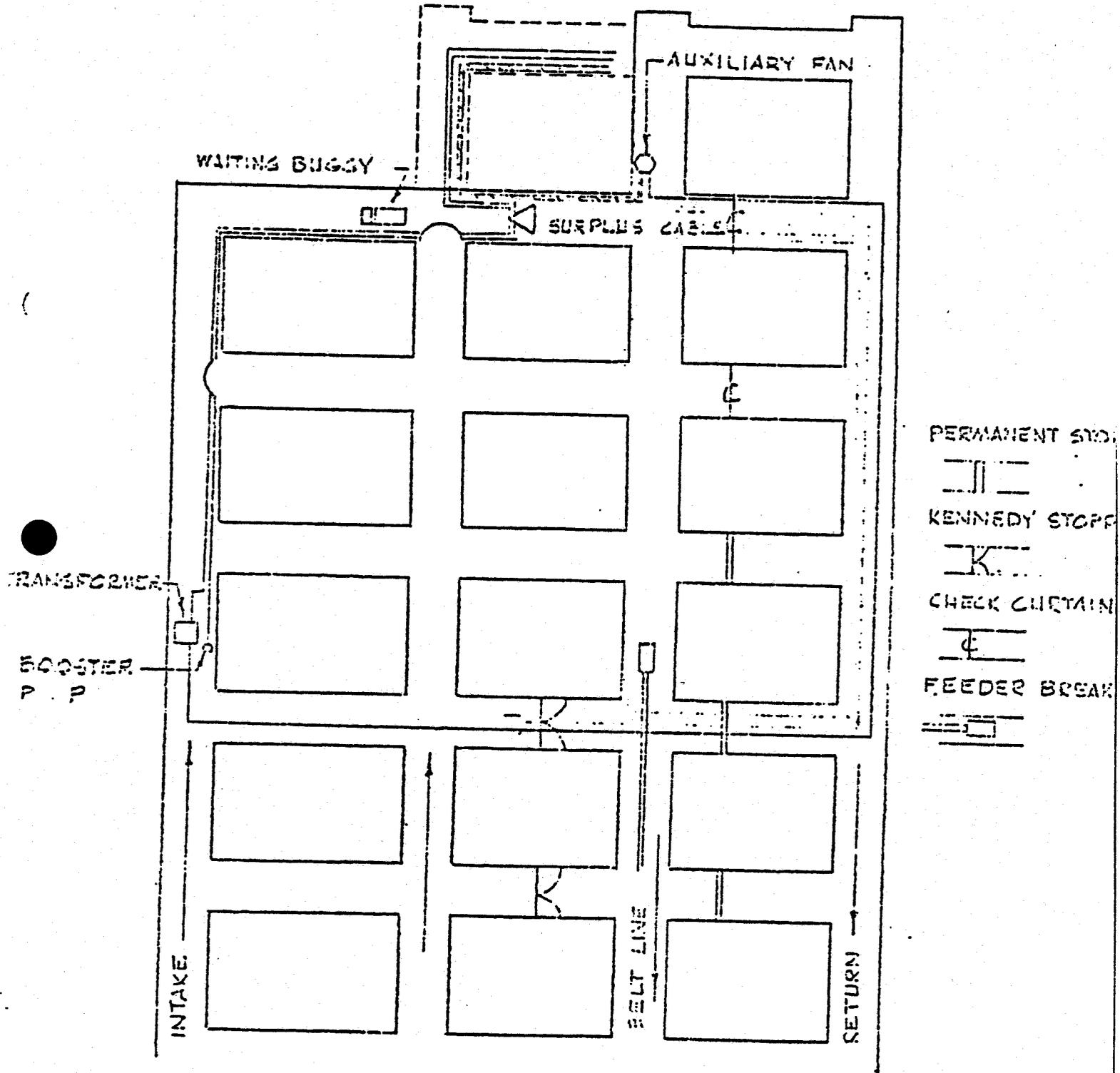
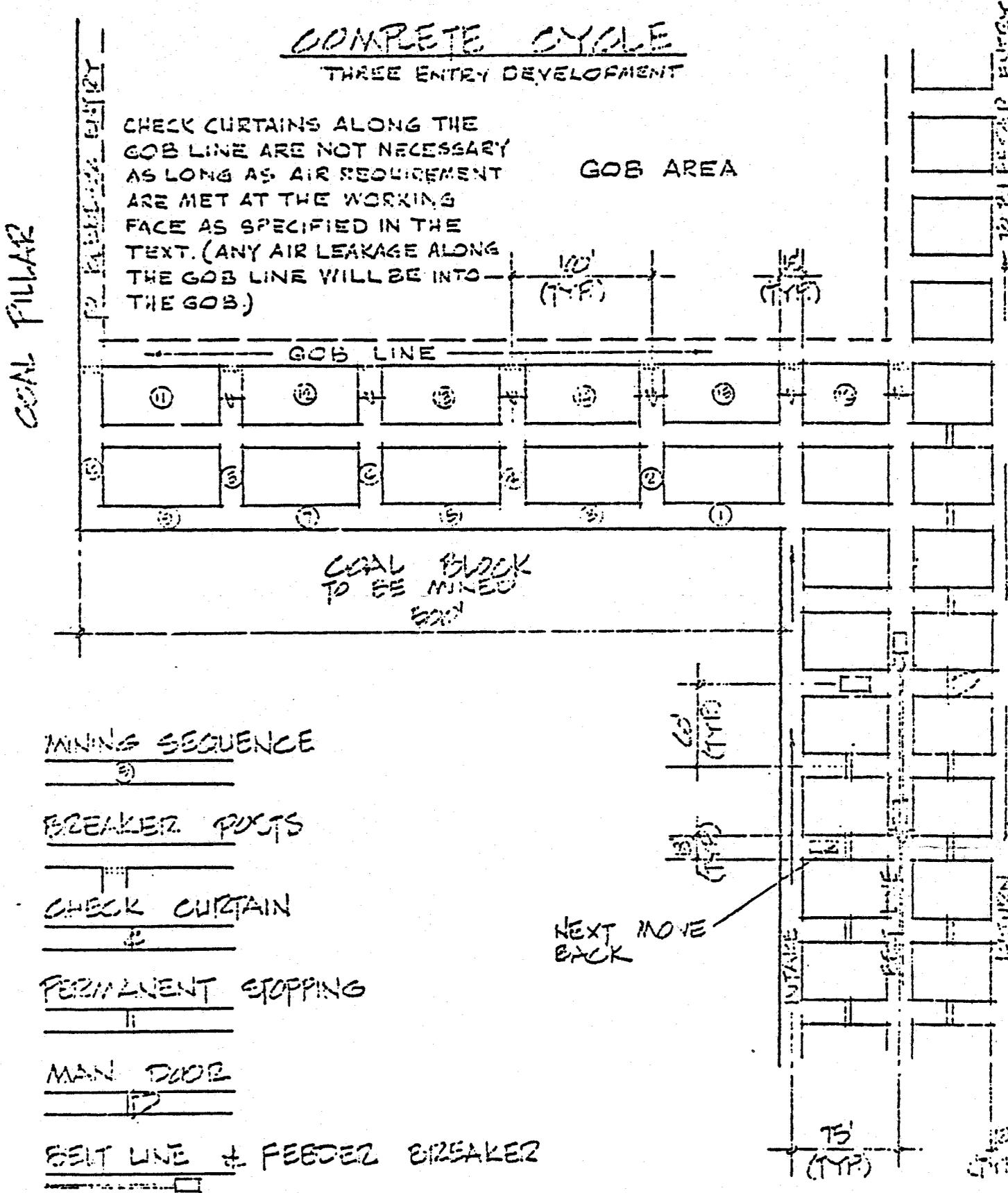


FIGURE 6

PILLAR RECOVERY - CONTINUOUS MINER

MINING SEQUENCE

COMPLETE CYCLE THREE ENTRY DEVELOPMENT



MINING SEQUENCE

BREAKER POSTS

CHECK CURTAIN

PERMANENT STOPPING

MAIN DOOR

BELT LINE & FEEDER BREAKER

FIGURE 7

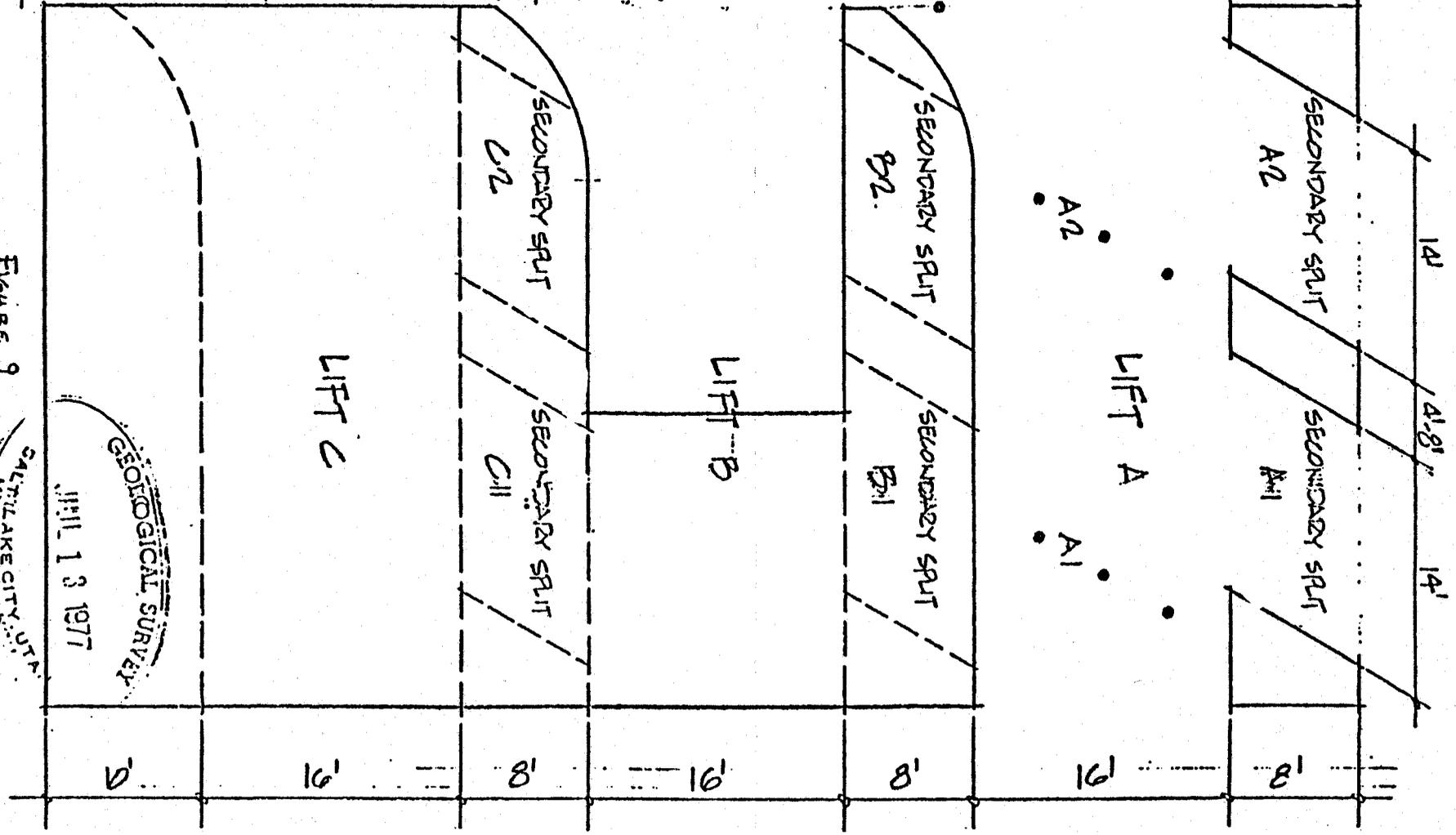
QUAL PILLAR

A MINIMUM OF TWO ROWS OF BREAKER POSTS OR SAFETY JACKS BE INSTALLED ON NOT MORE THAN 4'-0" CENTERS ACROSS EACH OPENING LEADING INTO THE PILLARED AREAS AND SUCH POSTS SHALL BE INSTALLED BEFORE PRODUCTION IS STARTED. SUCH POSTS SHALL BE INSTALLED NEAR THE BREAKLINE BETWEEN THE LIFT BEING STARTED AND THE GOB.

LIFT CUTS IN THE REMAINING PILLARS SHALL NOT EXCEED 16'-0" IN WIDTH. A ROW OF ROADSIDE RADIUS (TURN) POSTS OR THE EQUIVALENT SHALL BE INSTALLED ON NOT MORE THAN 4'-0" CENTERS LEADING INTO SECONDARY SPLITS IN SLABS.

Figure 9
PAGE 7.6

SALT LAKE CITY, UTAH
MINING BRANCH
GEOLOGICAL SURVEY
APRIL 13 1977



METHOD T 1 NO
PILLAR 20' x 40'

LIFT CUTS AND SECONDARY SPLIT ANGLES OF PENETRATION MAY VARY FROM 45° TO 90°.

GOB

Table 1

Equipment List

<u>TYPE OF MACHINERY</u>	<u>MANUFACTURER</u>	<u>MODEL NO.</u>	<u>NO. of MACHINES</u>	<u>SUPPORT or FACE</u>
Cutting machine -----	Joy	15RU	3	F
Continuous miner -----	Lee Norse	HH455	1	F
Continuous miner -----	Jeffrey	120-H2	1	F
Coal drill -----	Long-Airdox	TDF-24	3	F
Roof bolter -----	Lee Norse	TL-43	2	F
Roof bolter -----	Galis	520	1	F
Shuttle car -----	Wagner	MIT-F20-S18	5	F
Front end loader -----	Eimco	915D	7	F
Front end loader -----	Eimco	915E	2	F
Feeder breaker -----	Stamler	14B	4	F
Feeder breaker -----	Long-Airdox	Roscoe II	1	F
Service vehicle -----	Sien	606T	2	F
Service vehicle -----	Sien	603	13	S
Service vehicle -----	Sien	620-E	1	S
Service vehicle -----	Sien	612-E	1	S
Service vehicle -----	Ford	4500	1	S
Service vehicle -----	International	2500	2	S
Compressor -----	Garden-Denver	185 CFM	1	S
Rock duster (Hyd) -----	MSA	400	3	S

(6) Surface Facilities and Power Source

The surface facilities consisting of approximately 10 acres, contains maintenance and supply shops, bathhouses, engineering offices, power substation and switch house, powder house, fuel tanks, coal handling and loading station, and a flood sediment tank. A coal stockpile is also located at the mine, as well as a limited parking area. The fire hazards for the surface facilities are low due to the sparsely vegetated surrounding area. Fire detection and fire fighting equipment are located at the mine. The power for the mine is provided by over-land transmission lines running from Emery. Sanitary wastes are handled by a septic tank-drain field system. See Figure 10 for the surface layout.

(7) Waste and Tailing Disposal.

Waste materials such as powder boxes and old brattice cloth had been dumped over a bank and covered with rock. SUFCo was ordered to stop this practice, and as of March 21, 1977, the waste material was removed to a designated landfill. SUFCo is in the process of designing an incinerator. State and Forest Service permits are required to burn material.

The coal is not washed. As a result, there are no tailings to dispose of. Any waste rock made in the mine will be left in the mine.

(8) Coal Transportation

All of the coal is transported from the mine by truck. The larger share is transferred to rail sidings at Salina and Levan. The coal is hauled by 28-ton semitrailers.

(9) Pollution Control

The mine site is isolated from the drainage of East Spring Canyon by a 72-inch culvert. Precipitation runoff from the ten-acre site is channeled through a sediment tank to remove oil, grease, and coal fines before discharge into the canyon. The main culvert will remain functional after mining and site restoration to control erosion.

The mine is currently making more water than it uses. The excess water is pumped to a storage tank for discharge. Some water from the storage tank is used for road watering purposes. Before the water is pumped to the tank, it is collected in the mine. Here the suspended particles are allowed to settle out.

SUFCo discharges the excess water under authority of a National Pollution Discharge Elimination System Permit No. UT0022918.

This permit requires monthly sample monitoring of the mine water discharge. One point source discharge has been identified as the ancillary plant discharge. The sedimentation tank has been constructed to achieve compliance with the effluent limitations specified for this discharge.

The gravel road to the mine is periodically watered to keep down fugitive dust.

The diesel equipment used in the mine are equipped with scrubbers to clean the exhaust. This cuts down the pollutants emitted by the mines ventilation system.

The cutting machines, coal drills, roof bolters, and continuous miners are equipped with water sprays to hold down fugitive dust. Water sprays are also located on all feeder breakers and belt heads. The water sprays in addition to rock dusting helps retain the dust in the mine rather than exhausting it into the atmosphere. The conveyor belts outside the mine are covered to hold down the dust.

(10) Reclamation and Abandonment

Construction of the surface facilities started in 1941, with an expansion taking place recently. Some regrading and road work is currently underway. When this is completed, the slopes below the access road will be mulched and seeded. The topsoil removed during the initial construction of the surface facilities will be used as fill along with the cut material.

Immediately upon completion of mining, all lands disturbed by the surface facilities (10 acres) will be reclaimed diligently until completion. Drainage structures will be plugged or removed and rap-rapped channels constructed to control erosion. Steel and wood

structures not appurtenant to drainage of the area will be removed within 12 months time. Portals will be closed within the first three months. Site will be scarified, sloped, and seeded before the next growing season. Grass will be maintained by fertilization or reseeding until stable up to five years.

The closure of the portals will follow USGS requirements which will be dependent upon the situation at the mine at the time of its abandonment.

Concrete foundations will be buried with fill material and covered with topsoil and disced.

Entire site will be reseeded with a mixture of seed such as mountain varieties of wheatgrass, hard fescue, and Ladak alfalfa, or as specified by the Forest Service.

Seed will be planted using a tractor and drill or hand spreader and rake, at the rate of 15 pounds per acre.

About 1,000 feet of road exists on the lease at the mine. The company does not plan on closing the road or revegetating it since it could be used for livestock driving and fighting forest fires. At the time of abandonment, the road will be closed off if the F.S. so wishes.

Site restoration is not an on-going reclamation process as in surface mining, but a one-time terminal phase. Consequently, this reclamation is not located as an integral part of operations with cost allocation, but rather an obligation which the company is committed to perform as contemporaneously as practical. Costs are not broken down per acre or by function (backfilling, grading, etc.) since the project will be done on a small scale with the same operator performing all functions at once. Overall cost of the site reclamation for

grading and seeding is estimated at \$2,000/acre. Cost of dismantling and removing structures will be reclaimed in salvage of the same.

(11) Water Uses

Currently, water is being pumped from the active workings at the rate that the water is seeping from the active workings. This rate is an average of about 114,000 gallons per day.

Of this flow, about 4,000 gallons per day are used for sanitary purposes at the surface installation at the portal.

During the summer months, about 94,000 gallons of this water is used to wet down the haulage road to Interstate 70 to eliminate fugitive dust.

During six to nine dry frost-free months, the effluent flow which is discharged into East Spring is about 46,000 gallons per day.

Mine seepage -----	144,000 gallons per day
Sanitary water use -----	4,000 gallons per day
Sprinkling -----	94,000 gallons per day
Balance as effluent -----	46,000 gallons per day

During the winter and freezing months when no sprinkling is utilized, the effluent is an average of about 140,000 gallons per day.

The water used in the mine is not included in the above calculations. The quantity of water used by the equipment is substantial. It can be assumed that this water leaves the mine with the coal rather than recirculating.

The water used by the equipment is collected in the mine and pumped to the equipment. The estimated consumption for the equipment is as follows:

(4 Mining Machines) (20 gal*/operating min.) (3 operating hr/shift) (2 shifts / day) (60 min./hour) = 28,800 gallons/day.

*Rate includes allowances for conveyor and haulage system as well as roof bolters and other related equipment.

(12) Action Required

(a) State

SUFCo must submit a notice of intention by July 1, 1977, pursuant to section 26 of the Utah Mined Land Reclamation Act of 1975. This action is unrelated to any action required for the approval of this mine plan.

The division shall review the notice, which includes mining and reclamation plans, and shall make a decision as to the adequacy of the proposal. See Appendix 2 for State letter.

(b) Federal

All mining and reclamation plans and exploration plans will be reviewed and approved, if adequate, by the Area Mining Supervisor after completion of the following:

- (1) An Environmental Analysis as required by the EPA of 1969
- (2) An on-site inspection by the USGS and the surface management agency
- (3) Archeological report
- (4) Concurrence by the surface management agency

Any surface disturbance for roads and facilities shall follow the same procedures as outlined for exploration.

Changes in mining plans shall be approved by the Area Mining Supervisor.

B. Environmental Considerations of the Proposed Action

(1) Geology

See Alvord's Report, Appendix 1.b.

(2) Soils

The soils above the mine on the plateau are generally very shallow, sand to silty sand in texture, and with high percolation rates. The rock showing at the surface is alternating layers of sandstone and shale. In places there are small amounts of coal and limestone.

In the lower elevations east of the mine, the valley of Quitchupah Creek becomes transitional with the gently sloping broad topography of the open plains. This surface is interrupted from place to place by intermittent drainages and resistant knolls of Cretaceous sediments. Soils in this area are derived from the underlying Musak (Mancos) Shale and from colluvium and alluvium derived from the older sediments which were eroded and transported from the highlands to the north and west. Where small patches of land have been cultivated and irrigated, the soils have been derived from the Musak Shale. As is typical of the soils derived from the Mancos, they contain considerable amounts of salts and gypsum and are inherently saline. The soils are sandy and clayey loams and are underlain by alluvial gravels at depths of from 8 to 10 feet. These soils are well-drained.

The main impact to the soils will be as a result of wind and water erosion on the areas disturbed by the surface facilities and road construction. Additional erosion may result from the rechannalization of some drainages. These impacts should be minimal if the mining and reclamation plans are followed.

It is expected that subsidence will have only minor adverse affects on the soil. Mining will be restricted under canyon rims which will reduce subsidence to a minimum. This should cause no change in the present drainage. Any change in topography as a result of subsidence will be gradual and will not result in any substantial rapid change in the drainage, keeping erosion to a minimum.

(3) Air

(a) Meteorology

There is an average frost free period of 80 to 100 days. Temperatures range from 12 to 90 degrees F. The area is characterized by high intensity thunderstorms and associated high winds. Annual precipitation is 12 to 16 inches, the majority occurring from July through October. Monthly average precipitation varies from 0.4 inches to slightly over one inch.

Monthly "Thirty Year Normal" temperatures and precipitation from the nearest weather substation are shown on Table 2. The nearest wind reporting weather stations, Greenville and Hanksville, are not representative of this area due to distance, elevation, and terrain differences. Prevailing winds are basically up-canyon from SSW to NNE

YEAR NORMAL TEMPERATURES AND PRECIPITATION

Table 2

Emery, Utah Weather Substation
Thirty Year Normal

	<u>TEMP.</u>	<u>PREC.</u>
January -----	24.3°F.	.47 inch
February -----	29.0	.51
March -----	35.7	.45
April -----	44.7	.43
May -----	53.5	.62
June -----	61.1	.69
July -----	68.3	.71
August -----	66.1	1.17
September -----	58.7	.79
October -----	58.5	.85
November -----	35.4	.40
December -----	27.2	.57
<u>Total -----</u>		<u>7.55</u>
Annual Mean Average -----	46.0	

(b) Air Quality

On the site, air quality appears to be high. The limited air pollutants at present results from the occasional bike, pickup, truck, or snowmobile use quickly dissipates. Because there are no quantitative data available concerning air quality and noise levels, it is difficult to determine exactly the amount of intensity of any impact that would be associated with the proposed development of the mine. It can be assumed, however, that air quality would be affected and the noise level would be increased an unknown amount. Construction of facilities and roads would result in temporary dust pollution and noise pollution, resulting from the use of heavy equipment and vehicular traffic.

Off-site air in the vicinity of Convulsion Canyon Road and the mine loading area is presently being polluted by moderate

amounts of dust, engine emissions, and noise. The proposal will have the effect of extending the current levels of pollution over about five more years or increasing the current levels by 30 to 50 percent for up to 15 years.

Individual mines generally contribute little to air quality degradation and noise pollution. In view of the intensive mining, the Book Cliffs, Mt. Pleasant, and Wasatch Plateau Fields are expected to receive in the future, cumulative impacts involving air quality and noise pollution may become significant. Air quality is regulated by the Clean Air Act of 1970, Federal regulations, and State laws and regulations.

Noise resulting from the construction activities, and operation of equipment and other human activities such as drilling activities and increased vehicular traffic, will change the relative sense of isolation.

SUFCo is planning on paving the road from I-70 to the mine. This will lower the amount of dust pollution. This road is an open country road. Consequently the amount of dust pollution by the private sector will also be reduced.

(4) Water

See Don Price's Report, Appendix 1.c.

(5) Land Use

(a) Existing Land Use

The current land use for the leases and the immediate area is primarily grazing, recreation, logging, and mining.

The leases are located on the Quitchupah pasture of the Quitchupah C and H allotment. The allotment is presently managed under an intensive rotation management system. Several ranchers in Emery, Utah, are dependent on the allotment. Structural range improvements include one watering trough on the leases and two cattle guards on the access route into the leases. Water in the trough is supplied by a spring.

The mining activities should have little affect on grazing. The only activity which will occur in the same area as the grazing is exploratory drilling. The drilling is confined to small areas, consequently, little vegetation is disturbed. The increase in traffic resulting from the drilling could result in accidents involving the vehicles and cattle. There is the possibility that subsidence and the disruption of aquifers could result in the drying up of the cattle's water supply. Subsidence should be gradual and in itself should have little if any effect on the grazing.

Recreation is primarily big game hunting. It is heavy occurring over a months period of time each year. Some snowmobiling also occurs.

The dispersed types of recreation use in the area has occurred in the presence of the existing mining activity. Considering the recreational opportunities that the area provides and the limited extent of surface development proposed, no serious conflict or impact

is expected to result from these activities. However, the population increase in the region produced by the total coal development will place a substantial added burden of use on recreation areas and facilities throughout the region.

The timber on the leases is open grown Ponderosa pine. All commercial stands occur on the benches. Trees are of low quality because of the poor tree growing site. Cutting is limited to older over mature trees. A sale is currently being prepared that will place logging equipment in the area and logging trucks on the main access roads toward Salina. No significant impacts are anticipated from the proposal.

The only mining in the immediate area is the existing mine in Convulsion Canyon run by SUFCo. The abandoned Knight mine is located approximately 6 miles south of SUFCo's mine. It is currently being reopened. The activities associated with SUFCo's mine will have no direct impact on the Knight mine which is owned by Energy Reserves Group, Inc.

A number of cabins have been built in the Acord Lakes area about three miles west of the SUFCo mine. This area will be affected slightly by the increase in traffic to the mine. Access to this area has been made much safer and quicker as a result of the mining operation.

An administrative study covering about 40 acres is located on SL-062583 which is held by C.S. (See Appendix 6 for location and photo.) The study consists of contour trenching on a hillside and a fenced off area at the base of the hill to evaluate the effects

of contour trenching. Should subsidence occur, the study could be extended to include the effects of subsidence.

Only two special uses now occupy the lease area. They are both permits issued to Utah Power & Light Company. One is a powerline, the other is a road to service the powerline. These support the SUFCo mine. The special uses are located on the southern edge of the lease and on topography below the coal seam. This proposal will utilize power from the line for mining. Surface subsidence could result in damage to these facilities, but the restricted mining under canyon rims should control subsidence which if it would occur could cause localized rock slides. These rock slides are the major problem as far as the powerlines are concerned.

Some oil and gas exploration has recently occurred in the immediate area. Future exploration can be expected. The mining operation will have no detrimental impact on these operations. There are no oil or gas wells in the area.

(b) Surrounding Land Use

The surrounding land use is much the same as the land use in the immediate area of the mine. The only substantial difference is the farming activity east of the mine toward Emery. These farms depend on water for irrigation and livestock watering from Quitchupah Creek. A decrease in the water flow or degradation of the quality could have a substantial impact on these operations. It does appear though that the mining operation may actually increase the water flow rather than decrease it, and since the water discharge

at the mine is controlled by a discharge permit, the quality of the water should not be lowered.

The nearest communities to the mine are Emery and Salina, see Figure 2 for location of the mine with respect to the surrounding communities. Emery is approximately 9 miles east of the mine, but it is 40 miles away by improved roads. Salina is approximately 30 miles away by paved roads. The increased mining activities by SUFCo on these leases will not substantially increase any existing impacts on these communities. The combined mining in the future will have an increased impact on the communities. Aside from the socio-economic impact which is handled under its own heading in this report, the transportation impact will be of major concern. The increase in coal haulage will increase the related hazards of vehicular accidents. There will be an increase in incidence involving cattle and wildlife. Plans are currently underway to pave the access road from I-70 to the mine. This should lower the driving hazards. Better control of cattle will be required to decrease this hazard. As far as wildlife is concerned, there are relatively few mitigating measures that can be taken aside from the complete cessation of coal haulage by truck which is economically unfeasible at this time.

(c) Architectural, Cultural, Historical, and Archeological Sites

There have been no significant architectural or cultural sites identified in the immediate area.

There are archeological sites, mostly in the form of chippings from arrow heads, throughout the area. The destruction of these can be controlled by surveys before any earth work is performed.

The mine at its present location has been operating since 1941, so if any archeological sites did exist here, they were destroyed long ago, see Appendix 4 for archeological surveys.

The only known historical site is Jack Hadley's Monument. It is located above the mine on the plateau between Mud Spring Hollow and East Spring Canyon, see Appendix 6 for location and photo. Many years back, Jack and his horse were struck by lightning and killed. They buried the horse there and built a small stone monument. The monument is located over the worked area of the existing mine. Pillars were not "pulled" in this area, so the probability of subsidence here is small. If subsidence should occur, it would in all probability be gradual resulting in only minor disturbance.

(d) Scenic and Aesthetic Sites

As far as terrain is concerned, the view from plateau is basically the same as anywhere else on the Wasatch Plateau. The canyon formed by Quitchupah Creek is quite interesting and scenic though. It starts out as a creek and within 2 miles it has been dug out into a 1,000 foot deep canyon with very sheer cliffs, see Appendix 6 for photos. The mine should have little impact on this canyon since the mining will be restricted to first mining under the canyon rims. This should eliminate, for the most part, the effects of subsidence.

Another interesting view is that of the mine from the top of the Plateau near Hadley's Monument, see Appendix 6 for photos. The SUFCo mine site is approximately 700 feet below the plateau rim. In this writer's opinion, the mine adds to the scenic value rather than detracting from it.

The Mesa rim and deep canyons can be seen as background from Emery (Dog Valley). They are classified as distinctive with variety. Activity from the proposal will not be visually evident from the valley. The area is seen as middle ground from a few remote spots on the Duncan Mountain Road. This scenic area is presently classified in Sensitivity Level 2 (Average Sensitivity). The visual objective as recommended by the F.S. Land Use Plan is 2 (Modification). This permits activities to visually dominate the characteristic landscape. Very few people visit the area and those that do, come for something other than scenic attractions.

Coal exploration and the associated construction of access roads, drill pads and ventilation fan sites will result in alteration of the natural scenic values of the area. Earthmoving will create unnatural land forms and bare earth will contrast with the background color. Scars to the natural landscape from road and drill pad construction will be highly visible if located on the steep slopes. Such changes to the landscape will be evident for long periods of time and extensive changes of the landscape in the area of the leases may dominate the natural undisturbed scenic values. Any earth moving activities will change the present scenic values of the area. Dust resulting from these activities may be highly visible under certain conditions and add to the impacts.

The accumulation of trash and garbage along access roads and area of continuing operation and human activity can be expected to occur and will represent an intrusion to the relatively natural state.

(e) Mined Land Reclamation Potential

The reclamation of drill sites occupied in 1974 and 1976 is basically the only source of information available for this section. There were no difficulties encountered with this reclamation.

The environment, as far as elevation and vegetation is concerned, for the drill sites is quite a bit different than that of the mine site. We believe that the two can be correlated though as far as the reclamation potential is concerned since they both have basically the same climatic conditions. The soil in the canyon where the mine is located is poorer and thinner than that of the drill sites which are located on the plateau. This is the deciding factor for the reclamation. With proper seeding, fertilization, and irrigation, it should be possible to restore the mine site back to its pre-mining condition. There will be some bench cuts though that will remain after reclamation.

The mine site was originally used only by wildlife. There are no plans to use the site for any other purpose after reclamation. Taking this into account, there should be little difficulty in restoring the land to its intended use.

(f) Potential for Subsidence and Monitoring

The potential for subsidence is high, as is the case in most mining operations. Mining under steep canyon rims will be restricted to room and pillar mining, with a recovery of 30 to 40 percent of the coal. This should decrease the likelihood of subsidence under these rims. Figure 11 shows the areas likely to be affected by subsidence. It also shows the location of the monitoring grid.

(6) Flora and Fauna

(a) Plant Species

Vegetation changes from one landform to another. On the sage-grass and Ponderosa pine benches landform there are patches of open grown Ponderosa pine alternating with a sagebrush-grass community. Minor amounts of deformed aspen occur in scattered patches. Ground cover is composed of several native grasses, forbs, and low brush species. Density is generally good.

The steep slopes and scarp faces landform is sparsely vegetated. Pinyon, juniper, and mountain mohogany are scattered over the landform. Site is very harsh and ground vegetation is limited to light quantities of native grasses and forbs in cracks and shelves where soil can accumulate.

Narrow stringers in canyon bottoms landform is the most productive in the area. Vegetation is primarily native grass, low brush, and forbs growing together to form a heavy sod. Only an occasional tree occurs in the bottoms. The rolling hills landform is covered by only an occasional small patch of trees which includes Ponderosa pine, Douglas-fir, Alpine-fur, and Aspen. More common are brush species including oak, snowberry, and sagebrush. Grasses and forbs are very sparce and include several native species.

Construction of temporary and permanent roads, drill pads and mudpits, ventilation fans, and attendant facilities will all require the removal or disturbance of the existing vegetation. Native vegetation will be totally or partially removed due to anticipated developments. Additional impacts to vegetation can be expected to

occur from increased off-road vehicle use, that will be associated with the exploration, construction, and operation of the mine. However, considering the limited amount of surface developments anticipated on the lease areas, the loss of existing vegetation is expected to be slight and no major impacts are anticipated.

(b) Animal Species

The lease has a similar component of animals common to the Old Woman Plateau. Those for which impacts may occur are only a few.

Bald and Golden Eagles have been observed. It is believed they winter in the steep slopes and scarp faces on the eastern edge of the area. Mule deer use the area for summer range. Elk winter in the lease area. Black bear, coyote, and mountain lion are present.

The greatest impacts to deer and elk will be from the disturbances and possible harassment caused by the increase in human activity at the work sites and in the general areas on or near the lease areas.

During working hours, these activities will be associated with mine work: new construction; car, truck, and train traffic; drilling and other general disturbances. During non-working hours or non-working days, these activities will be of a recreational nature: off road vehicle use, sightseeing, and poaching.

Winter drilling will cause displacement of elk and thus reduce the available elk range by approximately 1/2 mile radius or about 600 acres around each drill rig. Planned activities will not otherwise impact wildlife.

(c) Endangered and Threatened Species

No threatened or endangered species are known to occupy the area according to the Environmental Analysis Report prepared by Fredrick L. Peck, U.S. Forest Service, see Appendix 3.b. Also see Appendix 3.c. for the FS clearance.

(d) Potential for Establishing Vegetative Cover

See Section (5) part (e) Mined Land Reclamation Potential.

(7) Socio-Economic Conditions

(a) Employment Anticipated

Table 3 gives the anticipated manpower requirements which would peak in 1979. This table does not include the personnel required to truck the coal. An additional 100 people over the present mine employment will be necessary to reach the 1979 employment level. This will mean an increase of about 50 people per year for the next two years.

TABLE 3
Manpower Requirements

<u>STAFF</u>	<u>1979</u>
General Manager Operations -----	1
Chief Mine Superintendent-----	1
Chief Engineer-----	1
Comptroller -----	1
Staff Engineers-----	10
Staff Accounting -----	10
Training Officer-----	1
Safety Director-----	1
Maintenance Superintendent -----	1
Mine Superintendent-----	1
Genral Mine Foreman-----	1
Shift Mine Foreman-----	3
Yard Foreman-----	1
Maintenance Foreman -----	3
Face (unit) Foreman -----	14
TOTAL STAFF -----	<u>50</u>

TABLE 3 (Cont.)

<u>SURFACE</u>	<u>1979</u>
Mechanics and Welders.....	14
Electricians	6
Tiplemen and Loader Operators	10
Yard and Road Maintenance	4
Belt Patrolmen	2
Warehouse, Janitors, and Lampmen	6
	<u>42</u>
 <u>UNDERGROUND FACE (Conventional)</u>	
Cutting Machine Operators	-
Face Drill Operators	-
Blasters	-
Load-Haul-Dump Operators	-
Ventilation Men	-
Rib Cleanup Men	-
Mechanics	-
Roof Bolt Operators	-
	<u>-</u>
 <u>UNDERGROUND FACE (Continuous)</u>	
Continuous Miner Operators	12
Continuous Miner Operator Helpers	10
Shuttle Car Operators.....	32
Roof Bolt Operators	22
Ventilation Men	10
Utility.....	10
Mechanics	12
	<u>108</u>
 <u>SERVICE UNDERGROUND</u>	
Mechanics	12
Electricians	6
General Labor	12
	<u>30</u>
 <u>OTHER UNDERGROUND</u>	
Supply Men.....	6
Belt Patrolmen	4
Rock Dusters.....	5
Ventilation Men.....	4
Fire Bosses	4
Pump Attendants.....	3
	<u>26</u>
 TOTAL HOURLY EMPLOYEES	 206
 GRAND TOTAL	 256

(b) Availability of Workers

Skilled laborers are in a high demand by the coal companies as a result of the recent increases in mining in Central Utah. Consequently there are few unemployed skilled miners. The coal companies are using unskilled laborers from local communities and training them on the job.

Coal miners seem to be an erratic group, and in general, the absenteeism is high. This adds to the shortage on miners.

(c) Effects on Local Population Centers

SUFCo now employs about 140 persons, most of whom live in Salina and nearby towns. About three times that number are involved in support activities such as transportation, services, merchants, and community services.

The working age population of Sevier County is over 2,150 and Salina area accounts for about 500 of them. Salina is the nearest town to the lease by way of roads. Coal from the Southern Utah Fuel Company's operation is being trucked to Salina. Higher wages are being paid for mining than agriculture.

Extending the life of the operating mine will add stability to the existing social and economic situation in Salina and surrounding towns. Increased production would increase the number of people employed in mining associated jobs by about 100. Additional jobs could be filled by local graduating high school seniors and residents in lower paying jobs. A few workers will also move into the area, especially for jobs requiring special skills. With the

apparent stability of the mine, there may be interest stimulated to establish a year-round community near Acord Lakes recreation subdivision. This latter possibility would be a "boom town" situation.

An increase of 100 miners will mean added income to the County. If half of the miners come from the agriculture community and the rest from outside the area, payrolls in the area could increase up to 1.2 - 1.4 million dollars. This will increase the taxes collected and the support services where the dollars will be turned over.

(d) Effect on Cultural Resources

In general, mining influences are in a minority position in the social and economic environments of Sevier County. It does, however, substantially affect Salina. The majority of the immediate area influence is agricultural based and a rural atmosphere dominates the habitable areas. The LDS (Mormon Church) now prescribes social norms to 90 percent of the population in Sevier County. These norms are much more conservative than the usual mining town generates. While many do not conform to the Mormon Church principles, the principles do have a commanding influence.

(e) Availability of Community Services

Salina and Richfield are the communities which will be impacted the most by the mining operation.

Community services in general are presently adequate. Salina and Richfield supply the essential requirements of the surrounding area. People come to Richfield from as far away as Escalante to obtain some of the services supplied there.

Both Salina and Richfield have adequate schools for the present population. Richfield also has the Sevier Valley Technical Institute. The increase in population associated with this project will be small. It is anticipated that an additional 100 miners will be required. Most of these will come from the surrounding communities. As a result of this, the school systems as well as the other social services should feel the impact only slightly.

Salina and Richfield presently have adequate police and fire protection. Richfield has a hospital and a clinic, and Salina has a doctor. Health services in this area are considered good. Salina has 2 new motels in addition to the existing ones. Richfield has a large number of motels.

(f) Public Opinion

At the time of this writing, this office has received no written comments concerning the operation. From the writers experience in the area, it appears that the general concenses is in favor of the mining. This is especially true since the mining brings travelers to the area all year long. This helps offset the lack of tourists in the winter.

C. Alternatives to the Proposed Action

The three basic alternatives are:

- a. No Action.
- b. Alternative mine sites.
- c. Strip-mining or other surface mining methods.

The no action alternative, which would deny SUFCo the right to mine Federal coal, would in effect cause the mine to close. This would

result in the unemployment of the present work force and a large loss of income to the surrounding area. The continued operation of the mine will not add greatly to any existing environmental impact.

The alternative mine site and the alternate mining methods are in reality not alternatives at all. The selection of another mine site would greatly increase the environmental damage, especially since the present site is essentially complete and requires little additional work. The alternate mining methods, i.e. strip mining or open pit mining, would be uneconomical and would result in extensive unnecessary environmental impacts.

D. Adverse Environmental Impacts Which Cannot Be Avoided

Since the mining of the Federal coal is being done by underground mining methods, the only major surface disturbance is at the mine site which is only 10 acres.

Noise, gases, and dust are generated at the mine site and the haul road, although these can be controlled to some extent. The haul road may also interfere with elk migration routes.

Surface excavation to level work sites will leave scars on the landscape as will road construction on side slopes.

Surface runoff water will carry soil and coal dust from exposed excavations, spoilage dumps, and roads, an effect which can be minimized by proper design.

Subsurface and surface water patterns may be altered due to subsidence and the interception of aquifers by the mine works and fractures caused by subsidence. Coastal States will provide alternate water supplies if surface springs are dried up as a result of mining.

Fire hazards will increase with the increase of men and machines. The fire hazard in most of the area is not very high due to sparse vegetation.

The coal will be used as fuel, and hence, would be consumed and irretrievably lost.

E. SUMMARY OF ENVIRONMENTAL IMPACT EVALUATION

License Number _____
 Licensee (Permittee) Coastal States Energy Co.
 County Sevier
 State Utah
 Date April 18, 1977
 Prepared by Ralph J. Blumer
 Other Agency _____
 Representatives _____

PROPOSED ACTION

	Construction	Pollution	Exploration or Mining	Transport Operations	Accidents	Other
Roads, bridges, airports, railroads						
Transmission lines, pipelines						
Dams and impoundments						
Structures (mine buildings, etc.)						
Others						
Burning, noise, dust						
Liquid effluent discharge						
Solid waste control and disposal						
Others (toxic gases, noxious gases, etc.)						
Exploration (drilling, trenching)						
Surface Excavation (tunnel, stripmining, etc.)						
Storage (product, waste, spoil)						
Mineral processing (ext. facilities)						
Others						
Trucks, railroads						
Pipelines, conveyors						
Others						
Spills and leaks, explosions						
Landslides						
Operational failure						

Existing Conditions:

Land Use	Construction	Pollution	Exploration or Mining	Transport Operations	Accidents	Other
Forestry	/		/			
Grazing	/	/	/	/	/	/
Wilderness						
Agriculture		/	/		/	
Residential - Industrial		/	/	/	/	
Mineral Extraction					X	X
Oil and Gas						
Recreation	/	/	/	/	/	/
Scenic Views	/	/	/	/	/	/
Parks, Reserves						
Monuments						
Historical Sites						
Unique Physical Features						/
Birds	/	/	/	/	/	/
Land Animals	/	/	/	/	/	/
Fish						
Endangered Species		/	/			/
Trees, Grass, Etc.	/	/	/	/	/	/
Surface Water	/	/	/	/	/	/
Underground Water			/		/	/
Air Quality	/	/	/	/	/	/
Emission	/	/	/	/	/	/
Coal						
Effect on Local Economy						
Safety and Health	/	/	/	/	X	X
Others						

F. Recommendation and Determination

I determine that the proposed action does not constitute a major Federal action significantly affecting the quality of the human environment in the sense of NEPA, Section 102 (2)(C), and is not highly controversial.

Prepared By Ralph J. Blumer 9/30/77
Ralph J. Blumer, Mining Engineer Date

Approved By Jackson W. Moffitt 9/30/77
Jackson W. Moffitt, Area Mining Supervisor Date

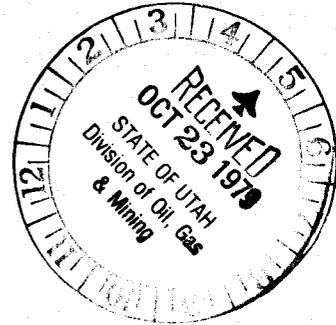
Reviewed By Tom Turner 9/30/77
Tom Turner, Mining Engineer Date

ENVIRONMENTAL ASSESSMENT RECORD/TECHNICAL EXAMINATION

TITLE 43 CFR PART 3041

FEDERAL COAL LEASE SALE U-28297

COASTAL STATES ENERGY COMPANY, APPLICANT



Approval of Report
Recommended by:

Donald E. Hunte (ln)
Forest Service, District Forest Ranger
Richfield Ranger District
Fishlake National Forest

Aug 1, 1978
Date

William E. Boley (ln)
Forest Service, District Forest Ranger
Ferron Ranger District
Manti-LaSal National Forest

8/2/78
Date

Harwin A. Anderson
BLM Area Manager
Sevier River/Resources Area
Richfield District

8/1/78
Date

Report Approved by:

Paul C. Casca
Forest Supervisor
Fishlake National Forest

8/1/78
Date

Paul C. Chestnut
Forest Supervisor
Manti-LaSal National Forest

8/2/78
Date

Donald E. Pennington
BLM District Manager
Richfield District

8/1/78
Date

NEGATIVE DECLARATION

ENVIRONMENTAL ASSESSMENT RECORD/TECHNICAL EXAMINATION

Richfield Ranger District

Fishlake National Forest

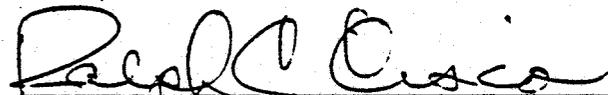
Ferron Ranger District

Manti-LaSal National Forest

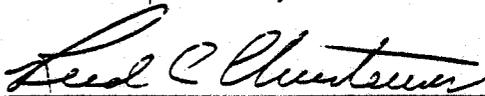
Sevier River Resource Area

Bureau of Land Management

This proposed activity is not considered to be a major Federal Action significantly affecting the quality of the human environment requiring an environmental statement pursuant to Section 102(2)(C) of the National Environmental Policy Act of 1969 (PL-91-190) or to be highly controversial. Those actions that could adversely affect the quality of the physical and biological components in the project area would be sufficiently minimized to prevent significant adverse environmental impacts. Overall social and economical effects of the proposal are considered to be beneficial. Consultation with others on the proposed project did not reveal significant adverse reaction. These determinations are based upon evaluations made in the attached Environmental Assessment Record/Technical Examination.



RALPH CISCO
Forest Supervisor, Fishlake National Forest



REED C. CHRISTENSEN
Forest Supervisor, Manti-LaSal National Forest



DON PENDLETON
District Manager, Richfield District, Bureau of Land Management

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CHAPTER I

INTRODUCTION

A. Purpose and Scope of Analysis

October 1, 1974, Coastal States Energy Company of Houston, Texas made application to the Bureau of Land Management (BLM) for a short-term criteria coal lease for 2,631.98 acres of open federal coal lands. The lands applied for are adjacent to Coastal State's active underground coal mine in Convulsion Canyon, Sevier County, Utah. All mining activity would be underground.

Coastal States' lease application was evaluated by the BLM in December of 1974 and was found to meet the short-term criteria then in effect. The BLM recommended that the acreage requested be put up for lease pending preparation of an environmental analysis report/technical examination. The BLM prepared the part 23 technical exam in April 1975, and the Fishlake National Forest prepared an environmental analysis report in March 1976. A public meeting was held December 21, 1976 in Price, Utah, and comments were received concerning the lease. No action was taken to issue the lease prior to the NRDC vs Hughes (Civil Action 75-1749) coal leasing suit which was filed September 27, 1977 and the mine plan was approved. An agreement reached June 14, 1978 by the groups involved in this suit allowed the processing of Coastal States' lease application.

This environmental assessment record/technical examination was prepared in response to Coastal States' application for a competitive lease sale of open federal land. This document was prepared as required by the National Environmental Policy Act of 1969, through a cooperative effort of the U.S. Forest Service and Bureau of Land Management, the principal surface management agencies administering the proposed lease area. Data for the technical examination were gathered by an interagency environmental assessment team. The combined environmental assessment and technical examination were coauthored by personnel of the Fishlake and Manti-LaSal National Forests, BLM Richfield District and BLM Utah State Office.

The purpose of the assessment is to:

1. Evaluate impacts of development of the proposed lease by Coastal States Energy Company.
2. Determine if the leasing action (and implied development) meet the land management plans of the surface management agencies.
3. Analyze alternate ownership and the no action alternative.
4. Develop site-specific surface protection stipulations which would be incorporated into the lease.
5. Determine the necessity of preparing an environmental statement.

B. Land Description

The proposed lease area is in Sevier County, Utah, approximately 30 miles east of Salina, Utah. The area lies on federal lands in Convulsion Canyon on the southernmost edge of the Wasatch Plateau coal field (Figure 1). The surface is managed by the Forest Service, Fishlake National Forest (2204.67 acres), Manti-LaSal National Forest (262.97 acres), and the Sevier River Resource Area, Richfield District, of the BLM (164.37 acres).

Access to the area is gained by traveling east on I-70 from Salina, Utah, approximately 20 miles, then 10 miles north on a paved road to the perimeter (Figure 2). Access to the interior of the tract is by an unimproved dirt road.

The proposed lease area is legally described as:

<u>Tract</u>	<u>Location</u>
U-28297	<u>T.21S., R.5E., SLM, Sevier County, Utah</u> Section 32; S $\frac{1}{2}$, Section 33; W $\frac{1}{2}$ SW $\frac{1}{4}$
	<u>T.22S., T.5E., SLM, Sevier County, Utah</u> Section 4; W $\frac{1}{2}$ W $\frac{1}{2}$, Section 5; A11 Section 7; S $\frac{1}{2}$, S $\frac{1}{2}$ NE $\frac{1}{4}$, Section 8; A11, Section 17; NE $\frac{1}{4}$, N $\frac{1}{2}$ NW $\frac{1}{4}$ Section 18; N $\frac{1}{2}$
	Total 2,631.98 Acres

UTAH

Legend

-  National Parks and Monuments
-  Military
-  Indian Lands
-  National Forest
-  National Recreation Area

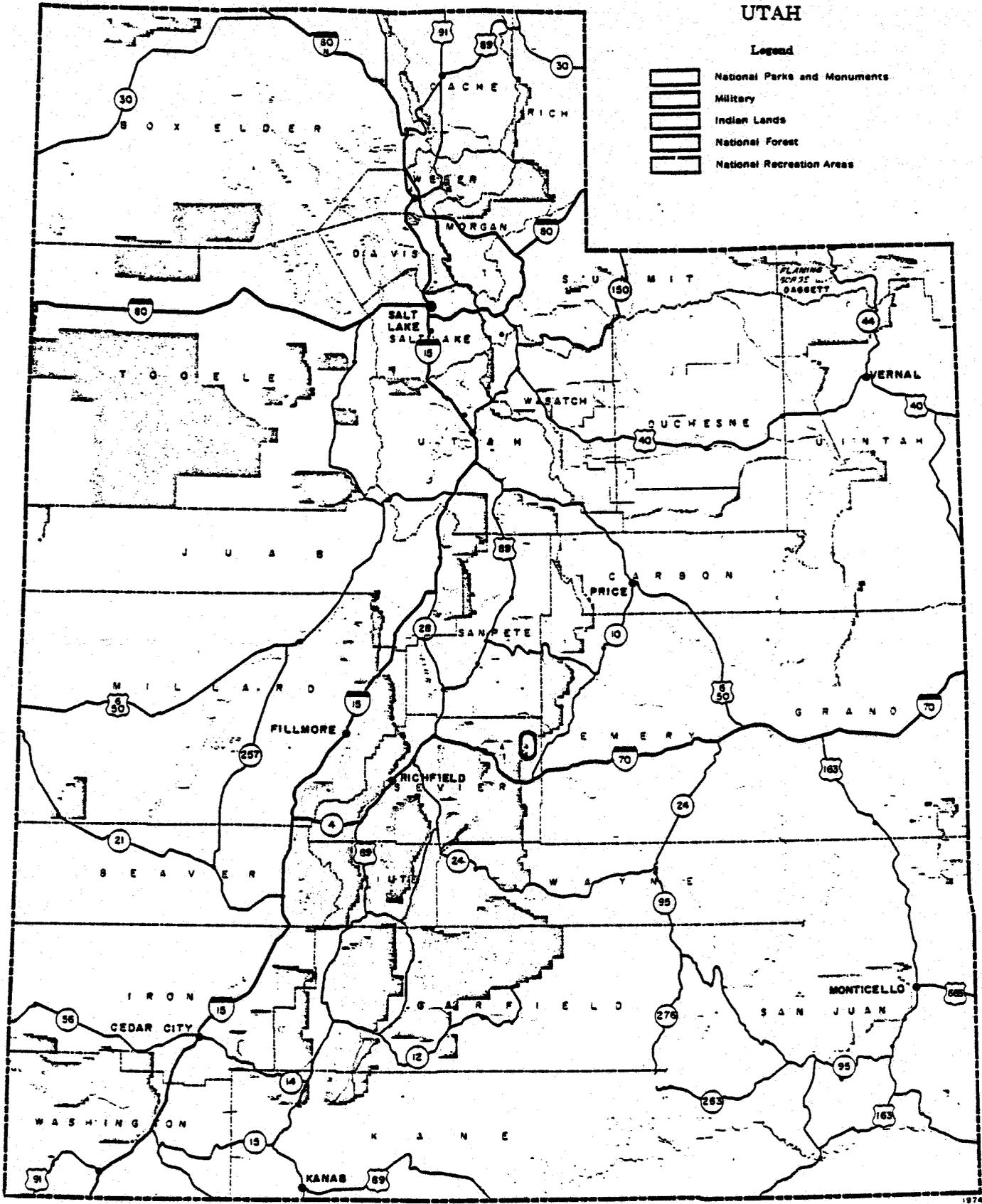


FIGURE 1 GENERAL LOCATION MAP
 Proposed Lease Area

July, 1978

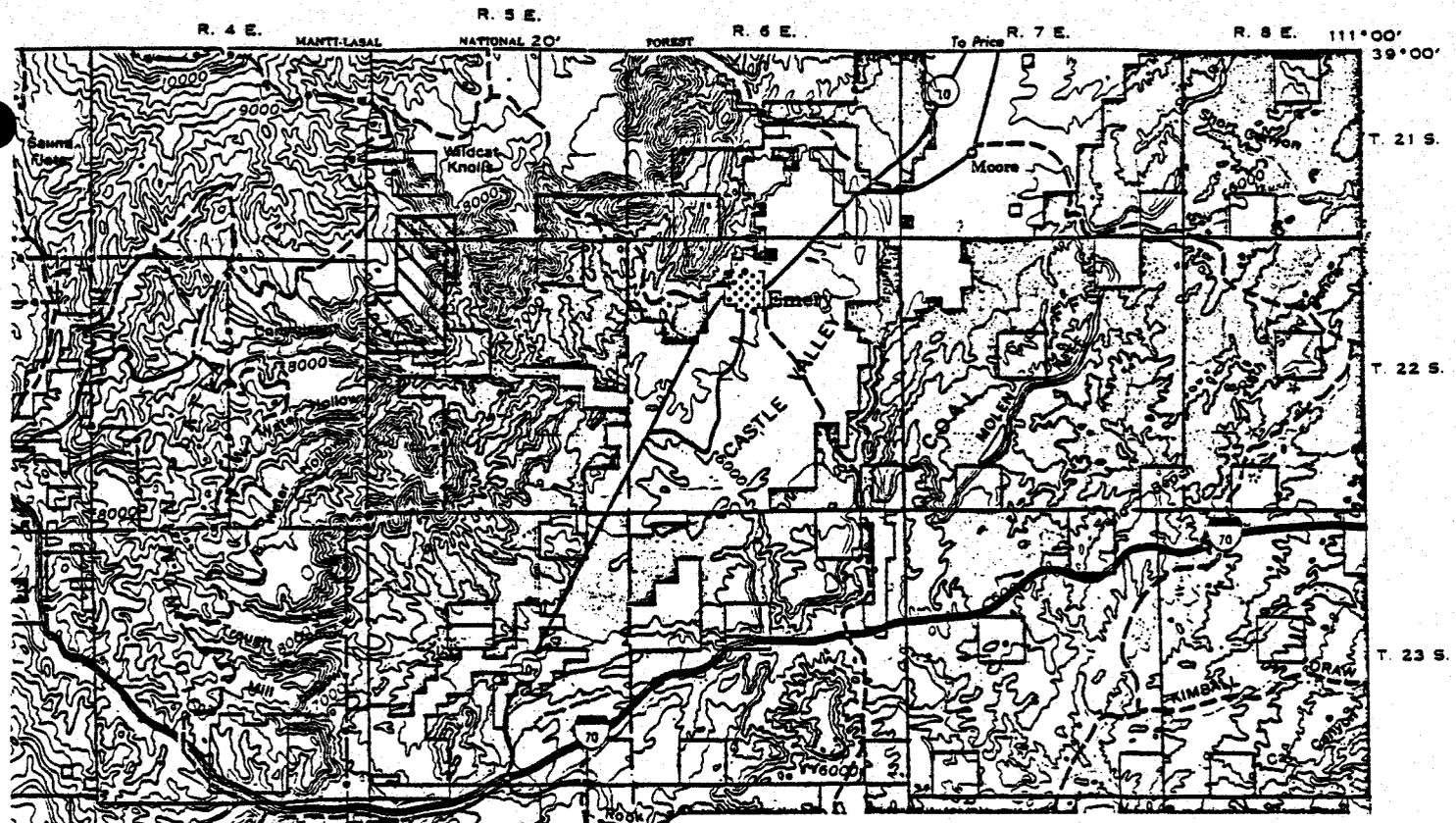
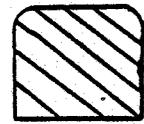
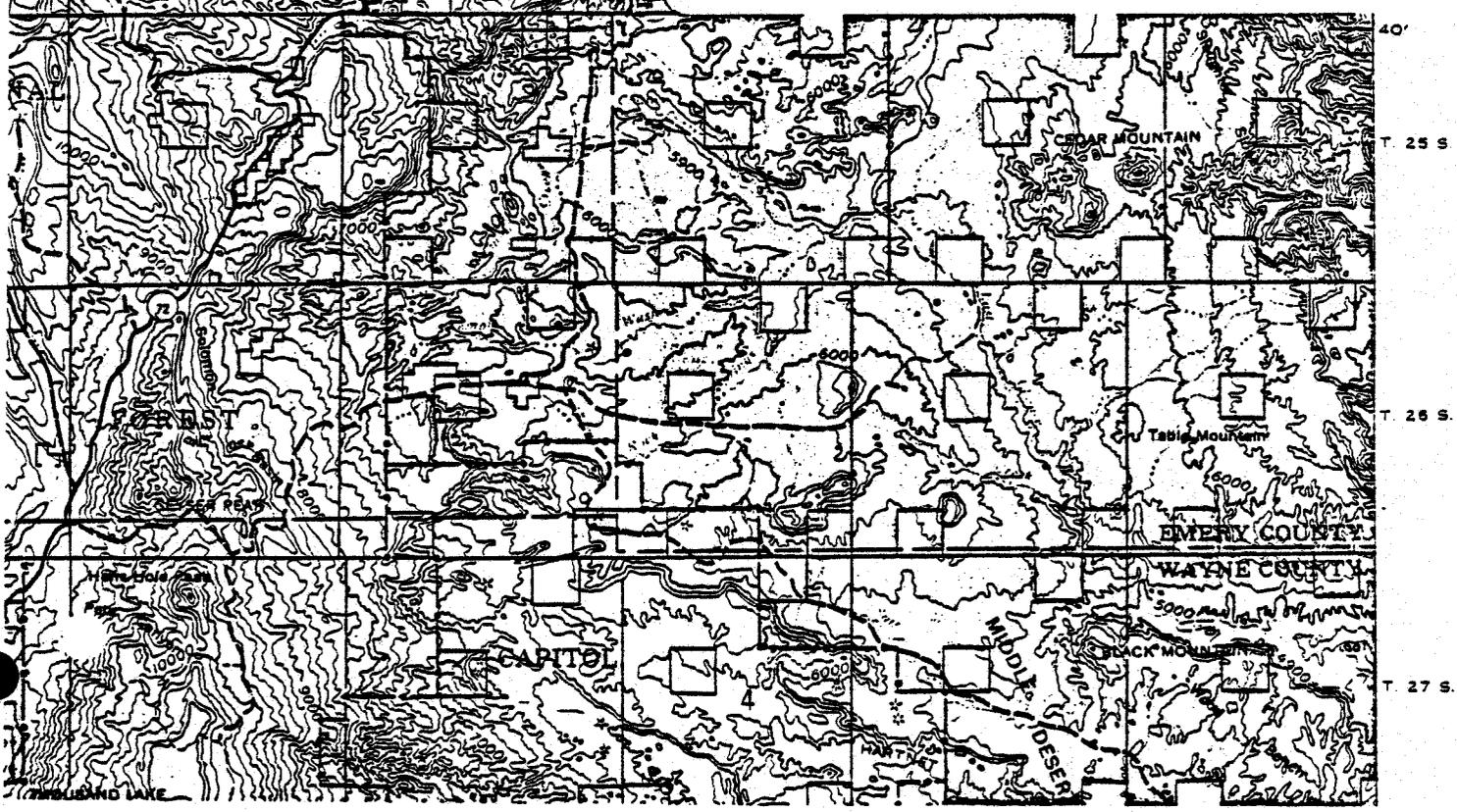


FIGURE 2
Regional Map of Proposed Lease Area



Proposed Lease Area

July, 1978



CHAPTER II

EXISTING OPERATION AND PROPOSED ACTION

A. Probable Tract Development Scenario: Coastal States Energy Company

1. Coastal States Existing Operation

Coastal States presently controls 2,282.77 acres of adjoining Federal coal land contained in leases SL-062583, U-062453, and U-0149084, and 640 acres of fee coal land for a total of 2,922.77 acres in Township 21 and 22 South and Ranges 4 and 5 East, SLM, Sevier County, Utah (Figure 3).

Present reserve holdings in the existing lease and fee coal are approximately 60 million tons of which 50 to 80 percent is recoverable. This estimate is based on one minable seam in the presently held tracts.

Coastal States has divided its currently producing mine into two production zones. The first zone is mined and supportive pillars are left to protect main haulage ways and leave access to the lands being applied for and eventually to ensure surface stability. In the second zone, full extraction is employed; pillars are removed, and the surface is allowed to subside.

The mining method in the first zone protects the canyon from deterioration while mining under the canyon rim to the outcrop. The uneven boundary of the outcrop and the possibility of coal voids caused by ancient, naturally-burned zones, require a mining method flexible enough to mine the coal between the voids and the coal outcrop.

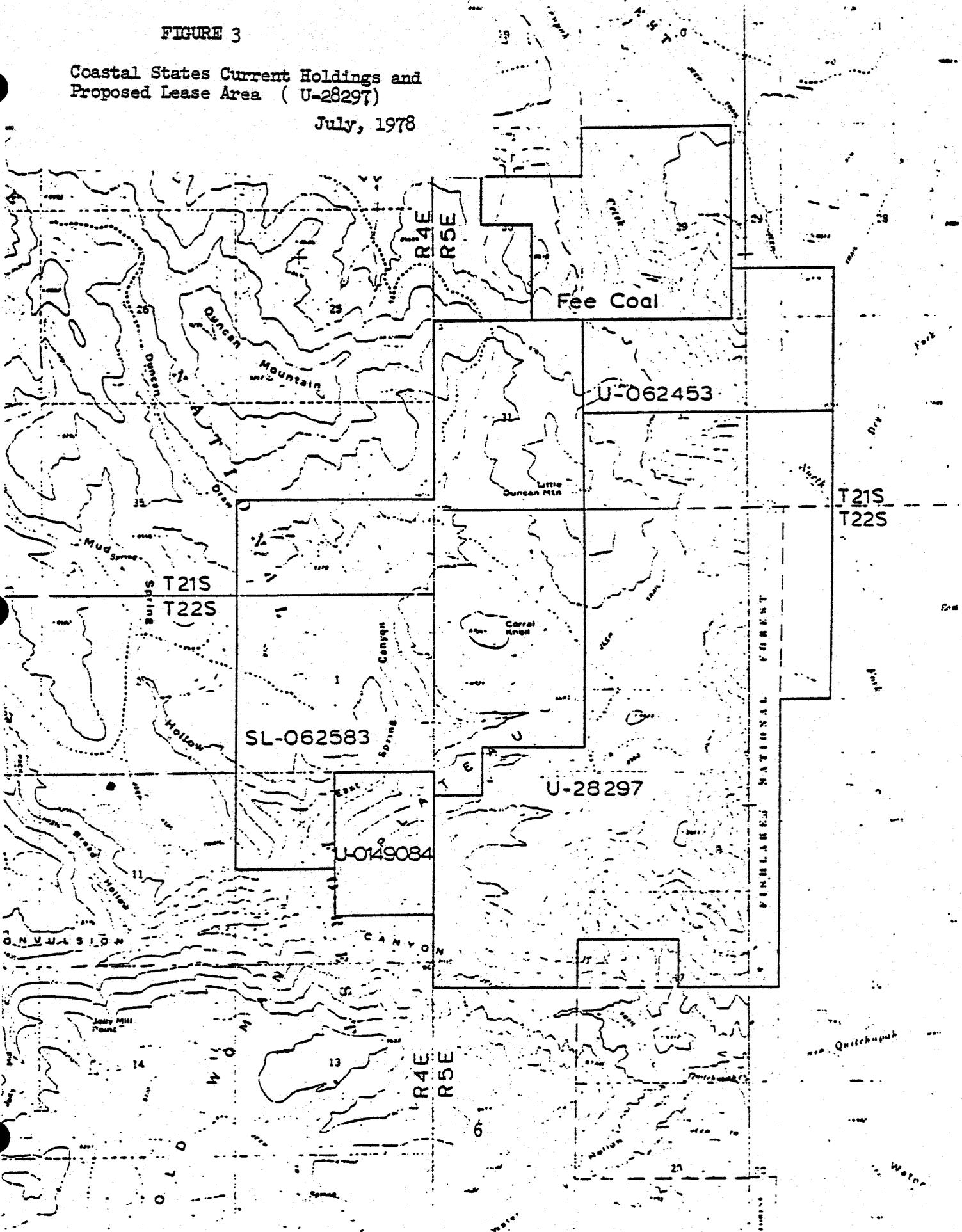
The second zone is under the plateau, away from the canyon rim, and is sectioned into blocks and zones that are conducive to high-recovery mining methods. Full extraction using continuous miners and teletrams is a variation of the room-and-pillar method that quickly achieves full or nearly full extraction. The method involves driving three or four development headings up to 2,500 feet with crosscuts to the boundary of the panel. Panels are connected by bleeder headings. The width of panel headings and crosscuts is 15 to 18 feet. Retreat mining begins by driving rooms 500 feet on the side of the panel development heading and then robbing pillars and chain pillars as mining retreats out of the panel. Coal recovery in these panels is 80 to 85 percent, based on mining height.

As rooms advance, two rows of pillars are blocked out. On retreat, the last row of pillars along the length of the 500-foot room is mined to the panel development heading. At this point, another room is driven

FIGURE 3

Coastal States Current Holdings and
Proposed Lease Area (U-28297)

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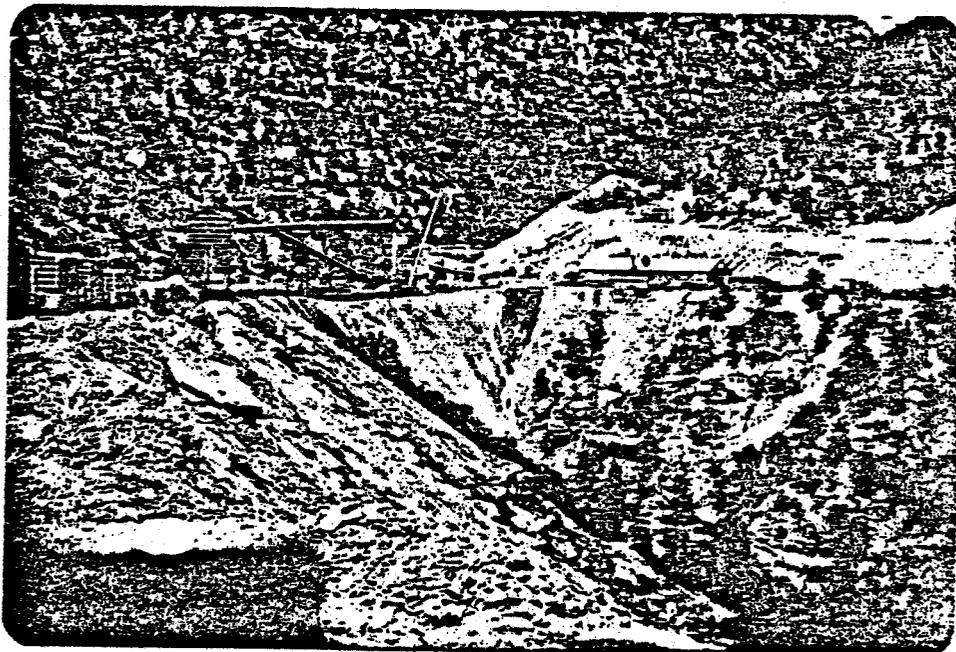
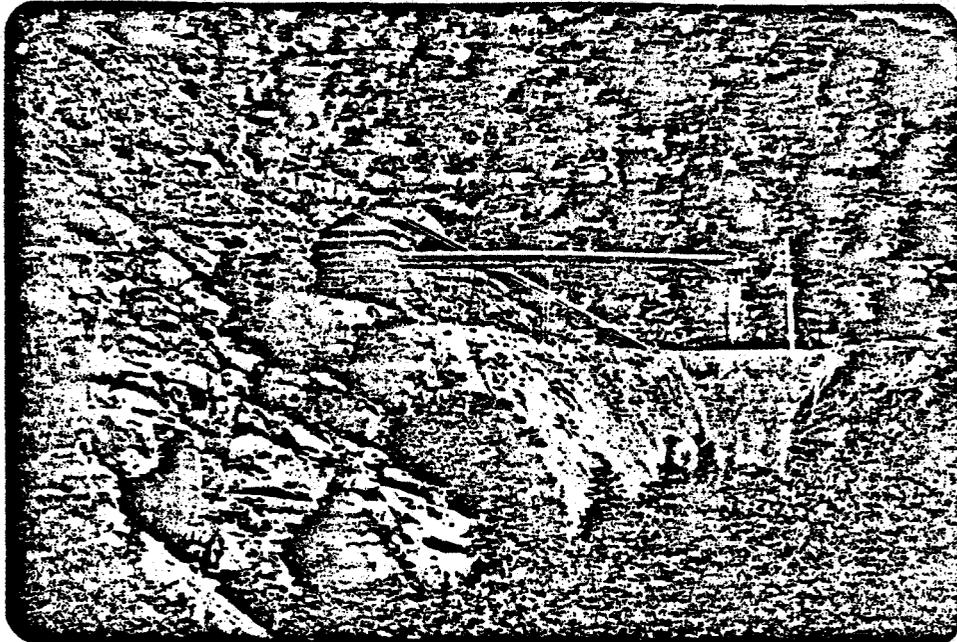


FIGURE 4 - Existing Surface Facilities

parallel to the original three, creating a new row of pillars, and again providing two rows of pillars. The mining sequence is then repeated by mining the row of pillars next to the row previously mined. This sequence is continued until the panel is completely mined out to the barrier protecting the main or submain entries.

Annual mine production has grown steadily since 1942, and rapidly since 1972. In 1970, annual coal production was 70,000 tons; 1971 - 143,000 tons; 1972 - 162,000 tons; and 1973 - 257,000 tons. Beginning in 1974, the mine was producing at an annual rate of 320,000 tons. The mine is currently producing at a rate of 1.5 million tons per year.

Coastal States has established a subsidence monitoring program. The work was begun in the field during September, 1977, and will be a continuing program. Emphasis of the program is on possible alterations of groundwater and surface water hydrology systems in the vicinity of the mine.

Surface facilities on approximately 10 acres include maintenance and supply shops, bathhouse, engineering offices, power substation and switch house, powder house, fuel tanks, coal handling and loading station, and a flood sediment tank. A coal stockpile and limited parking area are also located at the mine. Power for the mine is provided by transmission lines from Emery, Utah. Sanitary wastes are handled by a septic tank - drain field system (Figure 4).

The mine currently produces more water than it uses. Excess water is discharged under authority of a National Pollution Discharge Elimination System Permit No. UT0022918. Water is pumped from the active workings at the rate of about 144,000 gallons per day. This water is diverted underneath the mine site and flows into Convulsion Canyon.

Coal is currently hauled by 26-ton capacity trucks at an average rate of 9.6 per hour via Convulsion Canyon and I-70 to rail facilities in Salina and Levan, Utah. The coal is then transported by rail to customers in the Southwest.

Coastal States currently employs 205 persons. Employees who work at the mine are bused to the site from Salina by Coastal States.

Upon completion of mining, all lands disturbed by the surface facilities will be reclaimed as required by Coastal States mining plan. Drainage structures will be plugged or removed and riprap placed in channels to control erosion. Steel and wood structures in the area will be removed within 12 months time. Portals will be closed within the first 3 months as required by USGS. The mine site will be scarified, sloped, and revegetated as specified by the U.S. Forest Service. Concrete foundations will be buried with fill material, covered with topsoil, disked, and revegetated.

About 1,000 feet of road exists on the existing area. Coastal States does not plan to close the road as it could serve other uses, such as livestock management and fire fighting.

2. Coastal States Proposed Action

Coastal States propose to mine the lease tract from existing portals by extending mains and submains north and east. From these mains, port entries would be driven perpendicular to the outcrop barrier. Present surface facilities would adequately handle the expected increase in production; hence, no additional facilities are anticipated. However, the facilities are currently being upgraded to make existing operations more efficient. Coastal States proposed mine plan shows up to four air intake and emergency escape ways on the outcrop in Quitchupah Creek (Figure 5). These portals would be constructed from inside the mine; therefore, no outside access road would be necessary. The only surface expression would be an 8 foot by 20 foot opening covered with wire. Coastal States anticipates the need for up to 12 drill holes on the tract, necessitating construction of approximately 1 mile of new low-grade road, and minor upgrading of 2 miles of existing road.

Total expected production levels should the lease be issued and per the Mining and Reclamation Plan, would be as follows:

First year	1.50 million TPY
Mid-second year	1.75 million TPY
Third year	1.75 million TPY
Fourth year	2.1 million TPY
Fifth year	2.1 million TPY
Thereafter	2.1 million TPY

Coal would be trucked 30 miles to Salina, Utah, and 80 miles to a siding on the Union Pacific Railroad near Levan, Utah. All travel would be on existing roads. Frequency of truck traffic would be increased from an average of 9.6 trucks per hour at current levels to 11.1 trucks per hour, an increase of about 16 percent. These figures assume that a production level of 2.1 million tons per year would be reached and maintained and that the haulage fleet would be converted, within the limits of recently revised state statutes and regulations, from 26 ton trucks to 33 ton trucks. The trucks would run 20 hours a day, 6 days a week.

Coastal States would increase its work force to 256 persons should the lease be granted. Nearly 100 employees have been recently hired or will be hired in the near future. An additional 51 people would be hired over a 2-year period if the lease is obtained. Coastal States anticipates that all employees would come from Sevier and perhaps Sanpete Counties.

Preliminary studies on the proposed lease reveal a minable coal reserve of 21 million tons. However, further exploration is necessary to assess coal deposit depths, thickness, quality, and distribution within the proposed area. Known coal depths preclude pit or trench methods of exploration, so drilling would be required to complete exploration. On February 28, 1977 Coastal States filed an exploration plan with U.S. Geological Survey in compliance with Department of Interior Regulations

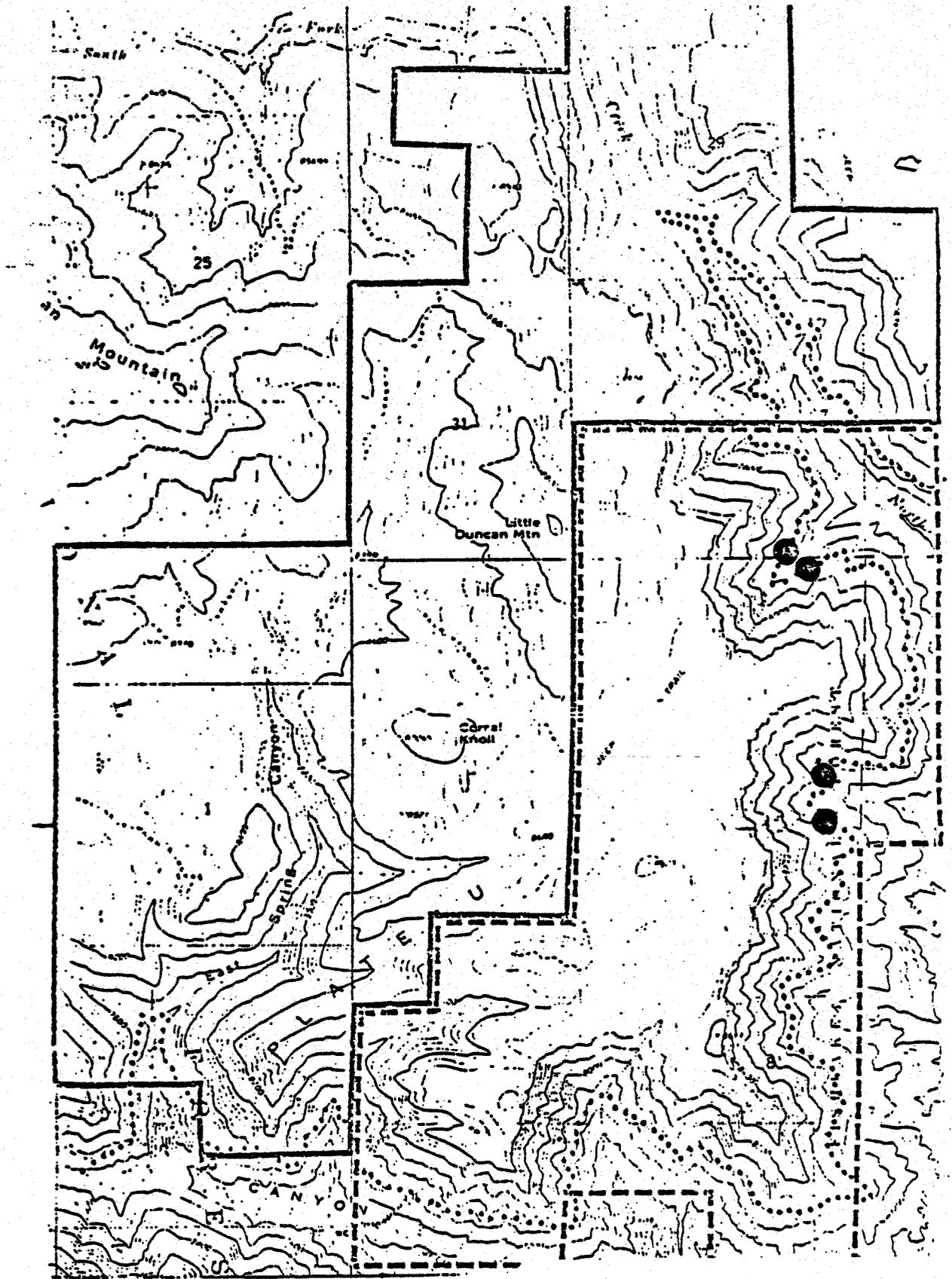


FIGURE 5

L E G E N D 10

—————	Acreage Controlled By SUFCO
- - - - -	Additional Acreage Requested
.....	Outcrop Zone

● Location of Air Intake and
Emergency Escape Ways

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Title 30, Chapter II, Part, 211 - Coal Mining Operation Regulations. In summary, up to 12 drill holes would be necessary to complete exploration requirements. There are seven primary drill sites and five contingency drill sites (to be drilled only if shown necessary due to primary drilling results). The exploration program is a separate and subsequent action to issuance of the lease.

Nine of the drill sites could be reached by existing roads and jeep trails. Approximately 1 mile of new road would be required to reach the other three sites. Jeep trails would require minor upgrading but no route changes are planned. The drill sites and access roads would be rehabilitated per requirements of the appropriate land management agency.

Coastal States anticipates that one drilling rig would be contracted from a reputable firm for all sites. Drill sites would be prepared by clearing all vegetation in an area 40 feet by 60 feet. This area would accommodate the drilling rig, drill service vehicle, water truck, logging truck and jeep. A mud pit, 8 feet wide, 10 feet long and 5 feet deep would be dug to contain cuttings and drilling fluid. Topsoil removed would be stockpiled for later use. Coastal States estimates that a maximum of 10 days would be required for each drill site. A maximum of 4 months would be spent "on-the-ground." This would occur during the first field season after lease issuance.

If the lease is issued, development would begin and continue throughout the life of the mine. Approximately 14 million tons of recoverable coal in the lease would be mined in conjunction with existing operations. No new portals, power lines, etc., would be necessary.

Mining coal on the proposed lease would extend the life of the mine approximately 1½ years at increased production rates and make the mine operational until 2000 if the lease were issued in 1979. More important to Coastal States, however, is that acquisition of the lease would provide more economical mining of its existing coal reserves.

A hydrological monitoring system is being implemented for surface water, groundwater, and water quality. This proposal is described in detail in a report compiled for Coastal States by WESTECH. The objective of the monitoring would be to characterize water quality in springs, streams, underground drainage in the Coastal States Mine, and water flows in these systems. The proposed monitoring would allow calculation of loads in the system and would indicate any impacts of subsidence (Figure 6).

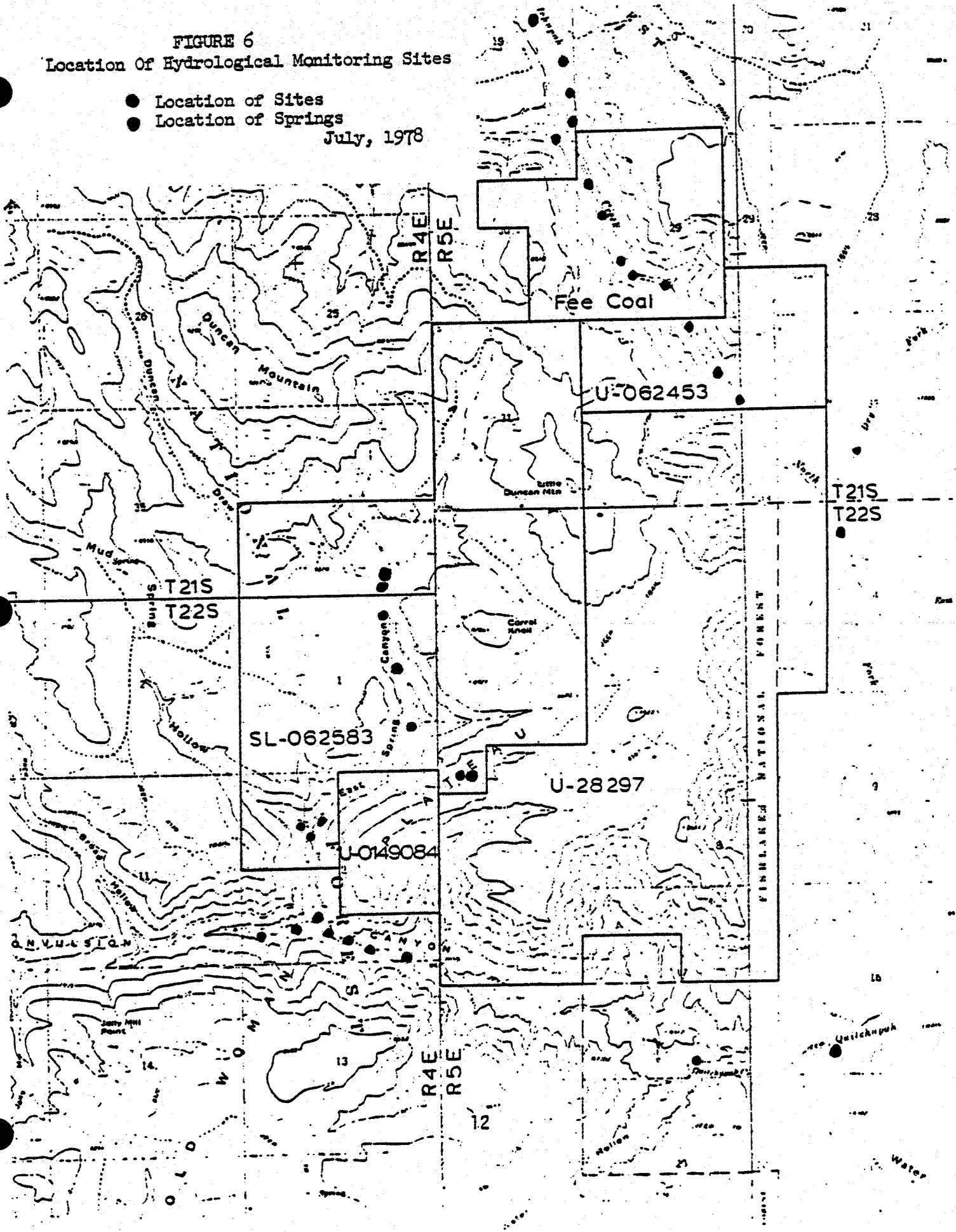
3. Federal Actions Required

The federal action being assessed is issuance of a competitive coal lease in accordance with 43 CFR Part 3520 and under the short-term provisions of the Secretary of Interior's announced coal leasing policy of February 17, 1973. This action is also in compliance with the NRDC versus Hughes settlement of June 14, 1978.

FIGURE 6
Location Of Hydrological Monitoring Sites

- Location of Sites
- Location of Springs

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The issuance of the coal lease implies the right to explore, develop, produce, and beneficiate the coal. Responsibility for environmental protection and restoration would also be integral components of the lease. If Coastal States obtains this lease, the proposed developments and production methods described in this chapter would be used. It is assumed, for analysis purposes, that full development would occur should the lease be issued.

If the short-term coal lease application is approved, mining and reclamation plans would be required under Sections 502 and 523 of the Surface Mining Control and Reclamation Act of 1977 (P.L. 95-87) and regulations promulgated pursuant to the Act. The mining and reclamation plans would be submitted by the lease holder for evaluation by the Office of Surface Mining and USGS to determine compliance with the requirements of federal regulations contained in 30 CFR 211 and 30 FR 700 et. seq. The mining and reclamation plans would contain site specific information on requirements of the initial regulations. The lease holder would be required to use mitigating measures contained in Chapter IV of this EAR in development of mining and reclamation plans.

The Bureau of Land Management is responsible for issuance of the lease and has lead responsibility for this action with participation and consultation from the U.S. Geological Survey and the U.S. Forest Service. By issuing the lease, the Federal Government would grant the lessee the exclusive right to mine and dispose of all coal under the terms and conditions of the lease.

Under the terms set forth in 43 CFR Part 3520, the BLM has the right to adjust royalties and other terms and conditions of a coal lease at the end of the initial 20-year lease period and every 10 years thereafter.

In addition to actual lease issuance, no other federal actions such as issuance of rights-of-ways, temporary use permits, etc., are anticipated.

B. Probable Tract Development Scenario: Alternate Ownership

Should someone other than Coastal States acquire lease U-28297, alternative mining methods must be considered. Coastal States personnel have indicated that the likelihood of Coastal States allowing some other operator to utilize its underground access corridors is remote. Therefore, alternative access to the coal could be from the coal outcrop on the North Fork of Quitchupah Creek, or vertical shafts at an unspecified location on the tract. Both alternatives would require exploration drilling prior to development, surface structures at an unspecified location, and a main access road (most likely from the Convulsion Canyon road).

Possible impacts of these alternatives are discussed in Chapter III. Lacking detail, the analysis of alternatives will be subjective in nature. However, for the purpose of this analysis, several development assumptions have been made:

1. The exploration program prior to development would be the same for each alternative, but would be more extensive than the program proposed by Coastal States.
2. Development on the outcrop would require road construction into Quitchupah Canyon and cutting the vertical canyon walls to accommodate surface facilities.
3. The most likely sites for the vertical shafts would be on top of the plateau and would require sinking a shaft through 800 - 1,000 feet of overburden to the coal seams. Total surface area disturbed would be 75 - 100 acres.
4. Rights-of-way would be required for installation of powerlines, telephone lines, haulage roads, etc. Temporary use permits would also be required for gravel, temporary roads, monitoring sites, etc.
5. Based on estimated available reserve figures, a new mine could produce at a rate of approximately 500,000 tons per year for about 25 years. Using mines of a similar type and size in the area as a reference, approximately 150 employees would be needed in the new operation.

C. Surface Management Agencies' Plans for the Affected Area

Those lands in the proposed lease that are administered by the BLM are within the Forest Planning Unit of the Sevier River Resource Area, Richfield District. A comprehensive inventory and Land Use Plan was prepared for the Forest Planning Unit by the Richfield District in 1977. The decisions resulting from this Land Use Plan recognized the need for producing coal from the planning unit and determined that the area covered by the proposed lease application was suitable for subsurface coal development (BLM, 1977).

That portion of the proposed lease area on the Fishlake National Forest is managed under the direction of the Richfield District, Salina Land Use Plan. The Salina Land Use Plan allocates the land area proposed for lease as a coal resource development area (USFS, 1976).

The following are management directions for the area as specified in the land use plan.

1. Work closely with mining industry in planning developments to insure and accomplish coordination with other resources and values, with special emphasis on the protection of watershed and critical elk winter range.
2. Take actions necessary to insure water quality standards are maintained.
3. Allocate increased grazing capacities to big game species commensurate with the need to maintain big game populations to about their present number.

4. Require extensive transportation planning in conjunction with coal development.
5. Survey and protect archaeological sites.
6. Initiate big game habitat improvement and watershed rehabilitation programs.

Any activity that would prohibit implementation of these management directions would not be allowed.

The portion of the proposed lease area on the Manti-LaSal National Forest is currently managed under the direction of the Ranger District Multiple Use Plan. The Multiple Use Plan for these areas is currently being updated by the Ferron-Price Land Use Plan, in order to reflect the direction of the National Environmental Policy Act of 1969. This plan is scheduled for completion in late 1978. In the interest of time and to comply with the intent of the regulations, a management unit was designated in the Ferron District Multiple Use Plan. This unit was designated "L-7 Coal Lands" and six management decisions were made to serve as direction until the Ferron-Price Plan was completed (USFS, 1977). These management decisions are:

1. Permit mineral leasing and mining activities.
2. Maintain existing water quality of Quitchupah Creek.
3. Locate mining facilities to minimize damage to scenic values and wildlife habitats.
4. Protect or mitigate cultural values in conflict with mining activities.
5. Study and monitor the effects of subsidence on land surfaces and hydrology.
6. Adjust mining plans to prevent subsidence of rims above Quitchupah Creek.

D. Adjoining Land Ownership and Uses

The proposed lease tract adjoins existing federal coal leases on the west and north and Forest Service, BLM, State, and fee lands on the east and south (Figure 7).

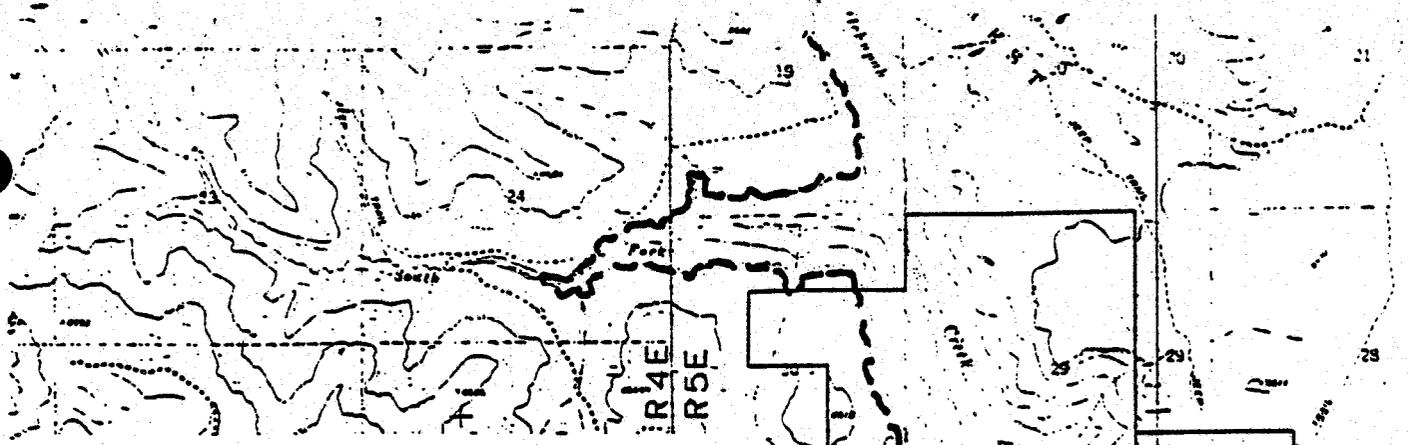
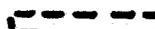
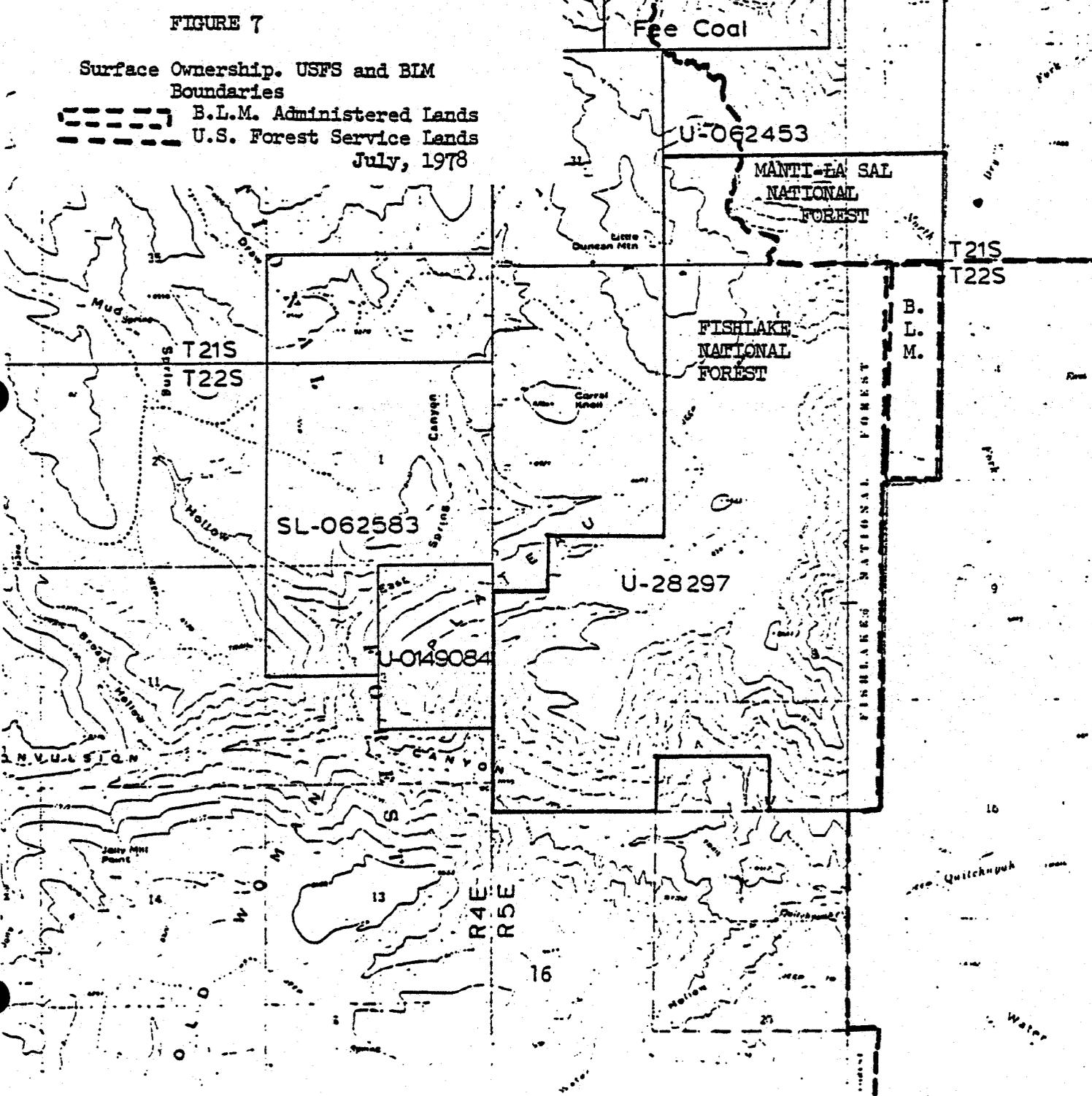


FIGURE 7

Surface Ownership, USFS and BLM
Boundaries

 B.L.M. Administered Lands
 U.S. Forest Service Lands
 July, 1978



Federal coal leases SL-062583, U-0149084, and U-062453 adjoin the proposed lease tract. Coastal States holds the total interest in leases SL-062583 and U-0149084. Coastal States holds a one-third interest in lease U-062453, the other interests being held equally by Equipment Rental Service and Pacific Gas and Electric Company of California. Coastal States also owns 640 acres of fee coal land immediately north of the Federal coal leases SL-062583 and U-062453.

Forest Service and BLM lands currently unleased for coal, lie to the east and south of the proposed lease tract. Both agencies administer these lands for livestock grazing, wildlife habitat, watershed, mineral development, and dispersed recreation. The Forest Service and the BLM manage these lands under the concept of multiple use.

A state-owned section adjoins the southeastern portion of the proposed lease tract. This section is currently under grazing lease, oil and gas lease, and coal lease.

Fee lands adjoin the southern portion of the proposed lease area. This 160 acre tract is owned by Kemmerer Coal Company.

E. Present and Projected Demand for Mineral Material

Coastal States' existing federal leases contain an estimated 23 million recoverable tons of coal. An additional 6 million recoverable tons of coal are contained in their fee lands. Coastal States is currently producing 1.5 million tons of coal per year, a rate that will deplete their existing reserves in approximately 20 years. Existing contract demands that consume the 1.5 million tons-per-year currently being mined include the following:

ERDA	57,000 tons
Nevada Cement Company (80,000 tpy for 2 years)	160,000 tons
The Flintkote Company	
Calaveras Cement (205,000 tpy for 5 years)	1,025,000 tons
U.S. Lime Division (75,000 tpy for 5 years)	375,000 tons
Kennecott Copper Corporation (264,000 tons for 1st year) (430,000 tpy for 3 remaining years)	1,554,000 tons

Riverside Cement Company 900,000 tons
(300,000 tpy for 3 years)

Salt River Project 2,688,000 tons
(537,600 tpy for 5 years)

A long-term contract has been established with Sierra Pacific Power Company to provide 17.5 million tons of coal over a 22-year period commencing in 1981. Sierra Pacific plans to use this coal its proposed Valmy Station in northcentral Nevada. An environmental statement is currently being prepared on Sierra Pacific's Valmy proposal by the BLM in Nevada. Existing reserves and production rates are not sufficient to continue existing contracts and meet the demands of the long-term contract with Sierra Pacific Power Company. The availability of reserves in the proposed lease area would allow Coastal States to increase production to 2.1 million tons-per-year. The combined reserves would be sufficient to meet the Sierra Pacific contract and would provide enough additional coal to supply all present customers for 15 to 20 years.

CHAPTER III

DESCRIPTION OF EXISTING ENVIRONMENT AND ASSOCIATED IMPACTS OF PROPOSED ACTION AND ALTERNATE OWNERSHIP

A. Geology and Topography

1. Existing Environment

The proposed lease area is in the Wasatch Plateau coal field which underlies a major portion of the Wasatch Plateau. The Wasatch Plateau is the northeastern most of the high plateaus of Utah. The plateau is a high tableland, forming part of the great highland rim of the Colorado Plateau region, which sweeps in a broad curve from western Colorado to southwestern Utah. It is connected with the other high plateaus on the south, and on the north it merges with the highland between the Uintah Basin and Wasatch Mountains. On the east the Wasatch Plateau is bounded by Castle Valley and on the west by the Sevier and Sanpete Valleys. The plateau surface is 8,000 to 11,000 feet above sea level and 3,000 to 6,000 feet above the lower land to the east and west.

The geologic formations of the Wasatch Plateau coal field range in age from Upper Cretaceous (80 million years ago) to lower Eocene (50 million years ago). Exposed formations include sandstone, conglomerate, shale, mudstone, and limestone. The cliff and slope topography of the plateau is generally a result of differential weathering on resistant and non-resistant rock units.

Several fault zones have been identified on the plateau. These faults are all of the normal type--that is, they involve the simple dropping of the beds on one side of a break in strata. The proposed lease area lies midway between the Joes Valley - Paradise fault zone to the east and the Musinia fault zone to the west.

The Wasatch Plateau coal field ranges from 7 to 20 miles wide and about 90 miles long. The field covers an area of about 1,100 square miles and includes parts of Carbon, Emery, Sanpete, Sevier, and Utah counties. Principal coal beds of the field occur in the lower 250 to 350 feet of the Blackhawk Formation of the Mesa Verde Group. Thinner beds occur in the upper part of the Blackhawk Formation and in the Ferron Sandstone member of the Mancos Shale, which underlie the field at considerable depths.

The proposed lease area lies near the southeastern edge of the Wasatch Plateau. The majority of the area is a gentle rolling surface that is terminated in the east and south by precipitous cliffs cut by Convulsion Canyon and the North Fork of Quitcupah Canyon.

A generalized columnar section of the rock units that underlie the proposed lease area is shown in Figure 8. This sequence of rock units is characterized by steep slopes and vertical cliffs that make the canyon walls almost inaccessible. The cliff forming units are the Star Point and Castlegate Sandstones. The coal-bearing Blackhawk Formation is situated between these two units.

The geologic structure of the proposed lease area is simple. The area lies between the Joes Valley-Paradise fault zone and the Musinia fault zone, however, the beds in the area are relatively undisturbed. Generally the rock formations have a strike that trends roughly northeast and have a shallow dip of about 250 feet per mile to the northwest. A few small faults, having vertical displacement of 3 feet or less, and joint sets that occur both parallel and perpendicular to the faults are expected to occur in the proposed lease area.

The coal seams that underlie the proposed lease area are located in the basal portion of the Blackhawk Formation of the Mesa Verde Group. (Figure 9.) The coal seam that is currently being mined and that would be mined in the proposed lease area has been referred to as both the Upper Hiawatha bed and the Upper Ivie bed. This bed varies in thickness from 7 feet to 16 feet in the area currently being mined, and generally averages 13 feet thick. Drilling data indicate that the bed generally thins toward the east and south and is 7 feet thick near the outcrop in the southern portion of the proposed lease area.

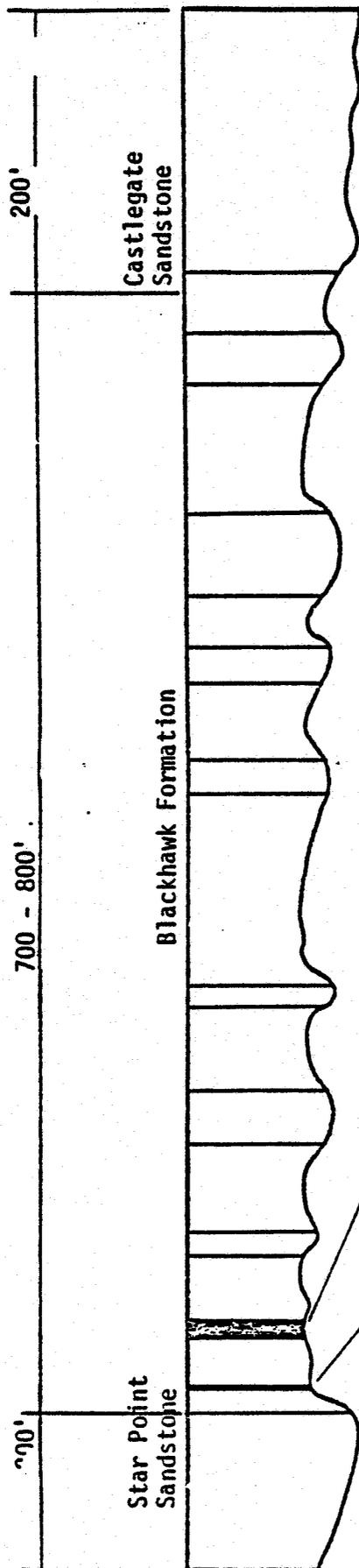
The Hiawatha bed, a 2 to 4 foot coal bed, is 15 to 25 feet below the Upper Hiawatha bed. Because of the thinness of this bed and its closeness to the Upper Hiawatha bed, it is not technically feasible to mine. Drill hole data in the proposed lease area indicate that this bed is 800 to 900 feet below the plateau surface.

Subsidence of the surface above areas that have been mined has occurred, and would be expected to occur on the proposed lease area. Coastal States has placed subsidence monitoring stations at strategic locations to monitor subsidence above active mining areas. Surface subsidence at the existing mine is expressed as fracture zones at the surface. These zones are generally a series of parallel fractures that roughly outline the mined area. Individual displacements along fractures are less than 1 foot vertically and laterally. Although not evident to the casual viewer, a vertical displacement of about 9 feet has been measured at the center of the subsided area (Figure 10). The visible evidences of subsidence are several fractures located adjacent to East Spring Canyon (Figures 11 and 12). Subsidence in this area is the result of underground mining at an 85 percent recovery rate.

Subsidence includes two stress-yield conditions resulting from excavation of coal resources: 1) Compression arches occur above and below the mine panels. Such stresses transfer the overburden load in coal-extraction areas to

		<u>Stratigraphic Unit</u>	<u>Thickness (Feet)</u>	<u>Description</u>
		UPPER CRETACEOUS	MANCOS SHALE	Masuk Shale
Emery Sandstone	800			Sandstone; yellow-gray color; fine to medium grained; some siltstone interbeds; forms ledges.
Blue Gate Member	1,600			Siltstone and claystone; blue-gray color; marine origin; forms slopes.
Ferron Member	50 - 900			Alternating yellow-gray sandstone; sandy shale; important coal beds; forms cliffs.

FIGURE 9
Coal Seams That Underlie The Proposed Lease Area



Castlegate Sandstone - light gray to white, medium to coarse-grained sandstone, conglomeratic.

Blackhawk Formation - gray to black shale, silty shale, and claystone, with abundant light gray, fine to medium-grained sandstone beds and lenses, sparse medium gray thin bedded siltstone.

Upper Hiawatha (Upper Ivie) Seam - averages 13 feet in thickness, thicker to northwest, thins toward southeast.

Hiawatha (Ivie) Seam - varies from 2 to 4 feet in thickness, lies 15 to 25 feet below Upper Hiawatha Seam.

Star Point Sandstone - light gray to white, fine to medium-grained burrowed sandstone with sortings and grain size increasing upwards.



FIGURE 10. Subsidence Area on Existing Lease

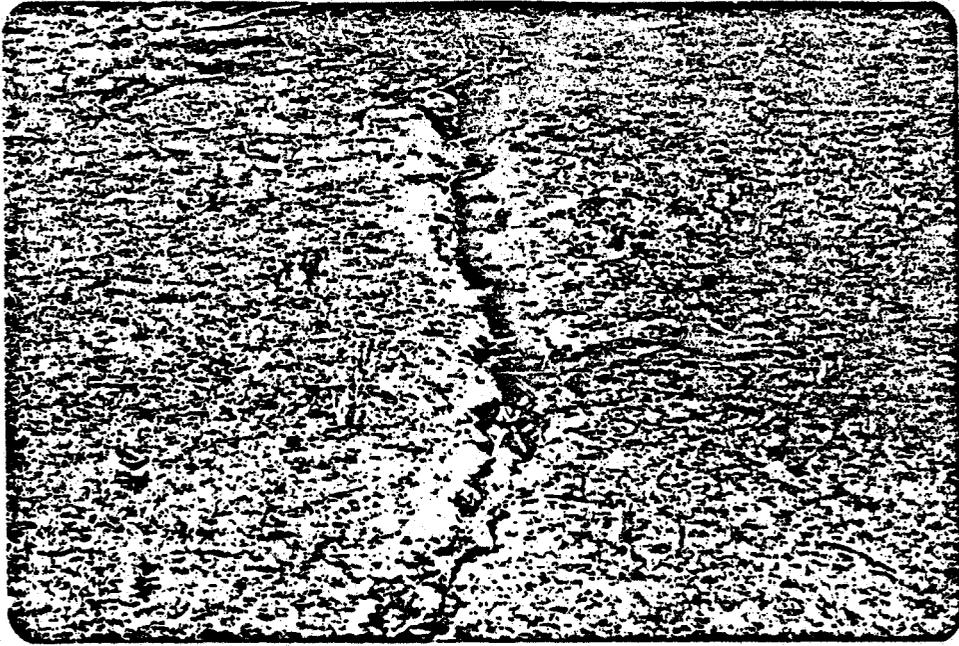


FIGURE 11. Fracture Zones on Existing Lease



FIGURE 12. Fracture Zone on Existing Lease

adjacent solid coal boundaries or barrier pillars. As extraction progresses, the compression arches migrate higher in the overburden strata and may eventually reach the surface. The rate of upward migration is a function of the thickness and strength of overburden strata, mining sequence, and duration and rate of mining. 2) Caving and flexure of strata into the mine cavities is caused by destressed zones within the compression arches. Flexure produces tensile and compressive stresses within lithologic units and shear stresses across lithologic boundaries (Dunrud, 1976).

2. Impacts of Coastal States Proposal

According to WESTECH (1977), approximately 35 percent or 922 acres of the proposed lease area has the potential of subsiding (Figure 13). Surface deformation of the proposed lease area would be expected to result from subsidence. This deformation probably would be broad depressions with associated fractures above the areas of subsidence activities. Maximum depth of these depressions would be 8 to 10 feet. Surface fractures would be the most visible manifestation of subsidence. Individual displacements along these fractures would not be expected to exceed 1 foot either vertically or in width.

The chronological sequence of surface deformation would be expected to occur as follows: (1) formation of tension cracks above barrier pillars a few months after mining; (2) appearance of compression bulges and anticlines on the surface about 1½ to 2 years after completion of mining; additional formation of tension cracks as the surface subsides to a final profile, several years after completion of mining (Dunrud, 1976; WESTECH, 1977). The two phase mining operation on the proposed lease area described in Chapter II would prevent subsidence on the canyon rims. Mining under the canyon rims would be restricted to room and pillar mining, with a recovery of between 30 to 40 percent of the coal. Burned areas of the coal bed along its outcrop below the canyon rims also limit mining in that area.

3. Impacts of Alternate Ownership

Impacts on geology and topography resulting from alternate ownership of the proposed lease tract would be similar to those identified in the Coastal States proposal. The effects on topography would depend upon location of surface facilities. Subsidence would occur on various portions of the proposed lease in relation to mining methods used and the amount of coal removed.

B. Mineral Resources

1. Existing Environment

a. Coal

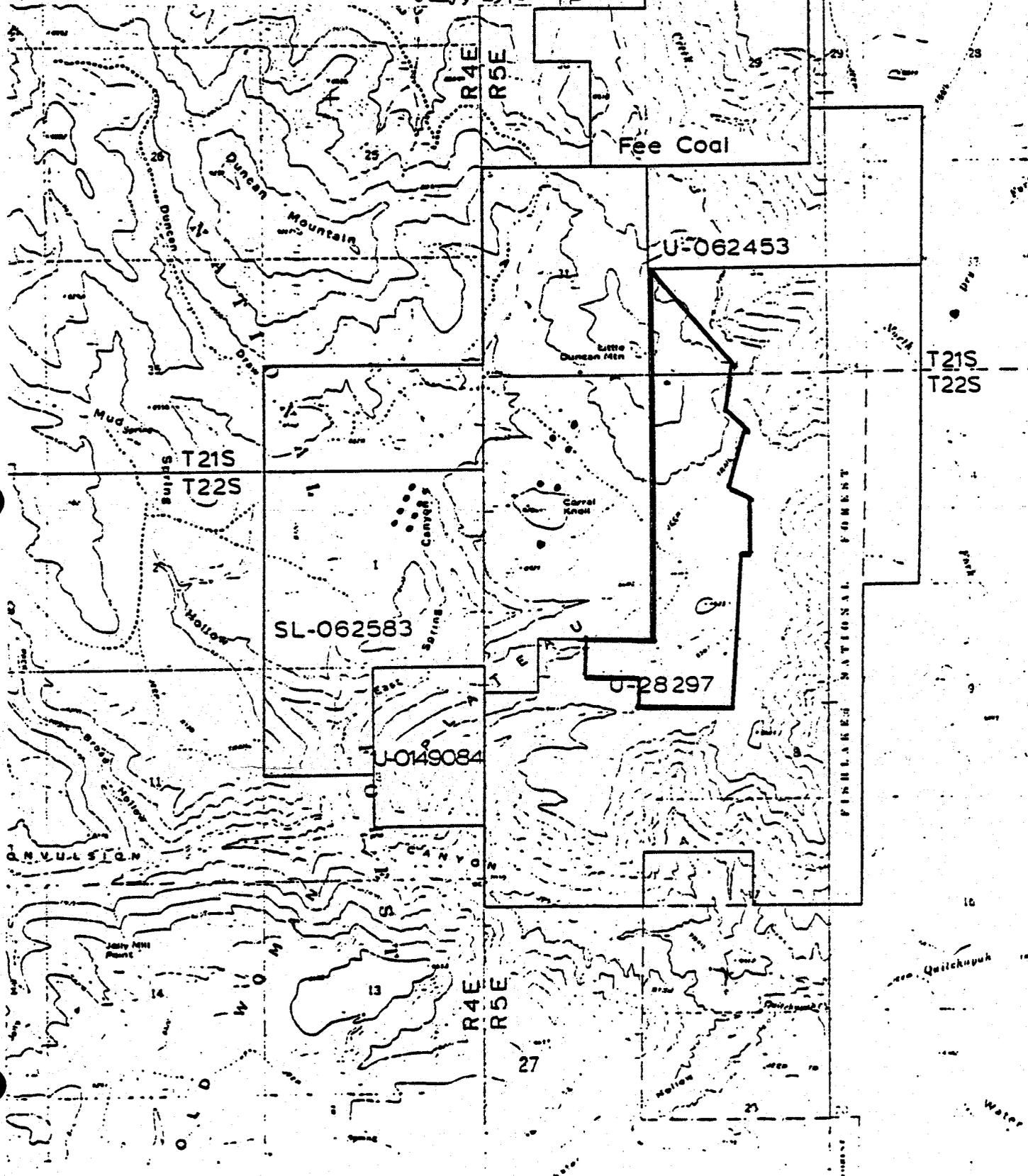
Numerous analyses of the coal of the upper Hiawatha bed that is currently being mined by Southern Utah Fuel Company are available in published information. The range of ash content is from 5.9 to 7.1 percent. Sulfur content ranges from 0.3 to 0.6 percent. The heat value of the coal ranges

FIGURE 13

Location of Subsidence Monitoring Stations
and Areas Susceptible to Subsidence
Monitoring Stations
Area Susceptible to Subsidence on
Proposed Lease Area



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from 11,390 to 12,260 Btu per pound. Coal that underlies the proposed lease area is expected to have similar characteristics (Doelling, 1972). USGS (1976) has calculated that measured coal in the Upper Hiawatha bed underlying the proposed lease area is 10.3 million tons; indicated coal reserves in the same bed are 10.9 million tons, for an aggregate tonnage of inplace reserves of 21.2 million tons.

Reserves on the underlying Hiawatha bed are 1.9 million tons of measured coal and 2.3 million tons of indicated coal for a total of 4.2 million tons (USGS, 1976).

Coastal States estimates that 14.0 million tons of coal are recoverable by present mining methods from the Upper Hiawatha bed that underlies the proposed lease area.

There are numerous areas where the Upper Hiawatha bed outcrops have burned in ancient times. Although the extent of many of these burns is unknown, some have burned as much as 750 feet into the coal seam. Burning is continuing on a portion of the existing lease, but will not affect the proposed lease area.

b. Oil & Gas

The proposed lease area is currently covered by noncompetitive oil and gas leases U-15641 and 15642, issued in 1972, and U-19063 and U-19064, which were issued in 1973. These leases are issued for a period of 10 years and will remain in effect for that period of time unless they are cancelled by the leaseholder or terminated for failure to pay the required rental fee. As of July, 1978, no drilling activity had been conducted on these leases.

The Ferron Sandstone Member of the Mancos Shale and the Dakota Sandstone, sedimentary units which underlie the proposed lease area, have been prolific producers of natural gas in other portions of the Wasatch Plateau. Entrapment of hydrocarbons in these units is a result of structural closure accompanied by lateral facies variation.

Oil and gas exploration in proximity to the proposed lease area has been limited. One test was drilled in 1952 within a few hundred feet of the proposed lease boundary. The well reached a depth of 3,973 feet and bottomed in the lower Mancos Shale. There were no reported oil and gas shows and three drill stem tests produced water.

c. Other Mineral Resources

No other mineral resources are known to exist within the proposed lease area. The area was reportedly explored for uranium in the early 1970's; however, no location notices have been found.

2. Impacts of Coastal States Proposal

a. Coal

Recoverable coal by the proposed mining methods would average 66 percent of the inplace reserves. Using this recovery rate, about 14 million tons

would be mined. The remaining 7 million tons of coal would be permanently lost.

b. Oil and Gas

Those sedimentary units that have produced oil and gas in the Wasatch Plateau, the Ferron Sandstone Member of the Mancos Shale and the Dakota Sandstone, lie more than 3,000 feet below the coal of the Upper Hiawatha bed. Although there would be no conflict between the two resources, future wildcat wells that may be drilled on the proposed lease area would require coordination efforts between Coastal States and the oil and gas company.

c. Other Mineral Resources

No environmental impacts are anticipated.

3. Impacts of Alternate Ownership

a. Coal

The recovery rate of coal reserves on the proposed lease area would be dependent upon the mining plan and the mining techniques used. Normal underground recovery rates range from 45 to 60 percent of the in-place reserves. This lower recovery rate would result from the necessity to leave barrier pillars between this operation and Coastal States' existing operation. The remaining coal would be permanently lost.

b. Oil and Gas

Environmental impacts associated with alternative ownership would be similar to those associated with Coastal States' proposal.

c. Other Mineral Resources

No environmental impacts are anticipated.

C. Hydrology

1. Existing Environment

The east side of the Wasatch Plateau, in which the proposed lease area lies, is in the Colorado River drainage. Annual precipitation ranges from less than 10 inches on the floor of Castle Valley to over 30 inches on the high plateaus (U.S. Forest Service, 1976). Most perennial streams of the Wasatch Plateau have their sources in the highlands. Ephemeral stream flows result from springs, seasonal snowmelt and precipitation.

Surface water quality degrades as it flows eastward into Castle Valley. Dissolved solids concentrations increase from less than 100 mg/liter in the highland streams to 3,000 mg/liter or more in streams of the valley floor. Sulfate concentrations increase similarly, from less than 50

mg/liter to more than 250 mg/liter. These trends are a result of a number of factors. Geologic formations encountered by stream waters, particularly less resistant shale strata, contain mineral constituents that are readily dissolved. Evapotranspiration along the water courses, return irrigation flow, and the influent seepage of highly mineralized ground water also contribute to the mineral content of stream water in Castle Valley (Price & Waddell, 1973).

The proposed coal lease area is in the drainage basin of Muddy Creek, a headwater tributary of the Dirty Devil River which empties into the Colorado River about 85 air miles southeast of the lease area. Muddy Creek receives runoff from the lease area by way of Convulsion Canyon and Quitchupah Creeks.

Convulsion Canyon and Quitchupah Creek are not currently gauged, however mean annual runoff from the approximately 6,200 acre lease area (currently under lease and proposed for lease) is intermittent and is estimated to be about 900 acre-feet (U.S. Geological Survey, Water Resources Division, 1977). A water quality monitoring program has been developed for the area, with sampling taking place during the spring and summer of 1978. Water quality sampling to date indicates waters of fair to good quality with low concentrations of metals and nutrients, little oxidizable organic matter, and low to moderate levels of dissolved solids (WESTECH, 1977).

Ground water is present in most rock units that underlie the area. Although most units have some degree of permeability, most water enters the units by deep seepage of precipitation that falls on the surrounding plateaus. This water moves down gradient through interstices (pores, fractures, etc.) in the rocks and is either stored there or discharged as seeps, springs, or streams. Geologic structures apparently have control on the movement of ground water in the lease area (WESTECH Report, 1977). Two springs located on the existing lease are near the proposed lease area and may be affected by subsidence. These springs have been developed and are used by livestock and wildlife. No springs are located on the proposed lease area.

Overall consideration of the probable ground water flow patterns indicates that water is probably contained in the overlying sandstone members of the Price River Formation, particularly the basal Castlegate Sandstone, and in the sandstone members of the Blackhawk Formation which overlie the Upper Hiawatha coal bed. Despite the presence of aquifers above the workings, the Convulsion Canyon Mine has remained essentially dry because the sandstone sequence contains several shale and silt members which serve as aquicludes to retard the vertical percolation of ground water and form a perched aquifer above the coal (WESTECH, 1977).

Minor faults encountered in the mine have breached the integrity of the aquicludes and allow vertical percolation into the mine. Faults in existing workings produce water, some of which is diverted from the mine into East Spring Canyon.

The depth to the regional water table (main zone of saturation) in the area is not known. Coal seams being mined are above the regional water table near their outcrop areas, but probably extend beneath the water table (into the main zone of saturation) to the north and west of the existing lease area (WESTECH, 1977).

Chemical quality of ground water in the area is good. According to Price and Waddell (1973), dissolved solids concentrations of ground water in this area are generally less than 500 mg/liter. Samples collected in July 1975 from West and East Springs, which discharge from faults intersected by present mine workings, contained 406 and 428 mg/liter of dissolved solids respectively (Southern Utah Fuel Mine Plan, 1977). Water discharged from the mine was sampled September 27, 1976 by the U.S. Geological Survey and contained only 276 mg/liter of dissolved solids.

Occasional high intensity summer thundershower activity in the area contributes to flooding in the canyons that surround the proposed lease area. Data on flood flows and the frequency of flooding in the area are not available.

2. Impacts of Coastal States Proposal

There would be no new surface construction and only minimal surface disturbance as a result of exploratory drilling; therefore, no increase in runoff or fluvial sedimentation is expected. Subsidence and the associated rock fracturing following mining would increase ground water recharge rates. Surface water quality would be expected to be comparable to that of existing sources.

Subsidence and the associated rock fracturing may provide additional avenues for water to enter the ground water system. Several aquicludes exist above the coal being mined that retard the vertical percolation of ground water. A particularly effective seal is obtained by a 20-foot thick stratum of bluish-gray bentonitic shale that directly overlies the Upper Hiawatha coal bed. Drill data indicate the bentonitic layer is continuous throughout the proposed lease area. Existing faults have breached this aquiclude and have created a hydraulic connection between water-bearing zones that occur above the coal bed. Subsidence after mining may breach this aquiclude and provide additional avenues for hydraulic connection of water bearing zones. Water zones in the area are currently fresh; however, the creation of additional avenues for water movement increases the potential of raising the dissolved solids concentrations of the water, thus reducing its quality.

Flows of two upland springs or seeps, located near the proposed lease area, may be reduced by loss of ground water to the fracture zones. If water flow from the springs is reduced or stopped, it is doubtful that flows would ever return to former levels even if the aquifer recharged itself.

Mining operations on the proposed lease area would not be expected to encounter water problems. As mining operations encounter fault zones or perched water tables, water would be released into the mine and pumped out. However, judging from flows encountered in the existing operations, these water zones are quickly depleted.

Issuance of the lease and subsequent activities would have no impact on the flood potential of the area. No facilities would be constructed in any of the drainage bottoms in the area.

3. Impacts of Alternate Ownership

Environmental impacts on surface and subsurface hydrology would be similar to those which would be associated with the Coastal States proposal.

The additional surface disturbance associated with developing new mine facilities, associated access roads, etc. (approximately 75-100 acres) would increase potential runoff and fluvial sedimentation. Intensity and significance would depend on location of the disturbance.

Alternative ownership of the proposed lease would not increase the flood potential of the area; however, mine sites, access roads, etc. could be subject to flood damage depending on their location. The 75-100 acres of disturbed soils could slightly increase runoff.

D. Soils

1. Existing Environment

Soils on the plateau are generally very shallow, sand to silty sand in texture, with high percolation rates. Rocks exposed at the surface are alternating layers of sandstone and shale. Beds of coal and limestone are also exposed. Soils are highly susceptible to wind erosion but inherent erosion hazard from water is low (WESTECH, 1977). Mancos shale dominates the canyon bottoms.

No prime or unique farmlands, flood plains, or alluvial valley floors are located on the proposed lease area or in the general area.

2. Impacts of Coastal States Proposal

A total of 3 to 5 acres of topsoil would be disturbed by exploration activities. If the lease is issued, most of this disturbance would occur during the first field season. A maximum of 12 drill sites (40 x 60 feet) would be prepared along with approximately 1 mile of new low-grade road. These disturbances would be short-term in duration as similar drill sites on the plateau have revegetated within 2-3 years after rehabilitation (Figure 14).

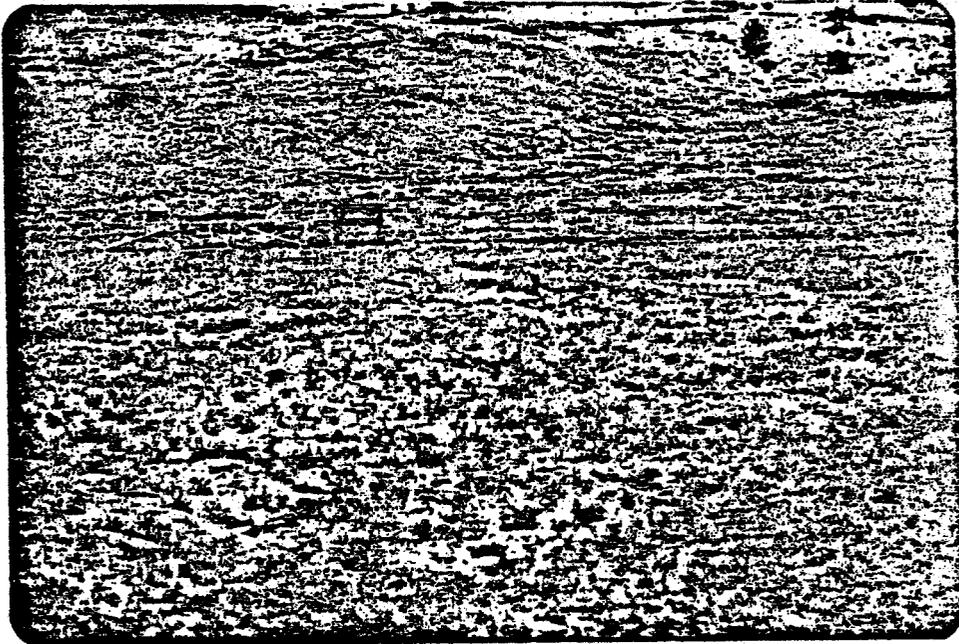


FIGURE 14. Revegetated Drill Site

3. Impacts of Alternate Ownership

Between 75-100 acres of surface disturbance could be anticipated should alternate ownership and development of the lands occur. Part of this disturbance would be short-term as described above; some disturbance would be long-term and extend for the duration of the mining and beyond. These areas would include permanent access roads, mine sites, etc. Increased erosion at construction sites would be inevitable during the period of soil exposure, particularly during intense rainstorms. Studies in the area indicate that approximately 1.5 to 4.0 cubic yards of soil per acre per year could be eroded during the period of soil exposure. This is 1.0 to 3.0 cubic yards per acre per year above the natural rate of erosion (Pacific Southwest Inter-Agency Committee System, 1968). After rehabilitation is completed, erosion rates would probably decline to near normal levels as vegetation becomes established.

Productivity of disturbed and occupied soils would be lost for the duration of the disturbance.

E. Climate, Air Quality, Noise

1. Existing Environment

Annual precipitation in the proposed lease area averages 12 to 16 inches. The majority of the precipitation occurs as winter snow, but high intensity thunderstorms which occur between July and September also contribute to the precipitation total (WESTECH, 1977).

Temperatures range from the 95° F during the summer months to as low as -20° F during the winter. There is a maximum of four frost-free months. The nearest wind reporting weather stations, Green River and Hanksville, are not representative of this area due to distance, elevation, and terrain differences. Prevailing winds are basically up-canyon from south-southwest to north-northeast. During summer months winds are light except during thunderstorm activity. During frontal passage, strong winds (25 - 40 mph) occur (WESTECH, 1977).

Although no known air samples have been taken in the vicinity of the lease application, air quality appears to be good. The limited air pollutants present are the result of motorized vehicles traversing the area, but these pollutants are quickly dissipated.

Offsite air quality in the vicinity of the Convulsion Canyon Mine is being polluted by engine emissions from the haulage of coal along the 10 mile paved road from the mine to Interstate 70.

There are no background noise data for the area. However, current noise levels are assumed to be within existing State and Federal guidelines.

2. Impacts of Coastal States Proposal

Climate would not be affected by the proposed action. Some temporary reduction in local air quality (particulate matter) could be anticipated during exploratory drilling activities on the proposed lease. This drilling activity would be completed within a 4-month period, thus any reduction in current air quality would be limited to this period.

Trucks would continue to produce exhaust emissions. Exhaust levels would be slightly increased as truck traffic would increase an average of 1.5 trucks per hour. Truck traffic would also be on the haulage road an additional 1½ years.

Localized sources of noise would be anticipated during the 4-month exploratory drilling program. The noise level would not be otherwise affected by the proposed action.

3. Impacts of Alternate Ownership

Climate would not be affected by alternate ownership of the proposed lease area.

An undetermined reduction of air quality could be anticipated during all phases of mine development, including road and powerline construction, construction of surface facilities to support the underground operation, and exploratory drilling. Haulage of coal from the new mine portal would produce additional amounts of dust and engine emissions.

All phases of new mine development would increase noise levels in the area an undetermined degree.

F. Fire

1. Existing Environment

Wildfire is a natural occurrence in the vicinity of the proposed lease area. Two to three fires start every year from lightning. The fires are mostly small because of patchy fuels and may burn out before they are detected. Man-caused fires have been of little concern because of the low level of use in the area. The fire hazard is greatest during July through October.

2. Impacts of Coastal States Proposal

The proposed action would introduce a higher man-caused fire risk in the area, resulting from increased personnel in the field. This would be a short-term effect occurring mostly during the single 4-month summer field season.

3. Impacts of Alternate Ownership

The possibility of man-caused fires would increase as a result of men and equipment working in the area. These additional people would be in the area at least 25 years. They would also provide earlier detection of fires started by man or nature.

G. Fish and Wildlife

1. Existing Environment

There is a variety of wildlife in the vicinity of the proposed lease area. Better known species include: mule deer, elk, cougar, black bear, jackrabbit, cottontail rabbit, snowshoe hare, red squirrel, chipmunk, pocket gopher, wood rat, coyote, bobcat, badger, and several species of birds including golden eagle, blue grouse, ruffed grouse, mourning dove, common flicker, robin, mountain blue bird, chickadee, Steller's jay, and pine siskin (Dalton et al, 1977; USFS, 1976).

The proposed lease area is in deer herd unit 45 (Last Chance - Quitchupah) and elk herd unit 14 (Fishlake). The area receives considerable hunting pressure for deer and elk. During the 10-year period 1967-1976, an average of 729 deer hunters and 1,072 elk hunters were afield on these units annually (UDWR, 1977). The area of the proposed lease includes deer summer and winter range and the area is an elk winter concentration site. Elk calving areas are northwest of the proposed lease area. Major northwest-southeast migration routes for deer and elk traverse the area, and uses such as Interstate 70, the coal haul road, and Acord Lakes subdivision create a migration barrier (USFS, 1976). Range studies have identified carrying capacity for deer winter range in the area. The pinyon-juniper type will support .07 deer per acre; the sagebrush-grassland type will support .12 deer per acre; and the mountain shrub type will support .25 deer per acre. Presently the limiting factor for deer and elk is the lack of adequate winter range (personal correspondence, Larry Wilson, Regional Supervisor Southeastern Region, Utah Division of Wildlife Resources, November 2, 1977). Deer highway mortality on I-70 in Salina Canyon averaged 100 deer annually during the period 1970-1976 (UDWR, 1977). Some deer are killed along the Coastal States access road; however, data on this mortality are not available.

The intermittent flow of streams in the proposed lease area does not support fish.

No resident threatened or endangered species are known to inhabit the proposed lease area, but bald eagles are winter visitors in the area. It is believed that they utilize escarpments in the area during winter months for roosting purposes. No bald or golden eagle nests are known to exist in the area (Boner, et al, 1977).

Impacts to threatened and endangered species would not be anticipated.

H. Vegetation

1. Existing Environment

The following major vegetation communities have been identified in the proposed lease application area:

Pinyon/Juniper Woodland
Sagebrush/Grassland
Ponderosa Pine
Mountain Shrub
Mixed Conifer
Aspen

Community distribution is a function of climatic variables, land form (slope and aspect), soil conditions, elevation, fire, and past and present land-use patterns (mainly grazing and logging). A description of the vegetation communities follows:

Pinyon/Juniper Woodland

In the proposed lease area, Pinyon/Juniper Woodland is found on steep slopes at lower elevations of Quitchupah Creek, East Spring Canyon and Convulsion Canyon.

Pinyon and juniper vary in coverage in the overstory with almost pure stands of juniper in some areas. Understory in this type is generally sparse consisting of bluebunch wheatgrass, Indian ricegrass, and several forbs including yarrow, Indian paintbrush, comandra, and daisies.

Sagebrush/Grassland

The plateau and slopes above the steep canyon walls are dominated in large areas by the Sagebrush/Grassland community. Big sagebrush and low sagebrush are dominant shrubs. Bitterbrush and rabbitbrush are often associated with this type. Common grasses in this community include slender wheatgrass, Letterman needlegrass, needle-and-thread grass, western wheatgrass, prairie junegrass and sedges.

Ponderosa Pine

The Ponderosa Pine community is found on benches and plateaus above the Pinyon/Juniper Woodland. It is also found at the head of several draws in the lease area. Commonly associated with the pine are mountain mahogany and manzanita.

Logging has occurred in many of the pine stands and is continuing. Larger old-growth pine are being harvested. Pine regeneration is sparse and openings created by harvesting are being invaded by mountain mahogany, manzanita, and other shrubs.

The proposed lease area is in the known and suspected breeding distribution of the endangered peregrine falcon (Porter and White, 1973). Because of the low population of this species, it is unlikely that any nests would be found in the lease area. There have been no recent sightings of peregrines in the lease area (Lowry, 1978).

2. Impacts of Coastal States Proposal

The exploratory drilling program would temporarily displace wildlife species locally. Mule deer which utilize the area during the summer would be displaced; however, elk are found in the area only during winter months and would not be disturbed. Wildlife would be displaced by the exploratory drilling for about 4 months during the summer.

Road and drill pad construction would cause the loss of 3 to 5 acres of vegetation normally used by wildlife for food and cover. This loss would continue until revegetation is successful (2-3 years). Loss of this vegetation would reduce the carrying capacity for deer by one deer (or less) annually. Loss or reduction of spring flows would not significantly affect deer or elk since they are in the area during winter when snow provides water. Less mobile species or amphibians that may be associated with the springs would be displaced or lost if flows cease. The number that would be affected is not known; however, populations are small. Wildlife highway mortality would increase because of pavement of the coal haul road and increased traffic associated with the higher rate of coal production. Highway mortality is directly related to degree of road improvement and volume of traffic (McClure, 1951; Oxley et al, 1974). Deer highway mortality on I-70 in Salina Canyon could increase by as much as 16 percent or 16 deer annually.

The proposed action would not be expected to adversely affect the endangered bald eagle or peregrine falcon which may occur in the area.

3. Impacts of Alternate Ownership

The environmental disturbances described above would be increased both in space and in duration. Estimated surface disturbance would be between 75-100 acres. Much of this land would be lost over the long term as it would be occupied by haulage roads, mine site, etc. Wildlife populations would be reduced in those areas which immediately surround areas of heavy and sustained human activity.

Mule deer and elk could be displaced from 75 to 100 acres of traditional habitat occupied by new mine development. This would represent loss of summer or winter range for mule deer and loss of winter range for elk. Disturbance in the area of elk calving grounds during the period from May through June would cause the loss of elk calves. The area and extent of loss cannot be predicted because of the lack of specific data for alternate ownership and development. If 100 acres of surface disturbance occurred on deer winter range, the lost carrying capacity for deer would range from 7 to 25 deer annually. This impact would continue for the life of the mine.

The location of these impacts, duration, and species affected cannot be determined until mine locations, size of operation, road routes, etc. are known. Increased deer highway mortality on I-70 in Salina Canyon would be similar to that associated with the Coastal States proposal.

Mountain Shrub

This type is a combination of the scrub oak type and the curleaf mountain mahogany type. These two species may occur as separate stands or growing together. Topographically, the mountain shrub type is found above the Pinyon/Juniper Woodland and below the Aspen type.

Mixed Conifer

The Mixed Conifer type is found on steep north or east aspects along Quitchupah Canyon and on the north side of Little Duncan Mountain. White fir, Douglas fir and Ponderosa pine are dominant in the overstory. On wetter sites and along perennial drainages, Engleman spruce is found.

Aspen Type

Aspen communities are common above 8,500 feet elevations on north and east aspects and in some swales at various aspects. Snow accumulation appears to be an important factor in aspen distribution. Understory vegetation in this type is mainly shrubs and forbs. Snowberry, wild rose, chokecherry, willow, and serviceberry are common shrubs in the aspen type. Common forbs include yarrow, meadow rue and osmorhiza (WESTECH, 1977). No riparian vegetation is found on the proposed lease area.

A report on threatened and endangered plant species in the Richfield District was completed by Dr. Stanley L. Welsh of Brigham Young University in 1976. Information from this report was correlated specifically to the proposed lease area by specialists within the BLM in April, 1978 (See attached report, Appendix 1). No proposed threatened or endangered plant species are known to exist on the subject lands; however, habitats and elevations of proposed threatened and endangered plants within the district and Sevier County were correlated to similar habitats on the proposed lease area (Welsh, 1977). List 1 and 2 of Appendix 1 show those plants that may exist within the proposed lease area. After consultation with Dr. Welsh, the following species were determined most likely to occur within the proposed lease area:

Astragalus loanus Threatened
Festuca dasyclada Possibly Extinct
Hymenoxys depressa Threatened
Penstemon abietinus Threatened
Penstemon wardii Threatened
Sclerocactus wrightiae Endangered
Townsendia aprica Endangered

All of these species are presently on the proposed threatened and endangered list for Utah. However, Astragalus loanus and Penstemon

abietinus have been recommended to be removed from the list (Welsh, 1978). Dr. Welsh indicated that the top edge of the rimrock, which runs north and south across the proposed lease area, has the greatest potential for the existence of proposed threatened or endangered plant species.

2. Impacts of Coastal States Proposal

Approximately 3 to 5 acres of vegetation, mostly shrubs and forbs, would be removed as a result of drill pad and access road construction. As has been the situation with similar drilling activities in the area, this disturbance would be temporary and these areas would be brought back into productivity in 2-3 years after rehabilitation.

If the two springs adjacent to the proposed lease area dry up as a result of mining activities, vegetation surrounding the springs would die out and be replaced by a dryland vegetative type. Less than $\frac{1}{2}$ acre of vegetation could be affected. Proposed threatened and endangered plants would not be affected as those possibly in the area are all dry land species.

The probability of encountering proposed threatened and endangered plants on the proposed lease area is low. However, environmental conditions of the lease area are similar to nearby areas which are known to contain proposed threatened or endangered species.

3. Impacts of Alternate Ownership

Vegetation would be disturbed on 75-100 acres of land. Disturbance of areas used for haulage roads, mine sites, etc. would continue for the life of the mine. It would be several decades before this land would be rehabilitated. The remainder of the disturbance (those areas used for drill sites and temporary access roads) would be short term, (1-5 years) and the land would be returned to productive levels within 2-3 years after rehabilitation.

Impacts to vegetation resulting from alternate ownership would be similar to those identified in the Coastal States proposal. Because of increased surface disturbance from developing a new mine, the likelihood on encountering proposed threatened or endangered plants would be increased.

I. Socioeconomic

1. Existing Environment

In 1970 the population of Sevier County was 10,103 and presently it is estimated at 13,200. This county has experienced a sustained growth in recent years. The nearest community to the Coastal States Mine is Salina. Salina, with a population of 1,800, has a small shopping area, one doctor 2 days a week, a medical clinic, it's own water and sewage treatment system, three local policemen, and a volunteer fire department. Presently, homes can be bought in Salina, and its outlying areas. Population growth is expected to continue in Sevier County as a result of increased mining and economic development.

The 1973 per capita income estimate for Sevier County was \$3,584 which is below the State average. The economy of Sevier County is primarily based on mining (gypsum, clay, salt, and coal), agricultural products, and manufacturing.

Ethnically and religiously, Sevier County communities are almost entirely white and mostly Mormon.

Richfield has a new hospital and a new county courthouse which serve Salina. Salina citizens in anticipation of future growth have extended the sewer lines. The people want job opportunities in the area largely because they want their sons and daughters to remain in the area. The major concern is for housing.

2. Impacts of Coastal States Proposal

Coastal States would hire an additional 51 employees. All of these positions would be filled by the local population in Sevier, and perhaps, Sanpete Counties.

The city and county tax base and total regional income associated with continued coal mining would contribute to the Salina and general Sevier County business economy. Increases in the work force at the mine would increase the total regional income.

These additional jobs would induce some of the local young people, who would normally leave the area, to stay as well as providing additional sources of income for long-time residents. Support businesses such as food stores, gasoline stations, restaurants, etc., would benefit since much of the anticipated additional income would be spent locally. No significant housing shortages would be anticipated.

3. Impacts of Alternate Ownership

Socioeconomic impacts are difficult to define since no proposal for another mine in the area has been made. Therefore, the number of people and kinds of equipment involved are not known. It can be assumed that the impacts would be similar to other mines in the general area. Approximately 150 employees would be involved. An undetermined number of "outsiders" would probably move into the area bringing extra incomes and causing possible housing shortages.

J. History, Archaeology, and Paleontology

1. Existing Environment

No significant archaeological or cultural sites have been identified in the proposed lease area by USFS and BLM archaeologists. Archaeological values found in the area consist of scattered chipping sites. These do

not represent significant scientific values. No National Register Properties are found on the proposed lease area (Archaeological Report, 1977; see Appendix 2).

The only known historical site in the general area is Jack Hadley's Monument. It is located on Coastal States' existing lease, between Mud Spring Hollow and East Spring Canyon. No historical values are known to exist on the proposed lease area.

Invertebrate fossils are found in most of the stratigraphic units that comprise the Wasatch Plateau coal field. Numerous invertebrate fossils have been found in the Emery Sandstone Member of the Mancos Shale. Poorly preserved fossil plants have been collected from the Black Hawk Formation. Brackish water fossils have been collected from the shale beds in the upper part of the Castlegate Sandstone Member of the Mesa Verde Group. No specific data on fossils within the proposed lease area are available (Spieker, 1931).

2. Impacts of Coastal States Proposal

Archaeological values consisting of scattered chipping sites could be encountered during Coastal States' exploration drilling program. The probability of destroying these values is low as only 3-5 surface acres would be disturbed. Paleontological values would not be expected to be encountered.

3. Impacts of Alternate Ownership

Although site-specific, surface-disturbing activities associated with a new mining operation have not been identified, the potential exists for encountering archaeological values consisting of scattered chipping sites. It is anticipated that 75-100 acres of surface disturbance would occur. It is not known whether or not paleontological values would be encountered.

K. Public Health and Safety

1. Existing Environment

All underground mining operations would be conducted in accordance with Federal and State mining regulations. Only proven methods of coal extraction would be utilized.

2. Impacts of Coastal States Proposal

Coal truck traffic would increase from an average of 9.6 trucks per hour to 11.1 trucks per hour for the life of the mine.

3. Impacts of Alternate Ownership

Truck traffic would be substantially increased should an alternate owner obtain the lease. This increased traffic would not increase dust, however, because the road would be paved before coal haulage from a new mine would begin.

L. Timber Management

1. Existing Environment

The timber species on the proposed lease area is Ponderosa pine. Commercial stands occur on the flat benches in the area. The trees are generally of low quality and cutting is limited to older, over-mature trees. The harvesting of these trees is on a small scale. The proposed lease area contains an estimated total of 1 million board feet of timber. Aspen stands are also found on the proposed lease area but have not been harvested due to the lack of a viable market.

2. Impacts of Coastal States Proposal

The timber resource on the proposed lease area would not be affected by Coastal States' proposal because no tree removal would occur.

3. Impacts of Alternate Ownership

Although site-specific developments of an alternate owner are not known, the timber resource could be adversely affected should an alternate owner receive the lease. The possible development of access roads and surface facilities on the benches of the lease area could require removal of an undetermined amount of timber.

M. Range Management

1. Existing Environment

There are portions of three grazing allotments within the proposed lease area. The approximately 260 acres in the Manti-LaSal National Forest are in the Emery C & H Allotment. All of this land is located in the North Fork Quitchupah Canyon. It is extremely steep and is classified as unsuitable range. No livestock graze this area and there are no range improvements. The approximately 160 acres of BLM administered lands in the proposed lease area are in the Johnson Allotment. This allotment is maintained on a custodial basis and no range improvements are located in the vicinity of the proposed lease. The remainder of the proposed lease area is located in the Quitchupah C & H Allotment, Fishlake National Forest. The Allotment is presently managed under a rest-rotation grazing management system. Structural range improvements include one watering trough on the proposed lease area and two cattle guards on the access route into the lease.

2. Impacts of Coastal States Proposal

Less than 1 percent of 2 AUMs would be temporarily lost as a result of Coastal State's exploration activities. No existing range improvements would be affected. Reduction or loss of flows from the two springs near the proposed lease area would alter distribution of grazing livestock. The number of cows that could be affected is not known. Additional pressure would be placed on other water sources in the area.

3. Impacts of an Alternate Ownership Proposal

An undetermined amount of forage would be temporarily taken out of production because of the development of the access and haulage roads, and new mine facilities. However, assuming that 100 acres of forage were taken out of production, the result would be the loss of about 7 AUMs. This would constitute 3.7 percent of the total AUMs in the affected allotments.

N. Recreation-Aesthetics

1. Existing Environment

Due to the steep nature of the proposed lease area, recreation activities are limited. The major recreational activity is big game hunting, which occurs over a 1-month period in the fall of each year. No developed recreation facilities are located on the proposed lease area.

The Fishlake National Forest Salina Land Use Plan describes the aesthetic variety of the lease area as having mesa and canyon landforms of distinctive variety. Color variation is well stratified and adds greatly to the landform variety. Variations in the vegetative patterns range from sagebrush mesas to the pine covered edges and mahogany slopes. Water features are minor, located mainly in the canyons. The mesa rim and deep canyons can be seen as background from Dog Valley.

2. Impacts of Coastal States Proposal

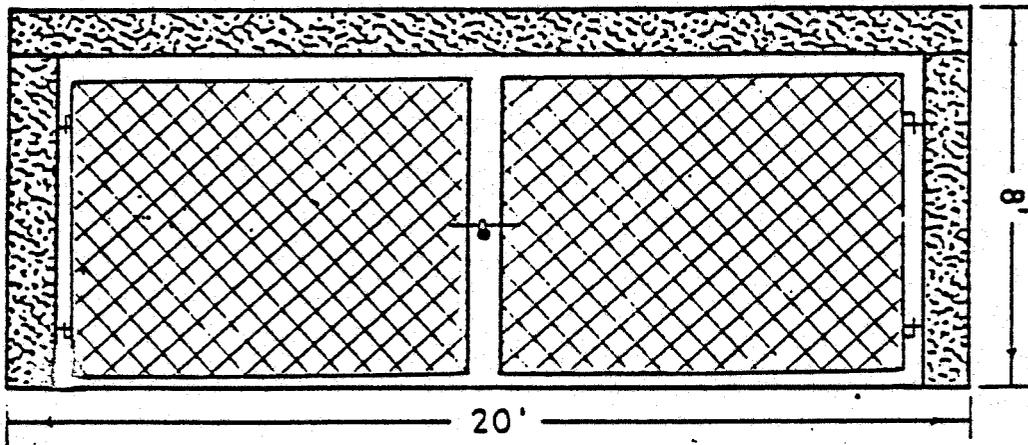
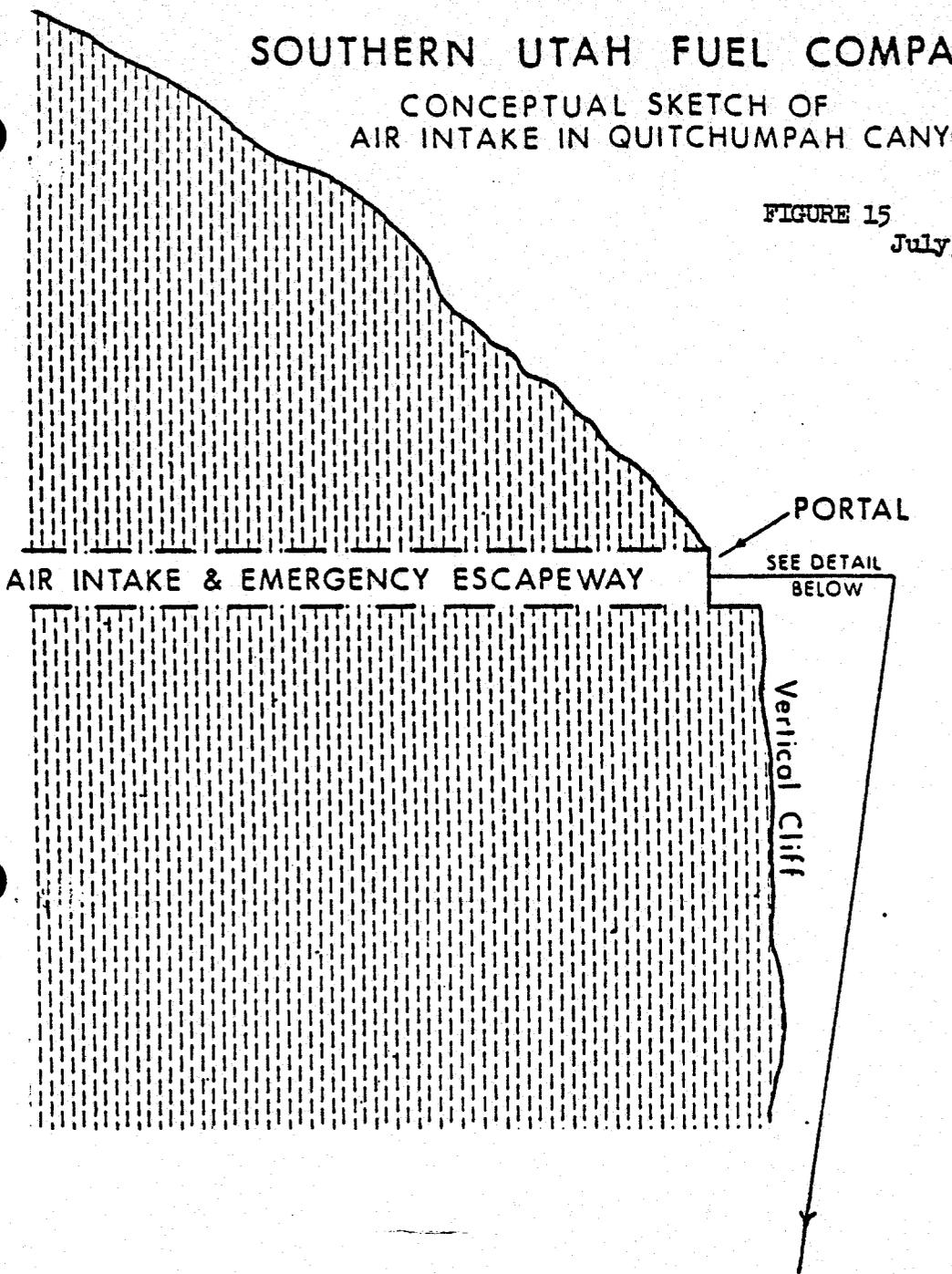
Construction of four air intake portals on the vertical cliffs of Convulsion and Quitchupah Canyons would alter the visual quality of the existing topography in the immediate area of the portals. Extent of construction and surface manifestation would be limited to an 8 foot by 20 foot opening enclosed by a wire covering (Figure 15). Because

SOUTHERN UTAH FUEL COMPANY

CONCEPTUAL SKETCH OF AIR INTAKE IN QUITCHUMPAH CANYON

FIGURE 15

July, 1978



the portals would be constructed from inside the mine, no access roads would be required. Total disturbance on the cliff face would be less than one-half acre but would constitute a permanent alteration. Lease issuance would not be expected to interfere with hunting activities in the area.

3. Impacts of Alternate Ownership

Activities associated with alternate ownership could affect the aesthetic quality of the area. The building of access roads onto the lease area and the construction of new surface mining facilities would be intrusions on the existing aesthetic qualities. 75-100 acres of surface disturbance could be expected. It is not known how much, if any, interference with hunting activities would occur if the lease was issued to another owner.

0. Transportation

1. Existing Environment

Access to the proposed lease area is provided by the Convulsion Canyon Road, a paved road which leads from Interstate 70 to Coastal States' existing mine. Access to the surface of the proposed lease tract is provided by Forest Service maintained roads. There are approximately 4 miles of low-standard dirt roads within the proposed lease area. Numerous jeep trails traverse the gentle slopes and flat benches of the lease area.

The Convulsion Canyon Road is utilized for moving all materials to the existing mine and hauling the coal from the mine.

Coal is hauled by truck to railroad sidings in Salina and Levan, Utah where it is loaded on trains for shipment to customers in the West and Southwest.

2. Impacts of Coastal States Proposal

Frequency of truck travel would be increased from 9.6 trucks per hour to 11.1 trucks per hour, which represents an increase of about 16 percent in coal transportation traffic. This figure assumes that a production level of 2.1 million tons per year is reached and maintained, and that the haulage fleet is converted, within the limit of recently revised State statutes and regulations, from 26 ton to 33 ton capacity trucks. The trucks would run 6 days a week, 20 hours a day.

3. Impacts of Alternate Ownership

The impacts of coal transportation from a new mine would depend largely upon mine production rates which are currently unknown. It is assumed, however, that if production rates were similar to those of Coastal States', coal haulage requirements would be the same.

P. Research, Administration and Special Uses

1. Existing Environment

An administrative study area covering about 40 acres is immediately west of the proposed lease area. It is on Coastal States' existing Federal lease and consists of contour trenching on the west side of Little Duncan Mountain. The study was initiated a number of years ago to evaluate the effects of contour trenching on vegetative growth.

Utah Power and Light Company has a Special Use Permit which allowed them to construct a 69 KV power line from Emery, Utah to the existing Convulsion Canyon Mine. This line runs up the bottom of Quitchupah Creek and crosses a corner of the proposed lease area.

2. Impacts of Coastal States Proposal

The administrative study area would not be affected by the Coastal States proposal. The power line that crosses a portion of the proposed lease area would not be affected because it is not underlain by minable coal.

3. Impacts of Alternate Ownership

No impacts would be anticipated.

Q. Wilderness and Roadless Areas

1. Existing Environment

No designated wilderness areas are located in or near the proposed lease area.

All 263 acres of the proposed lease area located on the Manti-LaSal National Forest lies within the boundaries of the Wildcat Knolls No. 4-227 inventoried RARE II area, 5,800 acres in size (Figure 16). The major topographic feature of this area is Quitchupah Canyon.

The Forest Service roadless area review & evaluation (R.A.R.E. II), is the process used to determine which of the inventoried roadless areas should be; recommended to Congress for inclusion in the National Wilderness Preservation System; should be managed for non-wilderness uses; or which require further planning before a resolvable decision can be made. These areas were identified through applying minimum "criteria for wilderness consideration" under the Wilderness Act. RARE II is being

accomplished in conjunction with the preparation of the Ferron-Price Land Management Plan that is scheduled for completion in the fall of 1978. Interim activities are allowed in these RARE II areas as long as they do not detract from or impair the wilderness characteristics of the area.

Approximately 985 acres or 18 percent of the Wildcat Knolls RARE II area is currently under lease to Coastal States or is fee land. Approximately 50 of the 263 acres of the proposed lease in the RARE II has potential for underground mining. Much of the coal in this area has been burned, although it is not known how far into the coal seams the burn extends.

Due to existing intrusions, such as regularly maintained roads, permanent surface structures, etc., no RARE II areas were identified for that portion of the proposed lease area on the Fishlake National Forest.

The 164.37 acres of BLM administered lands on the proposed lease area lie within an uninventoried roadless area. Under guidelines of the Federal Land Policy and Management Act of 1976, all such public lands must be reviewed for potential wilderness values. This review will not officially begin until the review procedures are issued in fall, 1978 (Figure 16).

BLM administered lands on the proposed lease area consist mainly of the east and south facing escarpments and some bottom land which lies below the coal seams. Much of the coal along the outcrop in this area has been burned. In an adjacent area, the coal burned into the seam some 750 feet.

2. Impacts of Coastal States Proposal

Possible wilderness values in the RARE II area on the Manti-LaSal National Forest would not be affected as no surface disturbance would be anticipated. Underground mining of some 50 acres would occur but would be limited by topography and areas of burned coal. Only phase 1 mining would occur; therefore, no subsidence would be anticipated.

Possible roadless and wilderness values of the BLM administered lands on the proposed lease area likewise would not be affected by lease issuance. Phase 1 mining would occur on some 60 acres but no subsidence would be expected. No surface activities would occur.

3. Impacts of Alternate Ownership

If an entity other than Coastal States Coal Company obtains the lease, possible development on the RARE II area would be necessary.

Should surface facilities be constructed in Quitcupah Canyon, loss of possible wilderness values in the RARE II area would occur. Surface disturbances such as access or haulage roads and mining facilities are inherently incompatible with wilderness values.

Some underground mining (60 acres) would occur but would be limited by topographic features and areas of burned coal.

Possible roadless and wilderness values of the BLM administered lands on the proposed lease area would be lost if surface disturbances were allowed. Underground mining would occur on some 60 acres and would also be limited by areas of burned coal.

CHAPTER IV

POSSIBLE MITIGATING OR ENHANCING MEASURES

A. Geology and Topography

1. Coastal States Proposal and Alternate Ownership

No mitigating measures have been developed for Coastal States' proposal.

In case of alternate ownership, the lessee would be required to monitor the area for subsidence.

B. Mineral Resources

1. Coastal States Proposal and Alternate Ownership

Coordination between oil and gas companies and the lessee would be necessary if petroleum exploration on the proposed lease area were to resume.

C. Hydrology

1. Coastal States Proposal

Hydrological monitoring stations would remain in operation so that effects of subsidence or mine discharge could be evaluated on a continuing basis.

If the two springs from which water has been appropriated or which are significant to the human environment are affected by mining, Coastal States would replace the water or make restitution, as required by the State of Utah (Title 73323), 30 CFR 211, or the Office of Surface Mining Reclamation and Enforcement, whichever is applicable.

2. Alternate Ownership

The lessee would be required to establish an appropriate hydrological monitoring system to measure possible effects of mining on water sources in the area. As stated above, if any of these sources are affected proper restitution would be required according to State and Federal laws.

Mine water would not be discharged unless it meets the quality standards required by the State of Utah (Title 73141, et al.) or EPA, whichever is applicable.

D. Soils

1. Coastal States Proposal

All suitable topsoil on disturbed areas, i.e., drill pads and new road areas would be properly stockpiled for reuse when operations in the area are completed.

All disturbed areas would be restored to the original contours using stockpiled topsoil. The sites would then be revegetated with a plant species mixture specified by the appropriate surface management agency. Timing and method of revegetation would also be determined by the surface management agency.

2. Alternate Ownership

All measures described above would apply. In addition, any improved roads would be established along natural contours to abate erosion. Roads would be appropriately water barred as specified by the appropriate surface management agency.

E. Climate, Air Quality, Noise

1. Coastal States Proposal and Alternate Ownership

During the summer months, major haulage roads, not paved, would be kept watered to minimize dust.

F. Fire

1. Coastal States Proposal and Alternate Ownership

During exploration activities, proper fire fighting equipment such as shovels, and pulaskis, would be available at all times. Waste material would be disposed of in accordance with applicable State and Federal regulations.

G. Fish and Wildlife

1. Coastal States Proposal

No mitigating measures have been developed.

2. Alternate Ownership

No drilling activities would be allowed from November through June to avoid interference with wintering and calving elk. All disturbed areas would be rehabilitated to restore native habitat conditions per specifications of the appropriate surface management agency.

H. Vegetation

1. Coastal States Proposal and Alternate Ownership

All disturbed areas would be revegetated with species specified by the appropriate surface management agency. All stockpiled topsoil should be replaced on disturbed areas prior to reseeding.

The applicant would provide a botanist who is qualified to survey for threatened and endangered flora and approved by the appropriate Federal official. The botanist would intensively survey all areas to be disturbed and designate those areas in which no disturbance would be permitted. The botanist would be available, as needed, during surface disturbance activities.

I. Socioeconomics

1. Coastal States Proposal and Alternate Ownership

No mitigating measures have been developed.

J. History, Archaeology, and Paleontology

1. Coastal States Proposal and Alternate Ownership

The applicant would provide a qualified archaeologist who would be subject to approval by the appropriate Federal official. The archaeologist would intensively survey the area prior to any surface disturbance. An approved archaeologist would be available, as needed, during surface disturbance. If the archaeologist determines that cultural values would be disturbed, construction would not proceed until appropriate action could be taken.

The applicant would provide a qualified paleontologist who would be subject to approval by the appropriate Federal official. The paleontologist would conduct an intensive survey of all areas to be disturbed. An approved paleontologist would be available, as needed, during surface disturbance. If the paleontologist determines that paleontological values would be disturbed, construction would be halted until appropriate action could be taken.

K. Public Health and Safety

1. Coastal States Proposal

No mitigating measures have been developed.

2. Alternate Ownership

The applicant would comply with all Federal, State, and local regulations pertaining to air and water quality control. As mining progresses below the water table, it is anticipated that it would be necessary to pump ground water out of the mine and discharge it to the surface. If such discharge is necessary, the operator would apply for a permit, and would monitor the discharge as required by the permit. Sanitary water disposal would conform to state codes.

When mining activities are completed, mining machinery would be removed and the portals sealed according to State and Federal regulations. Buildings not utilized would be removed.

L. Timber Management

1. Coastal States Proposal and Alternate Ownership

Sites of surface disturbance such as access roads or drill pads would be located so as to avoid any timber species.

M. Range Management

1. Coastal States Proposal and Alternate Ownership

Mitigating measure are discussed under M. Hydrology.

N. Recreation - Aesthetics

1. Coastal States Proposal

The visual impact of the air intake portals would be effectively reduced by painting the screens and support structures a nonreflective earthen color similar to the surrounding landscape.

2. Alternate Ownership

Disturbances of surface lands would be limited to areas required for construction of building, structures, mine portal opening, and waste disposal.

Restoration work on the lease area would include sealing of the mine openings with permanent, noncombustible seals approved by MESA and USGS. Mine openings would be sealed and covered with earth and rock to the original contours or as near to that as practical. Excavations at the mine openings would be covered with earth and rock to the natural angle of repose. The fills would be revegetated as recommended by the appropriate land management agency.

O. Transportation

1. Coastal States Proposal and Alternate Ownership

No mitigating measures have been developed.

P. Research, Administration, and Special Uses

1. Coastal States Proposal and Alternate Ownership

No mitigating measures have been developed.

Q. Wilderness and Roadless Areas

1. Coastal States Proposal and Alternate Ownership

No surface activities would be allowed which would reduce or eliminate potential wilderness values in the RARE II area on the Manti-LaSal National Forest or the uninventoried roadless area on BLM administered lands until after proper inventories have been completed and a determination on wilderness character made.

CHAPTER V

ADVERSE IMPACTS WHICH CANNOT BE AVOIDED SHOULD THE PROPOSAL BE IMPLEMENTED OR AN ALTERNATE OWNERSHIP OCCUR

A. Geology and Topography

1. Coastal States Proposal

Subsidence would occur on approximately 922 acres (35 percent of the proposed lease area). Subsidence (up to 9 feet) has occurred over Coastal States' existing mine workings. However, the only obvious surface manifestations are surface fractures in the vicinity of East Spring Canyon. Individual displacements along these fractures are usually less than 1 foot vertically and in width.

Surface deformation on the proposed lease area would probably be expressed as broad depressions with associated fractures above the areas of subsidence activities. Maximum depths of these depressions would be 8 to 10 feet. Formation of tension cracks would appear a few months after mining. Compression bulges and anticlines would appear about 1½ to 2 years after completion of mining. Additional formation of tension cracks as the surface subsides to a final profile would occur several years after completion of mining.

2. Alternate Ownership

The environmental impacts of alternate ownership would be similar to those described above. Effects on topography would be dependent upon location of facilities and mining methods used. Subsidence would occur on various portions of the proposed lease area in relation to mining methods used and the amount of coal removed.

B. Mineral Resources

1. Coastal States Proposal

a. Coal - Approximately 14 million tons could be mined during the life of the lease at 66 percent recovery rate. The remaining coal would be permanently lost.

b. Oil and Gas - The sedimentary units that have produced oil and gas in the Wasatch Plateau lie more than 3,000 feet below the coal of the Upper Hiawatha bed. Although there would be no conflict between the two resources, future wildcat wells that may be drilled on the lease area may require special methods of drilling and coordination with Coastal States to avoid mining operations.

c. Other Mineral Resources - No adverse impacts are anticipated.

2. Alternate Ownership

a. Coal - Recovery rate of coal reserves on the proposed lease tract would be dependent upon the mining plan and mining techniques. Coal not mined would be lost. Normal underground recovery rates range from 45 to 60 percent of in-place reserves. This lower recovery rate would result from the necessity to leave barrier pillars between Coastal States' operation and the new mine.

b. Oil and Gas Environmental impacts associated with alternate ownership would be similar to those analyzed for the Coastal States proposal.

c. Other Mineral Resources No adverse impacts are anticipated.

C. Hydrology

1. Coastal States Proposal

Subsidence after mining could break a 20-foot thick bentonitic shale aquiclude above the coal seam providing additional avenues for hydraulic connection of water bearing zones. Water zones in the area are fresh; however, the creation of additional avenues for water movement increases the potential for raising the dissolved solids concentrations in the water, reducing water quality.

The flow of two local upland springs may be lost or reduced. This would result in loss of water sources to livestock and wildlife in the area. Vegetation types surrounding these springs and seeps would also change. If water flow is reduced or halted, it is doubtful that former levels of flow would ever be attained.

2. Alternate Ownership

Environmental effects on surface and subsurface hydrology would be similar to those associated with the Coastal States proposal. The additional surface disturbance associated with developing new mine facilities, haulage roads, etc. (approximately 75 - 100 acres) would increase potential for runoff. Intensity and significance would depend on the location of the disturbances.

D. Soils

1. Coastal States Proposal

As a result of Coastal States' exploration programs which would be conducted during the first field season after the lease is issued,