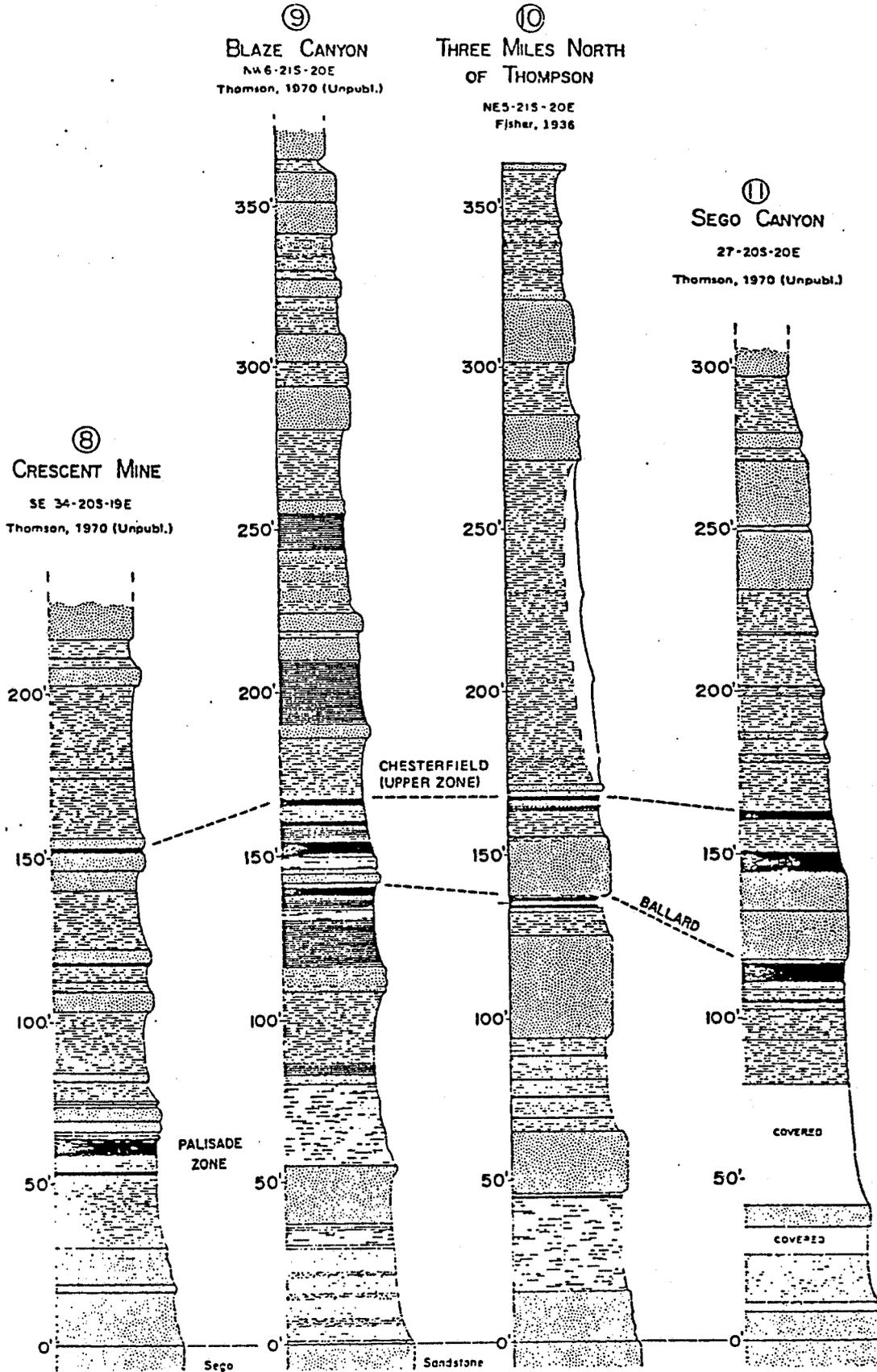


SPOT BOLTING SAFETY PRECAUTIONS TO BE TAKEN

1. Spot roof bolting shall be used only as a supplement to the approved roof control plan.
2. Roof bolts (spot bolting) shall be installed in accordance with roof conditions, but in no case shall spacing exceed 4 feet lengthwise and crosswise.
3. Where spot bolts are installed, roof bolting shall begin under safe roof and continue for the length of the adverse roof condition until safe roof is again encountered.
4. All components of the roof bolt assembly shall comply with the American National Standards Institute "Specifications for Roof Bolting Material in Coal Mines".
5. When wooden material such as planks, header blocks, or crossbars are used between the bearing plate and the roof for additional bearing, the use shall be limited to short-life openings (not to exceed 3 years) unless treated. Bearing plates used in conjunction with wooden materials shall be not less than 4 inches square or of equivalent area.
6. Finishing bits shall be easily identifiable by sight or feel and the diameter shall be within a tolerance of plus 0.030 inch minus zero of the manufacturer's recommended hole diameter for the anchor used.
7. An approved calibrated torque wrench that will indicate the actual torque on the roof bolts by a direct reading shall be provided on each roof bolting machine or in the place where bolts are being installed.
8. Immediately after each area has been spot bolted at least one roof bolt out of every four shall be tested by a qualified person. If at least one-half of the bolts tested do not fall within the indicated torque range, the remaining bolts shall be tested. If the majority of the bolts tested still fall outside the indicated range, necessary adjustments in the equipment used for tightening the bolts shall be made immediately. If, after these adjustments are made, the indicated torque are still not obtained, supplementary supports such as additional roof bolts, longer roof bolts with adequate anchorage, posts, cribs, or crossbars shall be installed.
9. When roof bolts (spot bolting) are installed in by the outby corner of the last open crosscut, spot-check on torques shall be made on a daily basis on at least one roof bolt out of every 10 from the outby corner of the last open crosscut to the face. The results of these tests shall be recorded in the onshift examination book. The record shall show the number of bolts tested and the number above and below the indicated range. If the results show that the majority of the bolts are not maintaining at least 125 foot-pounds of torque or have loaded up to where they exceed 300 foot-pounds of torque, supplementary support such as additional roof bolts, longer roof bolts with adequate anchorage, posts, cribs, or crossbars shall be installed.

10. At least two temporary supports on not more than 5-foot centers shall be installed before roof bolts are installed at spot locations.
11. The following items are to be incorporated into the plan, either on a sketch or in the sheet listing the materials to be used:
 - a. Bearing plates used directly against the mine roof shall be not less than 6 inches square or of equivalent area. In exceptional cases where the mine roof is firm and not susceptible to sloughing, bearing plates 5 inches square or of equivalent area may be used.
 - b. Roof bolts shall be installed as close as possible to, but not more, than 5 feet from the rib before a sidecut is started.
 - c. Roof bolts shall be installed as close as possible to, but not more, than 5 feet from the face before starting conventional cutting or a continuous miner run, except where the bolter is an integral part of the mining machine.
 - d. Devices shall be used to compensate for the angle when roof bolts are installed at angles greater than 5° from the perpendicular to the roof line.

All intentional roof falls defined in Title 30, CFR Part 80, shall be investigated and the results of the investigation recorded in a book provided for that purpose. Such falls shall also be shown on a map of the mine.



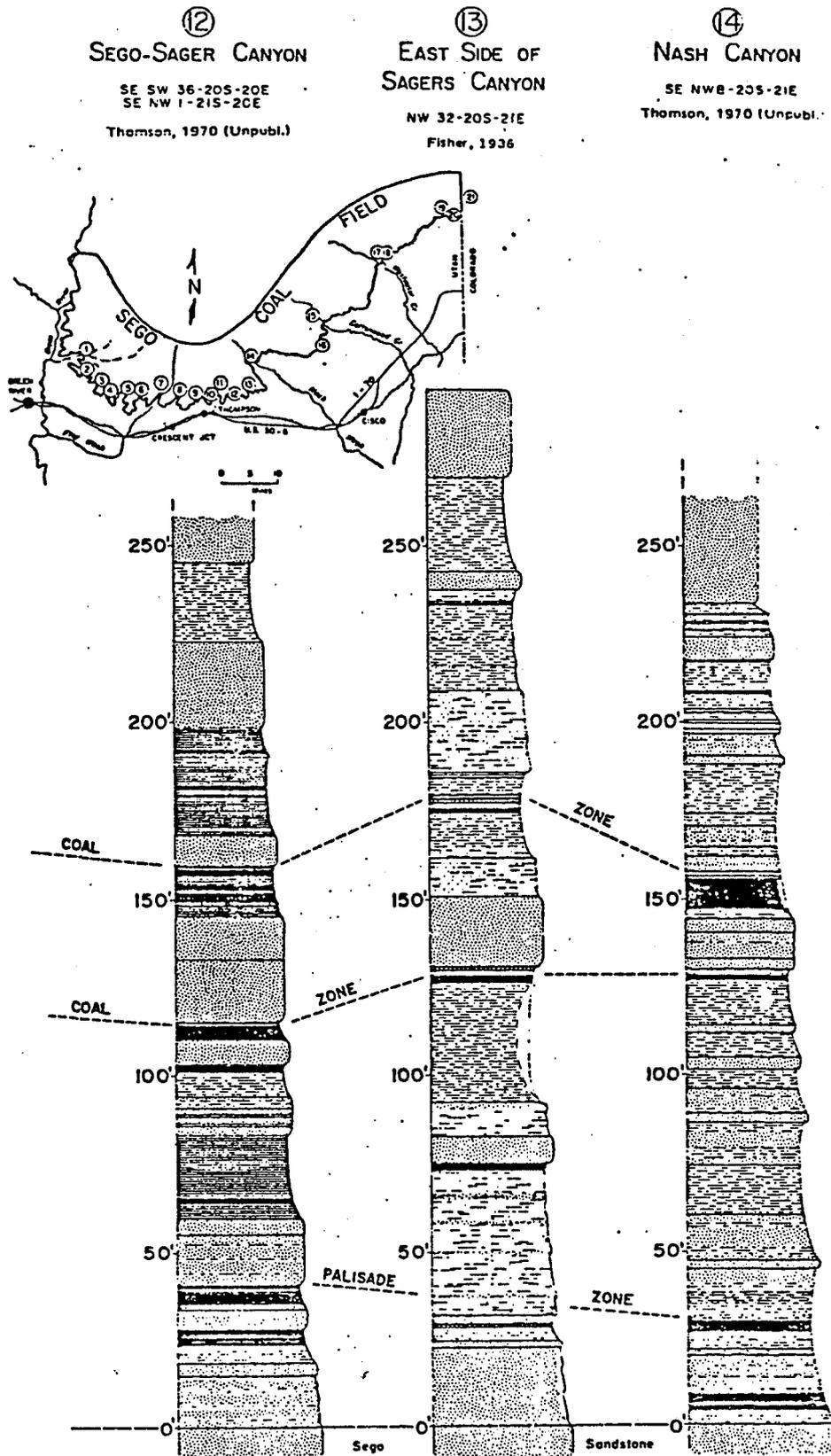
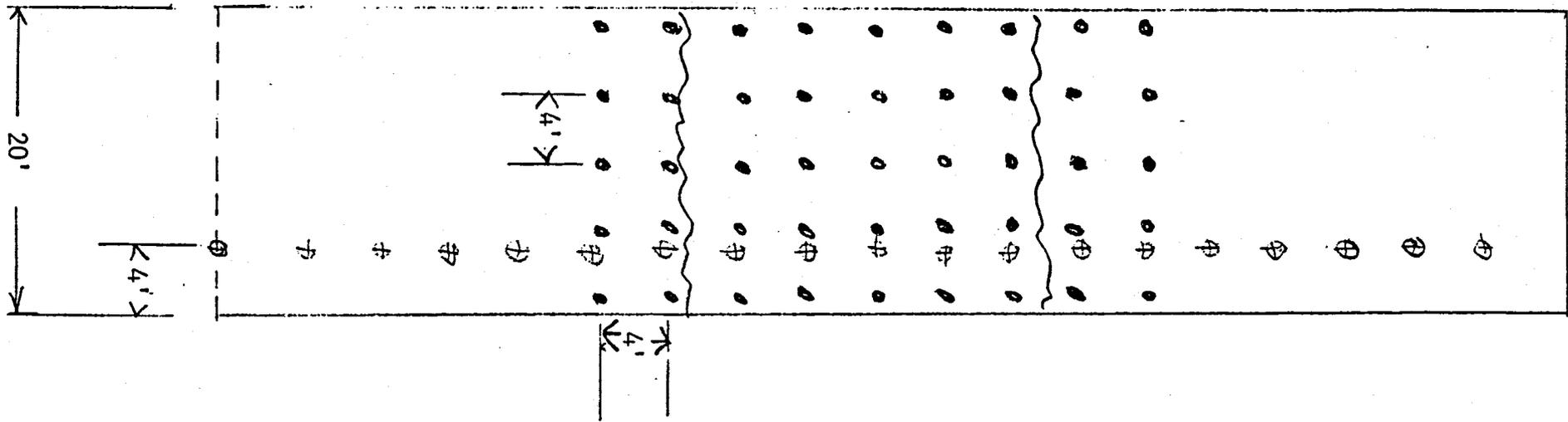


Figure 6. (continued)



Attachment "B" conventional roof control plan supplemented by spot bolt plan under adverse roof conditions.

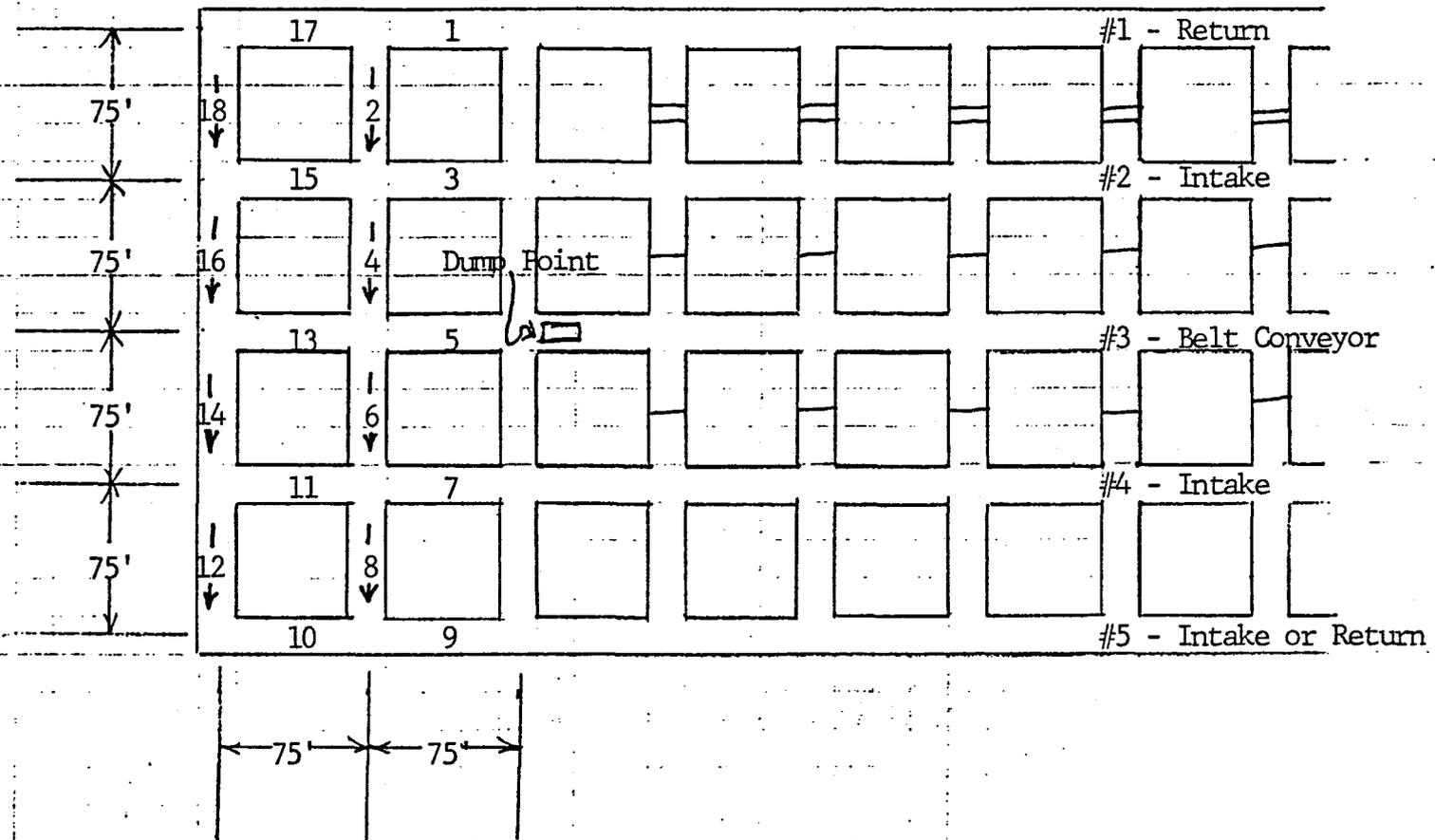
Spot Roof Bolt Plan (20' foot wide entry).

At least two temporary supports on 5' centers shall be installed before roof-bolts are installed at spot locations.

- Roof Bolt
- ⊕ Post with cap piece

REF. EMS-H&S-3-1-6
Scale: 1" = 10'

← Direction of Advance



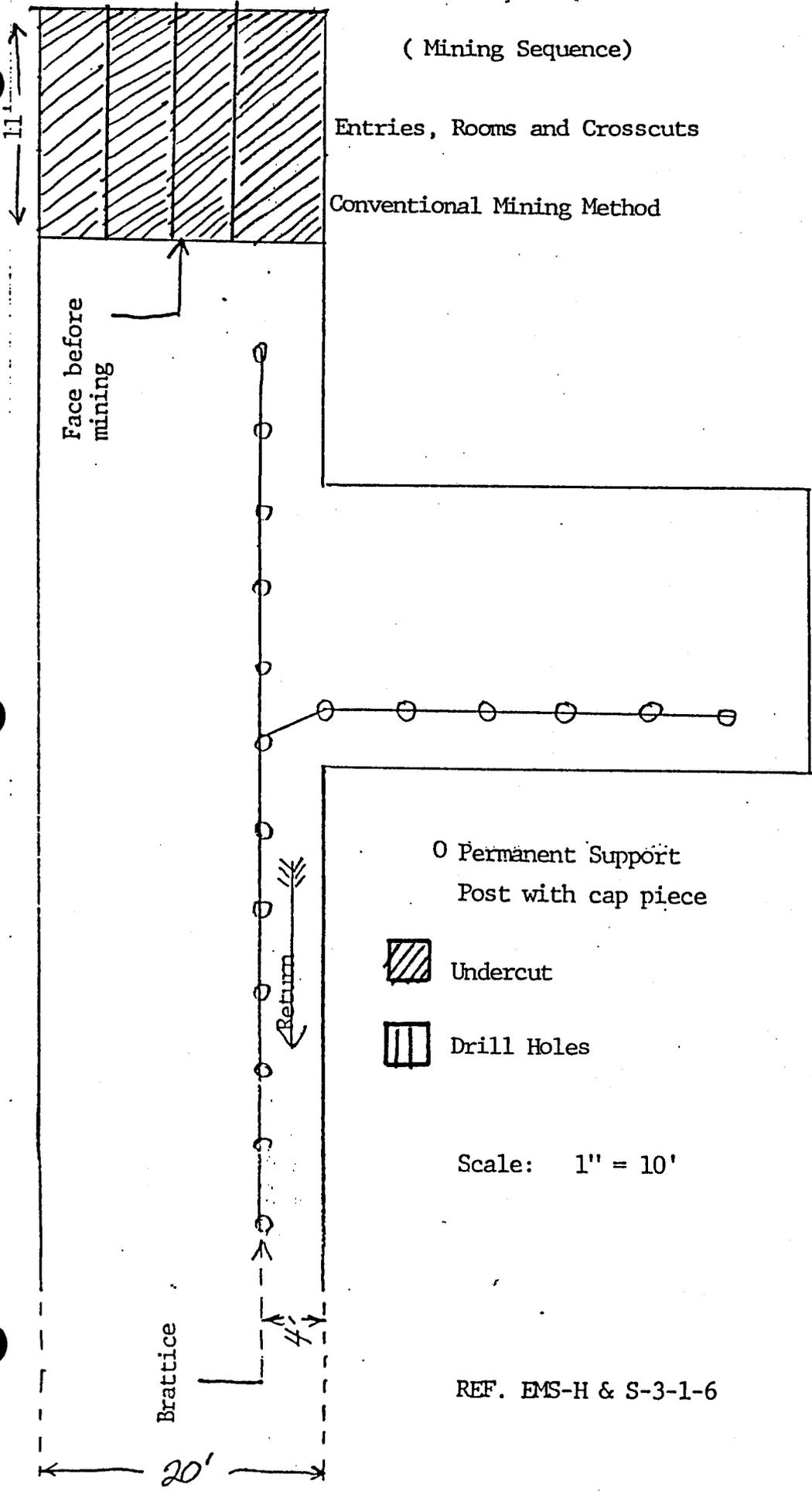
Typical Mining Sequence 1 thru 18
Coal Height 48" Average
Entry and Crosscut Width: 19 - 20'
Centerline Distances: As shown

New-Tech Mining Corporation
Moab, Utah
Entry Development Sequence
BlackJack #1 Mine

(Mining Sequence)

Entries, Rooms and Crosscuts

Conventional Mining Method



○ Permanent Support
Post with cap piece

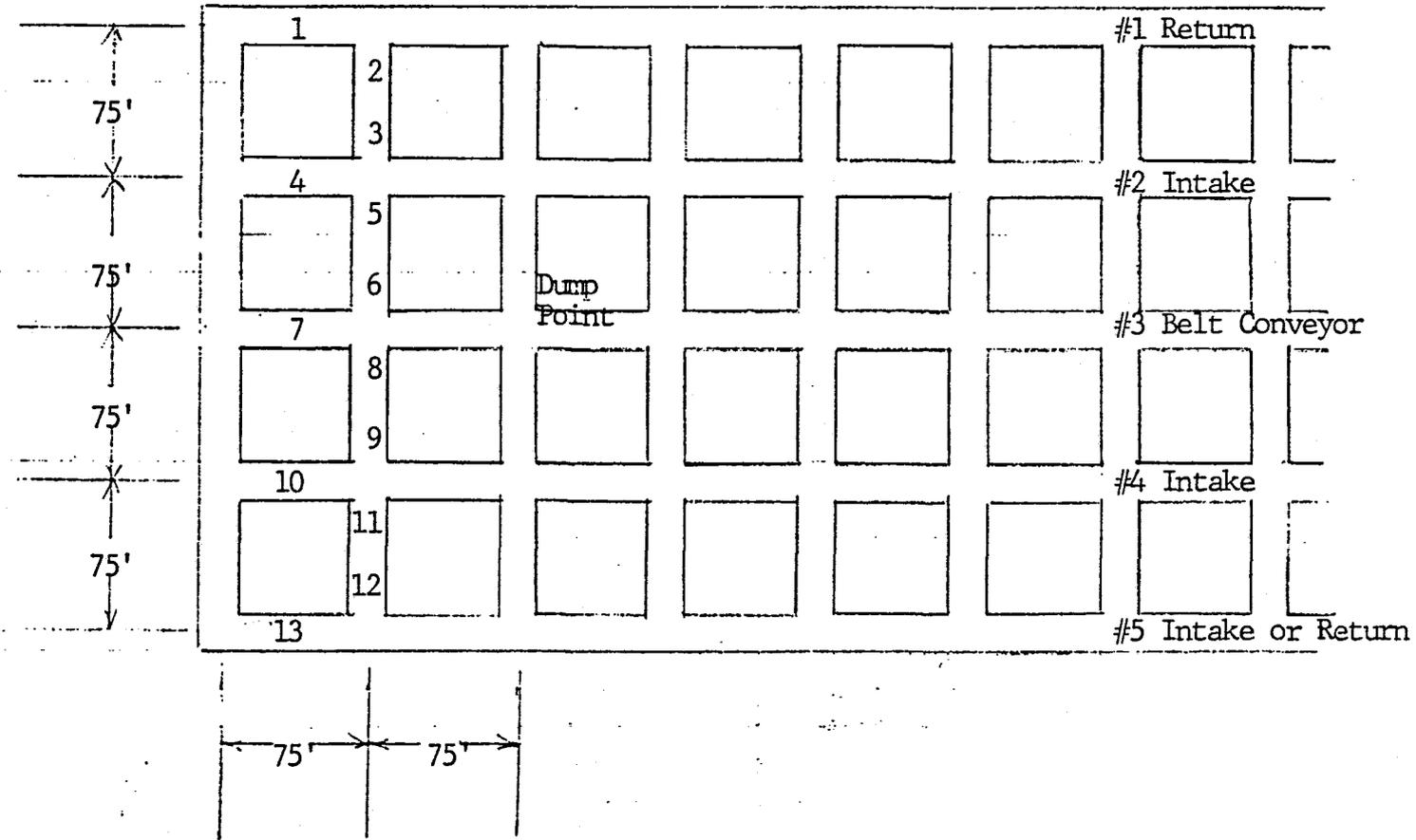
▨ Undercut

▧ Drill Holes

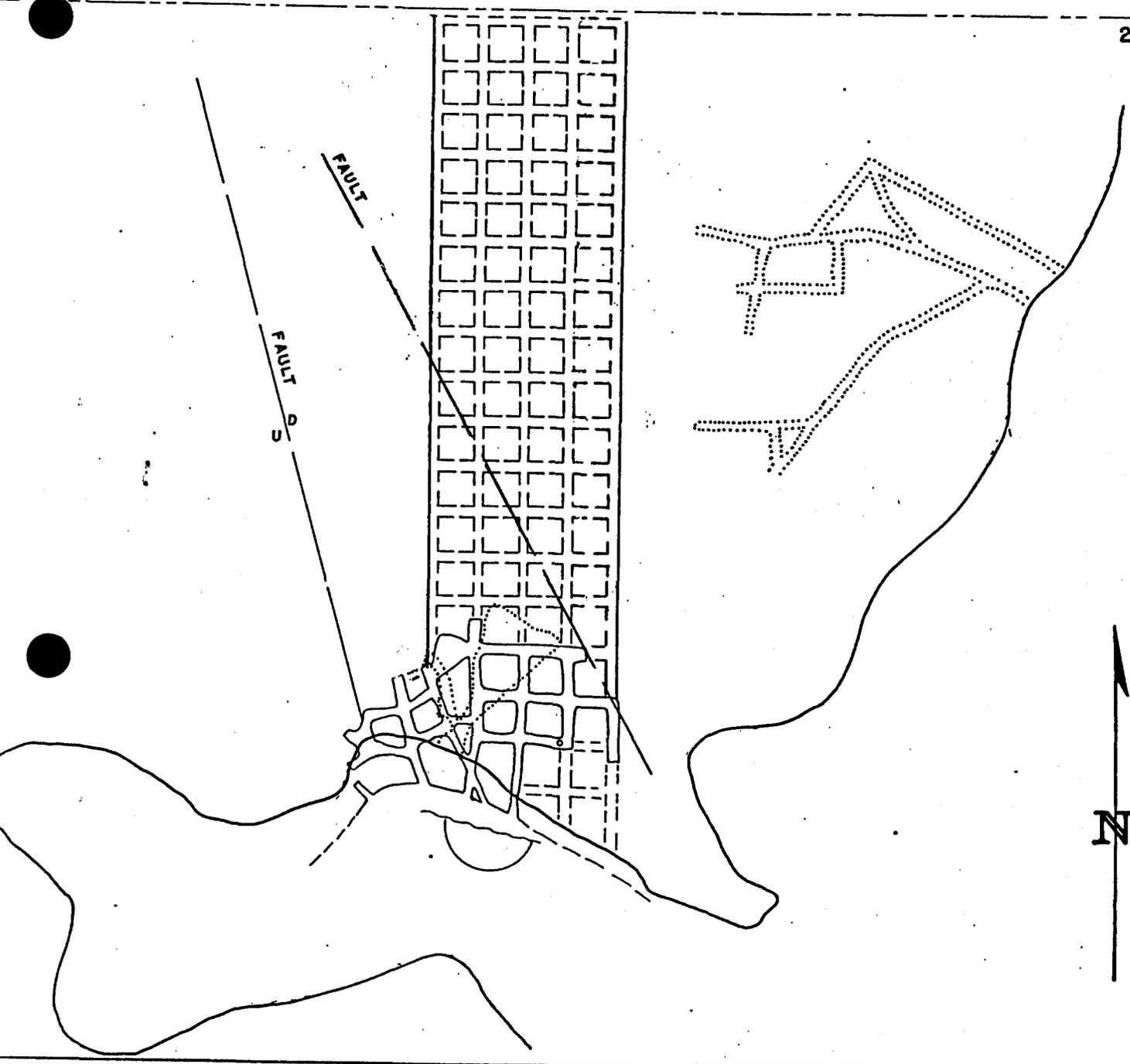
Scale: 1" = 10'

REF. EMS-H & S-3-1-6

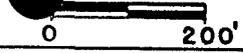
← Direction of Advance



Typical Mining Sequence Conventional 1 -thru- 13
Coal Height 48" Average
Entry and Crosscut Width 19-20 Ft.
Center Line Distances as shown



-  FAULT
-  OUTCROP "C" COAL SEAM
-  OLD "C" SEAM MINE WORKINGS
-  PIPE FROM SURFACE
-  PRESENT MINE WORKINGS
-  PROPOSED MINE PLAN

SCALE 1:1200

 0 200'

H.W.MERRELL 3/83

NEW-TECH MINING
 THOMPSON CANYON COAL MINE
 EXPLORATION & MINING PLAN
 FOR
BALLARD COAL SEAM (B)

Thompson Water Improvement District

Thompson, Utah 84540

June 13, 1983

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FEB 07 1986

DIVISION OF
OIL, GAS & MINING

New-Tech Mining Corp.
960 South Main
Hoab, Utah 84532

Attention: Lloyd R. "Tex" Edmisten
Mine Superintendent

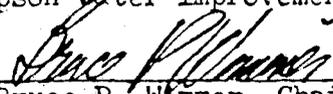
Dear Mr. Edmisten:

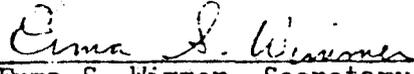
This is to advise your company that Thompson Water Improvement District is in a position to furnish water for your proposed coal mining operation in Thompson Canyon.

The meetings of the Board of Trustees are held on the first Tuesday of the month; however, a special meeting may be called for your convenience, if you will so advise.

Trusting an agreement may be reached to our mutual benefit,

Very truly yours,
Thompson Water Improvement District,
By:


Bruce P. Wimmer, Chairman


Erma S. Wimmer, Secretary

Dead Horse Point



Moab-West Rim



Double Arch



Fisher Towers



County Commissioners:

Jimmie Walker
Chairman

William H. Hance

John L. Zimmerman

Barbara Domenick
Clerk and Auditor

Grand County

STATE OF UTAH
Moab, Utah 84532

Lilly Mae Noorlander
Recorder
Donna C. Loveridge
Treasurer
Norma S. Stocks
Assessor
Jim Nyland
Sheriff
William L. Bengel
Attorney
John Keogh
Surveyor

August 27, 1985

New Tech Mining Corp.
211 West Park Dr.
Moab, Utah 84532

Dear Sirs:

Grand County Commissioners, at their meeting of August 26, 1985,
authorized you to install a concrete sump on the county right-of-
way in Thompson Canyon.

Sincerely,

Jimmie Walker, Chairman
Grand County Commission

THOMPSON MOTEL
Thompson, Utah
84540

September 28, 1985

To Whom It May Concern;

New Tech Mining Corporation of Moab, Utah has made arrangements with us to move a shower type trailer into our trailer park located in Thompson, Utah for the use as a shower facility for the coal mine employees working at the Black Jack #1 Mine.

The septic tank system in the trailer park was designed and built greatly oversized and will accomodate the shower facility with no problem.

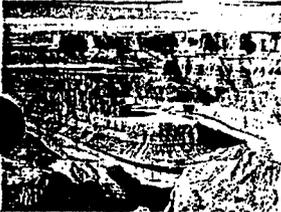
Yours truly,



Sadie Dutos

THOMPSON MOTEL

Dead Horse Point



Moab-West Rim



Double Arch



Fisher Towers



County Commissioners:

Jimmie Walker
Chairman

William H. Hance

John L. Zimmerman

Barbara Domenick
Clerk and Auditor

Grand County

STATE OF UTAH
Moab, Utah 84532

September 30, 1985

Lilly Mae Noorlander
Recorder
Donna C. Loveridge
Treasurer
Norma S. Stocks
Assessor
Jim Nyland
Sheriff
William L. Benge
Attorney
John Keogh
Surveyor

Bernard LeFevre, Mgr.
New Tech Mining Corp.
211 West Park Dr.
Moab, Utah 84532

Dear Mr. LeFevre:

We hereby grant permission for New Tech Mining Corporation to use the Grand County Sanitary Land Fill facilities located in Moab, Utah to dispose of the garbage waste & debris from the Black Jack #1 Coal mine located in Thompson Canyon, Utah.

Sincerely,

Jimmie Walker, Chairman
Grand County Commission

William H. Hance, Commissioner

JBCO CONSTRUCTION

P. O. Box 1030
MOAB, UTAH 84532

PHONE 259-5316

BILL HANCE
Manager

SCHEDULE OF EQUIPMENT & LABOR RATES

ITEM NO.	DESCRIPTION	RATE PER HOUR
1.	Supervisor	\$25.00
2.	Engineer	25.00
3.	Crew Foreman	13.50
4.	Equipment Operator	13.50
5.	Laborer	12.50
6.	Welder - Certified	34.50
7.	Welder's Helper	13.50
8.	Mechanic's Helper	16.00
9.	Pumper	16.00
10.	Powder Man	24.00
11.	Pickup W/Tools, Less Driver	13.00
12.	Pickup (Hotshot) Per Mile	.50
13.	Three Ton Winch Truck, Less Driver	19.00
14.	Dump Truck W/Driver	35.00
15.	Tandem Truck W/Driver, (Min. 50.00)	60.00
16.	Tandem Truck W/Winch, W/Driver	60.00
17.	Int'l Truck W/Winch, W/Driver	45.00
18.	Single Axle Float	8.00
19.	Small Float	6.00
20.	140 Cleveland Trencher	.50 Ft.
21.	320 Cleveland Trencher	1.00 Ft.
22.	Backhoe Less Operator	23.00
23.	Road Grader W/Operator	55.00
24.	D-8H W/Ripper, W/Operator	90.00

JBCO CONSTRUCTION

P. O. Box 1030
MOAB, UTAH 84532

BILL HANCE
Manager

PHONE 259-5316

ITEM NO.	DESCRIPTION	RATE PER HOUR
25.	D-7F W/Ripper, W/Operator	\$70.00
26.	D-6C W/Ripper, W/Operator	60.00
27.	T.D. 18A Side Boom W/Operator	65.00
28.	T.D. 20A Side Boom W/Operator	75.00
29.	D-6E Side Boom W/Operator	50.00
30.	D-4E Side Boom W/Operator	40.00
31.	Fork Lift (8000 Lb.) W/Operator	45.00
32.	185 Air Compressor W/Tools, Less Oper.	18.00
33.	125 Air Compressor W/Tools, Less Oper.	15.00
34.	50 KW Generator	100.00 Per Day
35.	35 KW Generator	70.00 Per Day
36.	Sand Blaster, Less Sand	9.00
37.	Cutting Torch, Hoses, Gauges & Gas	9.00
38.	Paint Gun (8 Hr. Minimum)	5.00
39.	Chain Saw (8 Hr. Minimum)	8.50
40.	6" Cutters and Dies (8 Hr. Minimum)	6.00
41.	Grass Seeder (8 Hr. Minimum)	12.00
42.	Small Pump (8 Hr. Minimum)	9.00
43.	Trailer House	16.00 Per Day
44.	400 Bbl. Tank (First Five Days)	230.00
	Every Day After	20.00
45.	Separator (First Five Days)	450.00
	Every Day After	75.00
46.	Trash Basket	5.00 Per Day

JBCO CONSTRUCTION

P. O. Box 1030
MOAB, UTAH 84532

BILL HANCE
Manager

PHONE 259-5316

NOTES: APPLICABLE TO ALL WORK

- A. Subsistence - \$50.00 per man when required to be away from home over night.
- B. Travel time to be charged both ways for crew members. Travel time to be charged both ways for vehicles and crew foreman, the driver of vehicle.
- C. Time and one-half to be charged on Sunday and holidays: New Year's Day, Easter, Memorial Day, Independence Day, Labor Day, Thanksgiving Day and Christmas Day.
- D. Materials and Services of Sub-Contractors will be furnished by the contractor only as requested by the customer. Prices charged in such instances will be at contractor's net cost plus a handling charge of 20%. Copies of the Sub-contractors and Suppliers Invoices will be attached to the Contractor's Invoice.
- E. The above rates apply to routine roustabouting and construction work in the oilfield.
- F. Major pipeline construction and major plant work will require separate negotiation.

TABLE 3-3 - Revised 12-85

BLACK JACK NO. 1 MINE RECLAMATION SCHEDULE

FIRST YEAR RECLAMATION	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.
REMOVE SURFACE FACILITIES	▨											
INSTALL PORTAL SEALS		▨▨▨										
GRADE ROADS & PADS, PREPARE, NEUTRALIZE TOXIC AREAS			▨									
REMOVE CULVERTS & RIPRAPPING OF CHANNEL ✓			▨									
REVEGETATION SOIL PREPARATION RESEED, FERTILIZE & MULCH							▨▨▨					
SECOND YEAR RECLAMATION												
REVEGETATION MONITORING	▨		▨		▨		▨	FIRST YEAR MONITORING				
				▨	▨		▨	3RD, 5TH, 7TH, & 10TH YEAR MONITORING				
CONTINGENT RESEEDING AND REPLANTING	▨		▨				▨					

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DIVISION OF
OIL, GAS & MINING

CHAPTER IV

LAND STATUS, LAND-USE AND
POST-MINING LAND USE

UMC 783.22, UMC 784.15
UMC 817.133

Prepared For
NEW TECH MINING CORPORATION
MOAB, UTAH

Revised
September 3, 1985

By
EMPIRE ENGINEERING & LAND SURVEYING
86 North 200 East
Price, Utah
84501

CHAPTER IV

LAND STATUS, LAND USE
UMC 783.22, UMC 784.15, UMC 817.133

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CHAPTER IV

LAND STATUS AND LAND-USE UMC 783.22, 784.15, 817.133

UMC 783.22 LAND USE INFORMATION

The land use for the permit area has been used for only two purposes historically, these uses are: (1) the grazing of the surface land and (2) the mining of the coal seams, underground coal operations with the limited use of the surface ground for the access and operations of the mines.

1. SOCIOECONOMIC CONSIDERATIONS

The draft of the Environmental Impact Statement for Grand Resource Area Management Plan of the BLM in March, 1983 included recent figures on the economic factors affecting Grand County.

Of the 8400 population of the county, 95% live in Moab - Spanish Valley. The figure given for jobs directly attributable to mining was 22%. Using the multiplier effect of purchasing and related business, the total effect of the mining industry is from 35 to 45% of the local employment.

Recent unemployment in the uranium industry, including closing of mines and stopping exploratory drilling, has raised the unemployment figure in Grand County to 23% during the first quarter of 1985.

Any new mining or other industry to start up in Grand County would give the area a tremendous economic boost that is badly needed at this time.

If job applications received by New Tech Mining without any solicitation are of any indication, the people of Grand County are certainly looking for jobs. Opening of the Black Jack #1 Mine in Thompson Canyon would be one way to help get the economy of the region going in a positive direction.

UMC 783.22(a) LAND STATUS

METHODOLOGY

A search was made in the courthouse records for ownership as well as the county's planning and zoning regulations. Consultation with the BLM who manage the federal lands that are adjacent to the 160 acres was made as to the future land use of the area.

1. SURFACE LAND STATUS - MINE PLAN AREA

The surface rights of the mine permit area is owned by Patsantaras Land and Livestock Company, 3112 4 1/2 Road, Grand Junction, Colorado 81501. The surface land is presently being used by Patsantaras Land and Livestock Company to graze sheep in the early summer. The only owners of contiguous surface acreage besides Patsantaras Land and Livestock Company is the U.S. Government whose land is managed by the BLM. Surface land ownership in the vicinity of New Tech Mining property is shown in Figure 4-2.

2. MINERAL OWNERSHIP - MINE PLAN AREA

The mineral rights including coal, all other minerals including oil and gas are owned by New Tech Mining Corporation, 59 1/2 South Main, Moab, Utah 84532. There are no oil, gas or other mineral leases outstanding on the 160 acres owned by New Tech Mining Corporation. There are no oil wells or gas wells on the property. The contiguous coal is owned by U.S. Government and managed by the BLM. Figure 4-1 shows coal ownership in the vicinity of New Tech Mining property.

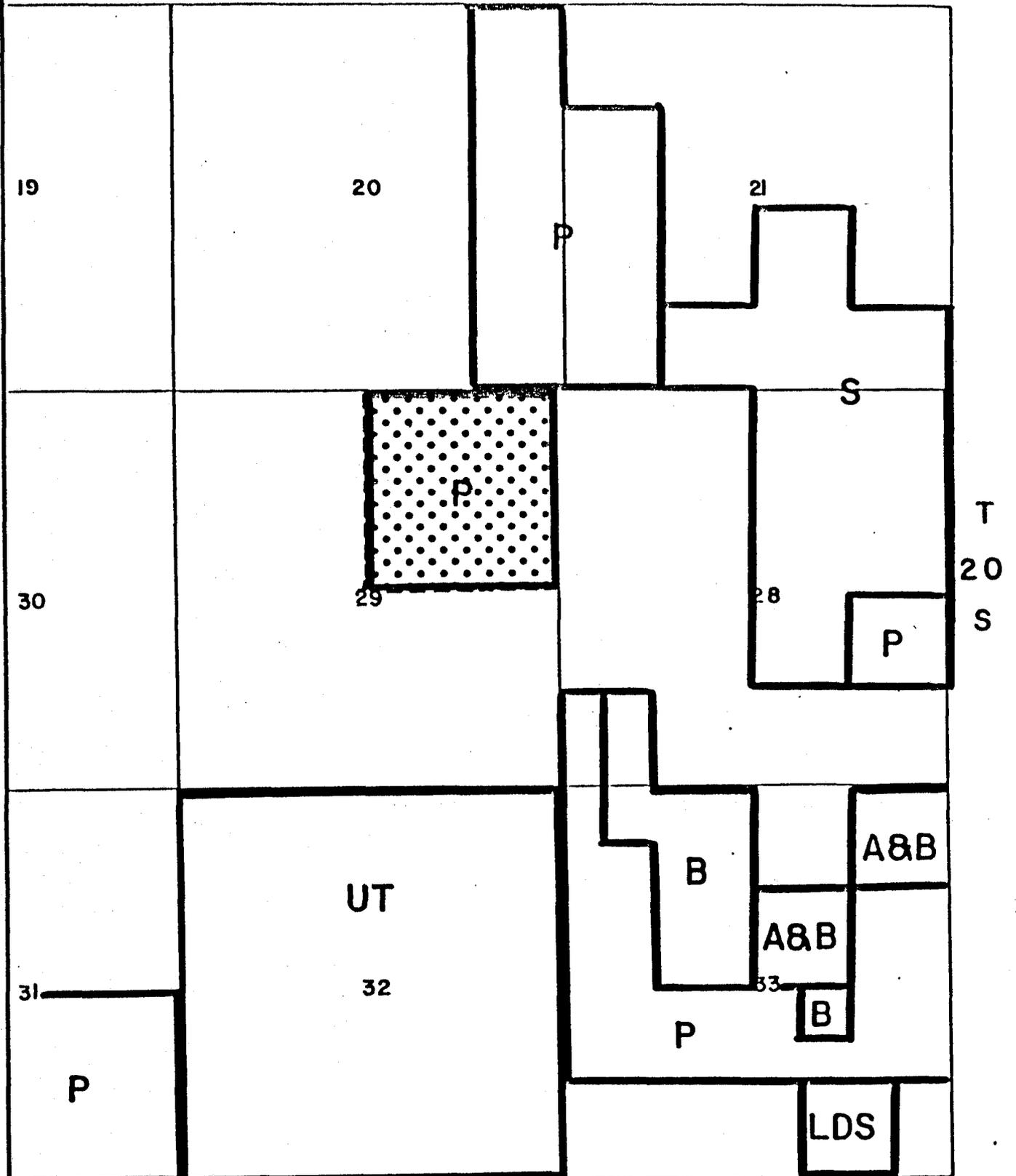
UMC 783.22(a)(1) Land-Uses at Time of Filing

The present land disturbances on the property was done more than five years ago. The old Clark Mine (Reed Lance Mine) mined coal from the Chesterfield coal seam from 1946 to 1954, with the coal mainly used for local consumption. Later the "B" Seam or Ballard Seam was opened up near the center of the 160 acres by West Pack Mines in 1978. There was a limited amount of coal produced before this company stopped production.

UMC 783.22(a)(2) Land-Use Description (UMC 783.22(c))

Grand County has a Land Use Planning Ordinance #134 which includes the "G-1" designation which is the grazing zone. The zone includes any grazing or any mining activity. Thompson Canyon is zoned "G-1" by Grand County.

R 20 E



- P = PATSANTARAS LAND & LIVWSTOCK
- B = J. GOLDEN BAIR
- S = R&J, H.F. & A. SEABURG
- A&B = ARNOLD & BARBOGLIO
- LDS = LDS CHURCH
- UT = STATE OF UTAH
- = USA

H.W.MERRELL 5/83

NEW TECH MINING
BLACK JACK PROPERTY
 GRAND COUNTY, UTAH
SURFACE OWNERSHIP
FIGURE 4-2

R 20 E

19

20

21

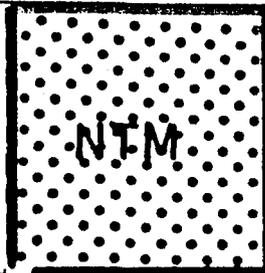
S

T
20
S

30

29

28



UT

B

A&B

A&B

P

31

32

33

B

P

LDS

NTM = NEW TECH MINING
 S = SFABURG, R&J, H, F. & A
 B = BAIR, J, GOLDEN
 A&B = ARNOLD & BARBOGLIO
 P = PATSANTARAS LAND & LIVESTOCK
 LDS = LDS CHURCH
 UT = STATE OF UTAH
 = USA H.W.MERRELL 5/83

NEW TECH MINING
 BLACK JACK PROPERTY
 GRAND COUNTY, UTAH
 COAL OWNERSHIP
 FIGURE 4-1

The present use of the surface by the surface owners is to graze livestock in the spring for a very limited time as the land is not very productive.

Checking with the U.S. Bureau of Land Management who manages the federally owned land to the South, West, and partially to the North of the property, they stated that it would take 50 acres of side canyon land to support one AMU (animal month unit), and the bottom land would take between five to ten acres for each AMU. The total grazing capability of the 160 acres would be 3 AMU for the side canyon, plus 1 AMU for the bottom land for a total of 4 AMU equivalent per month for the property.

The few acres that have been used in making access roads and mining pads for the mines would make very little difference in the amount of livestock grazing that could be utilized on the property. There is very little vegetation that would be of any economic value except perhaps cedar posts for fencing or perhaps some pinon pine for support timbers used in the mine.

The property lacks good soils and has a very steep topography. The slope percentage ranges from 67% maximum down to an average of about 30%. Included in the slopes are the vertical sandstone cliffs with the intervening shale slopes.

UMC 783.22(b) Previous Mining

The mine plan area has had two separate coal mines that mined two separate coal seams. The oldest mine started about

1900 and was mined by Reed Lance from 1946 to 1954. These mines were on the "C" or Chesterfield coal seam and the mining method was basically entry and crosscut with some pillar removal (See Plate 3-5).

UMC 783.22(b)(3) The Extent of Coal Removed

The "B" seam was mined both by Lance and by West Pac Mining, the latter during 1978. Coal production was accomplished by the room and pillar method of mining. According to the production records that could be found a total of 4200 tons was mined by West Pac using an underground coal mining machine. Calculating the mined area an additional 3500 tons was mined from the Ballard Seam. The Chesterfield Seam was mined in two areas, one above the Ballard Seam Mine and the other near the northeastern part of the property. Both of the mined areas are calculated to have about 9400 tons of coal removed from both mines from the Chesterfield Seam (See Plates 1-3).

When the coal mining operations on the property have terminated the property will then be restored and reclaimed and then the primary use of the property will revert back to only that of grazing livestock

At the present time the Patsantaras Land and Livestock Company of Grand Junction, Colorado, the owners of the surface rights on the NE 1/4 Section 29, T20S, R20E, graze their livestock in the spring of the year on the property. There are grazing permits issued by the BLM on surrounding area owned by the U.S.

Government. The rocky soil and outcrop conditions, the lack of rainfall and the steep slopes all restrict the productivity of plant life on the property.

The land will continue to be used for livestock grazing and for wildlife habitat during the mining operations, the same use as the land is presently being utilized.

(UMC 817.133)

UMC 784.15 RECLAMATION: POST MINING LAND USE

As before mining, land use and utility are limited by the area's geographical features, mainly steep sloped canyons with shallow and rock soils.

Plant productivity shall equal the reference area which shall be measured on completion of rehabilitation of the mine site. This will allow the livestock to be maintained at a maximum rate which will be as good as prior to the mining operation.

UMC 784.15(a)(1) Achieving Post Mining Land Use

Reclamation work as outlined in the reclamation section states:

1. Reshape disturbed surfaces to lessen sediment loading during storm run-off.
2. Revegetate all disturbed areas with native plants, trees, shrubs, forbs, and grasses as set out in detail in the Revegetation Section of this report.

The main mine area structure will remain in place allowing for a relatively flat, stable planting surface which should provide a more productive vegetative growth due to water infiltration rates and depths.

It is planned, following mining, to restore the small acres affected by the mining operation to its premining state. Grazing permits are presently issued for areas surrounding the surface operations by the Bureau of Land Management and they have stated no foreseeable changes to its present use in the future.

The present owner of the surface land is a livestock company which grazes sheep on the area each year.

County zoning for this general area is grazing and mining. The postmining land uses are the same as premining land uses which is the grazing of sheep.

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FEB 07 1986

CHAPTER V

HISTORICAL AND CULTURAL RESOURCES

UMC 783.12

UMC 784.17

**DIVISION OF
OIL, GAS & MINING**

Prepared For

NEW TECH MINING CORPORATION

MOAB, UTAH

Revised

September 3, 1985

By

EMPIRE ENGINEERING & LAND SURVEYING

86 North 200 East

Price, Utah

84501

CHAPTER V

HISTORICAL AND CULTURAL RESOURCES

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HISTORICAL AND CULTURAL RESOURCES
 UMC 783.12, UMC 784.17

UMC 783.12(b) ENVIRONMENTAL RESOURCE INFORMATION:

New Tech Mining Corporation owns the mineral rights to the NE 1/4 Section 29, T.20S., R.20E., Salt Lake Base and Meridian.

UMC 783.12(a) Size, Sequence and Timing of Mining

The NE 1/4 of Section 29, contains 160 acres with four mineable coal seams on the property. The upper most or Carbonera Seam is not considered for mining under this permit because of the small area available. The other three coal seams are being considered for mining.

The following shows the acres within the outcrop and the acres beyond the outcrop for each seam within the permit area:

Coal Seam	Within Outcrop	Beyond Outcrop
Carabonera		
Chesterfield (C)	117.17 Acres	42.83 Acres
Ballard (B)	126.91 Acres	33.09 Acres
Palisade (P)	142.16 Acres	17.84 Acres

The sequence and timing of mining is described in Chapter II, under UMC 782.17, page 2-7 to 2-9.

UMC 783.12(b) CULTURAL AND HISTORICAL RESOURCES

5.1 SCOPE

A generalized literature review of the area was made in regard to historical or cultural aspects. Then a more detailed search was made on the specific site of the property for any

historical or cultural resources, both in literature and on the ground.

5.2 METHODOLOGY

A review of the literature was made for general area information. An archeological survey was done on the property to determine whether any protection would be required for any pre-historic area of value. On-the-ground observations were made for any paleontological resources of value. None of these studies resulted in any resources of value.

5.3 HISTORICAL RESOURCES

5.3.1 HISTORICAL INVENTORY

The permit area in Thompson Canyon has been used as grazing for animals by ranchers in the area since the turn of the century. There is an old abandoned homestead that is located just to the north of the 160 acre tract of the proposed mining permit area. There have been three areas of small mines located in Secation 29 since the 1940's but the production has been very small and limited to local markets (Moab, Green River, Thompson). The mining activity of Sego never developed into Thompson Canyon even though the coal mines extended their workings all the way through from Sego to the outcrops in the east side of Thompson Canyon.

5.3.2 HISTORY OF MINING

While coal mines were extensively developed in Sego Canyon and coal was mined through the hill in to Thompson Canyon, there has been very little coal produced from the Black Jack property to date. A few tons of coal was produced for local use until 1946 when Mr. Reed Lance opened the Chesterfield Seam near the Northeast Corner of the property. There were 3,482 tons of coal mined from 1946 to 1953 from this mine (Doelling and Graham, 1972).

In 1975 West Pac Mine opened up the Ballard Coal Seam and mined approximately 4,200 tons of coal before closing down the mine in 1978 (H. Lile, personal comm.). Several other companies have looked at the property since 1978 including the Executive Coal Company which started some engineering studies; however, none of these companies ever got into production. In Sego Canyon, just east of Thompson Canyon, coal mining started in 1900 and continued until 1953 when the D & RGW Railroad converted their steam locomotives to diesel engines. A cumulative production from the Sego Canyon Coal Mine was 2,606,00 tons during that period of time. The Sego Canyon mines have mined all the way through the mountain from Sego Canyon to the east side of Thompson Canyon.

5.3.3 EFFECTS OF MINING ON HISTORICAL RESOURCES

There will be no effect of mining operations on the historical resources of the area.

5.4 ARCHEOLOGICAL INVENTORY

The K. K. Pelli Cultural Management Specialists of Moab, Utah were contacted to do the archeological resource assessment on the New Tech Mining Corporation mining property located in Thompson Canyon, Utah (See Enclosure 5-1). There was nothing of significance found on the archeological survey of the property.

5.4.1 EFFECT OF MINING ON ARCHEOLOGICAL RESOURCES

There will be no effects of mining on archeological resources because there are no archeological resources found on the property.

5.5 PALEONTOLOGY

5.5.1 PALEONTOLOGICAL INVENTORY

There are no known fossil localities on the property. The only possible fossils would be fossilized leaves, plants or tree limbs within the area. No dinosaur or other vertebrate fossils have been reported from this area.

5.5.2 EFFECTS OF MINING ON PALEONTOLOGICAL RESOURCES

There will be no adverse effects on the paleontological resources by the mining operations, as no paleontological resources are present in the area.

UMC 784.17 PROTECTION OF PUBLIC PARKS AND HISTORIC PLACES

No public parks (state or federal) are located in or adjacent to the permit area. No historic places are listed or designated in or adjacent to the permit area. No cultural resource sites are identified in an archeological survey conducted by K. K. Pelli Cultural Resource Management Specialists (Pierson) in 1983 as included in Section 5.4 of this chapter.

5.6 REFERENCES

Archeological-Environmental Research Corp., Aug, 1980
"Summary Report", BLM Files.

Dowelling, H.H. and Graham, R.L., 1972, "Eastern and Northern
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Hauck, F. R., 1977, "Cultural Resource Evaluation in Central
Utah, 1977", Utah BLM Cultural Resource Series No. 3,
Salt Lake City, Utah

Lile, H., personal communications, 1983.

Cultural Resource Investigations at
the Thompson Canyon Coal Mine

by
Lloyd M. Pierson

May, 1983

for
New Tech Mining Co.

A CULTURAL RESOURCE
REPORT FROM:

K.K. Pelli



CULTURAL RESOURCE MANAGEMENT
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Introduction

K.K. Pelli Cultural Resource Management Specialists of Moab, Utah were asked to inspect a proposed coal mine development for possible cultural resources by Mr. Harvey W. Merrell, Consulting Geologist of Moab, Utah employed by New Tech Mining Co. The inspection was completed on May 12, 1983 after having been shown the mine operation perimeters by Mr. Merrell. K.K. Pelli CRM Specialists operates under a Department of Interior Antiquities Act Permit Number 82-Ut-064 dated December 15, 1981 and a letter from the State Division of History dated June 2, 1981 indicating approval. All work was done by Lloyd M. Pierson and Marian M. Pierson, archeologists.

Literature searches were made of the files of the Grand Resource Area, BLM, Moab; K.K. Pelli files and library and the libraries of Mr. Merrell, Robert R. Norman, geologist and the Grand County Public Library. Contact by phone was also made with Bruce Louthan, BLM District Archeologist regarding procedures as the property in question is private surface and private minerals. A state minerals inspector at the mine clarified the state procedures in this case.

Copies of this report will be sent to the client, Mr. Merrell, the State Minerals Division, the State Division through the State Minerals Division, and the BLM's District Office in Moab and the Grand Resource Area Office, the latter two as a courtesy.

Project Area Description

The coal mine development proposal is the reopening of two previously mined areas in the NE $\frac{1}{4}$ of Section 29, Township 20 South, Range 20 East.



Figure 1. The Mine.

The smaller of the two areas is in the main Thompson Canyon in the northeast corner of the property and on the dirt road that runs up the canyon. It presently consists of at least one adit with a bulldozed road leading up to it from the canyon road. A large fan is still in place near the mouth of the adit and a four-wheeled mine car lies overturned below it.

The larger area is in a small side canyon that runs westerly from the main Thompson Canyon. The mining activities here consists of several adits and coal exposures at various elevations representing different veins of coal all connected by a series of dugway roads zig zanging up the talus slope. Several concrete slabs and a scale pit remain along with a metal coal chute and several mine cars to show the scale of operation at one time. Most of this is on the north side of the canyon with one area of development in the bottom of the canyon on the south side.

Needless to say that most of the area has been disturbed but between the various levels and around the perimeter were undisturbed areas.

Soils on the 20 to 30 degree talus slopes were a sand/clay material derived from the Mesa Verde formation. Cover is a pinyon-juniper complex. Elevation is between 5700 and 6000 feet.

Previous Work and History

In Hauck's (1977, pp. 139-147) 1% sample of the Central Utah Coal resource area he sampled 3 quarter sections in the same township as the Thompson Canyon Coal Mine. In one quarter section he found two lithic scatters which he dates as early Archaic. Archeological-Environmental Research Corporation (1980, August) cleared a seismic line up Thompson Canyon almost as far as the Thompson Canyon Coal Mine for ARMA Geophysical Company finding no sites in Section 29 or the immediate vicinity.

The famous pictograph panels just below the junction of Thompson and Segó Canyons, about $1\frac{1}{2}$ miles from the mine, known as the Thompson Canyon Pictographs are on the National Register of Historic Places. These panels have representative rock art from all but one of the prehistoric cultures inhabiting this part of Utah. Paleo-Indian glyphs are unknown but present here are Archaic, Anasazi, Fremont and Ute rock art. The art indicates their intensive use of the canyon which must have been one of the principal routes up into and over the Book Cliffs. Even the latter day cultures are represented as initials and names of people from the now deserted and ruined coal mining community of Segó in Segó Canyon and railroad employees left their contributions to posterity. The one Japanese kanji petroglyph present translates: "A Greater Japan", which dates it as pre-World War II.

Coal mining in both Thompson and Segó Canyons began at the turn of the century (Doelling, 1972). The coal from Thompson Canyon went to the local market while that of Segó was used either by the railroad or hauled by them to outside markets. A spur of the D&RGW ran to the town of Segó. The last operation of the Thompson Canyon Coal Mine is indicated by the sign on the gate: "Wes Pac Energy; Thompson Coal Mine".

Survey Procedures and Results

Although the coal mining property covers the entire NE $\frac{1}{4}$ of the section only those undisturbed lands in and about the proposed operation that might be impacted by the expansion of the mine were investigated. Some of the property has already been totally disturbed and much of it is sheer cliffs and steep talus slopes. The more level parcels of land

were covered on foot in 10 meter swaths by one or two archeologists. The steeper slopes were covered by one archeologist walking the contours to cover the undisturbed land between the developed areas.

There are some mining artifacts in and about both development areas; mostly mine cars and other metal objects. These are of recent vintage and belong to the mining company. The mine itself has little significance in the mining history of the region. Only one lonely pink chert chip was found on the long tongue of land above the entrance road and it was deemed of little value. There are no cultural resource problems connected with the development of the Thompson Canyon Coal Mine.

Bibliography

Archeological-Environmental Research Corp.
August, 1980 "Summary Report" BLM Files

Doelling, H.H. and R.L. Graham
1972 "Eastern and Northern Utah Coal Fields". Monograph Series
No. 1, Utah Geological and Mineral Survey, Salt Lake City.

Hauck, F.R.
1977 "Cultural Resource Evaluation in Central Utah 1977"
Utah Bureau of Land Management Cultural Resource Series,
No. 3, Salt Lake City.

Spring

63957

CLEARED
AREAS

Water
Tank

29

6000

28

6000

THOMPSON

6707

6677

USGS SEGO CANYON QUID
Thompson Coal Mine
Clearance

6558
740

6000

32

33

6347

5.5.2 Effects of Mining on Paleontological Resources

There will be no adverse effects on the paleontological resources by the mining operations.

5.6 Protection of Public Parks and Historic Places (784.17)

No public parks (state or federal) are located in or adjacent to the permit area.

No historic places are listed or designated in or adjacent to the permit area.

No cultural resource sites are identified in an archeological survey conducted by K. I. Pelli Cultural Resource Management Specialists (Pierson) in 1983 as included in Section 5.4 of this chapter.

5.7 References

Archeological-Environmental Research Corp., Aug, 1980,
"Summary Report", BLM Files.

Dowelling, H.H. and Graham, R.L., 1972, "Eastern and Northern Coal Fields." Monograph Series #1, Utah Gas and Mineral Survey, Salt Lake City, Utah.

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Lile, H., personal communications, 1983.

CHAPTER VI

GEOLOGY

UMC 783.14

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**DIVISION OF
OIL, GAS & MINING**

Prepared For

NEW TECH MINING CORPORATION

MOAB, UTAH

The revision to this chapter has been extensive enough to print the entire chapter. No pages will carry a revised date.

Revised October 14, 1985

MAPS NOT REVISED

H2-1 Surface Geology of Thompson Canyon Area
3-1 Geology Map
3-2 Structure Map
3-4 Stratigraphic Cross Sections
3-5 Present Mine Workings

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CHAPTER VI
GEOLOGY
UMC 783.14

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CHAPTER VI

GEOLOGY UMC 783.14

6.1 SCOPE OF GEOLOGIC STUDY

The geological review of the northern Paradox Basin region was made for background information and then the more detailed geological study and evaluation was made on the specific 160 acres of the requested mine permit.

6.2 METHODOLOGY

The Black Jack #1 Mine area is located in the central part of the Sego Coal Field in Grand County, Utah.

This area is in the southern part of the Book Cliffs that is very heavily eroded and cut by steep canyons and with very little soil or vegetation. The relief ranges from 5700 feet to 7100 feet in the general area while on the property 5760 feet is the minimum elevation to the maximum of 6680 feet. The general dip of the strata throughout the mine plan area is to the northwest at approximately three to four degrees (Bailey). East of the mine plan area, the dip is approximately three to four degrees to the northeast, indicating the existence of an anticline (Bailey).

Geologic formations exposed within the property area are members of the Price River Formation (PRF) from the Mesa Verde group of the Cretaceous age (see Plate H2-1). The principle coal

seams are found in the Neslen Member (kn) of the Price River Formation. There are three principle coal seams located within the mine plan area, i.e. The Chesterfield, the Ballard, and the Palisade, in descending order.

The data used for compiling the geology was from previous geology reports on the region as well as from surface and underground geological examinations on the property. Old data that was available on the property was also used as sources for information. The hydrology will be discussed in detail in a later part of this report.

6.3 REGIONAL GEOLOGIC FRAMEWORK

The Thompson Canyon Property is located in the northern edge of the Paradox Basin which was a depositional basin during Pennsylvanian Time with marine carbonates, shales and evaporites being deposited. At Late Pensylvanian - Early Permian Time the northeast part of the Paradox Basin was uplifted to form the Uncomphagre Uplift. The subsequent erosion of the Uncomphagre Uplift provided the sediments for many thousands of feet of arkosic Cutler Formation to be deposited into the Paradox Basin.

Later during Triassic Time the Uncomphagre Uplift was covered with sediments. The Uinta Basin was formed during Early Cretaceous Time and many thousands of feet of sediment were

deposited in this subsiding basin. The uplift and erosion of these Cretaceous sediments at the southern end of the Uinta Basin have left the Book Cliffs as a topographic feature.

The Cretaceous Sea that retreated eastward across the area deposited lagoonal deposits on the edges of the continental-marine transition zone. The Lower Mesa Verde, the Blackhawk Formation, had thick coal seams deposited to the west of the Segó Field and later the younger Price River Formation had coal seams deposited in the Segó Field mainly in the Neslen Member of the Price River Formation. Later deposits of continental sediments replaced the lagoonal deposits, the coal accumulation ceased, and only shale and sand sequences were deposited.

6.4.1 STRATIGRAPHY

The beds exposed as the Black Jack #1 Mine Property is restricted to the Price River Formation of the Mesa Verde Group of Upper Cretaceous Age. Exposures of the Segó Sandstone Member, the Neslen Member (major coal seams), and the Farrer Member are on the property, in addition there are alluvial deposits along the bottom of Thompson Wash in Thompson Canyon. A discussion of other stratigraphic units will be given in order to supply more fully the background of the geology of the area. See Table 6-1, Generalized stratigraphic section - Segó Coal Fields.

MANCOS SHALE is a gray marine shale that is limy and bentonitic in part. There are a few sandy or silty beds occurring within the shale unit. The Mancos Shale outcrops below the Book Cliffs and forms the topographic flat that extends southward for several miles. The thickness of the Mancos is between 3500 and 4500 feet.

PRICE RIVER FORMATION

CASTLEGATE SANDSTONE is the first cliff forming sandstone above the Mancos Shale along the Book Cliffs. The top of the Castlegate sandstone usually forms a dip slope or bench that extends back from the outcrop. The Castle Gate is a massive, light-gray to yellow-gray sandstone that weathers to a brownish color. The sand size ranges from fine to coarse grained and contains occasional carbonaceous streaks within the sandstone and is from 10' to 190' thick.

BUCK TONGUE MEMBER OF MANCOS SHALE

The Buck Tongue Member is a gray marine shale that separates the Castlegate Sandstone and the Sego Sandstone Members of the Price River Formation, and is, therefore, located beneath all coal bearing zones. It is similar to the Mancos Shale in appearance, lithology, and weathering characteristics (Doelling, 1972). Lithologically, it is composed of medium to dark-gray marine shales with subordinate littoral sandstone, weathering to

drab gray color when dry (Fisher, 1936). The shale is limey, feels gritty, and carries veinlet of gypsum and calcite (Fisher, 1936). The buck Tongue Shale is approximately 200 feet thick (Doelling, 1973). The Buck Tongue Member connects with the main Mancos Shale body east of the Colorado state line where the Castlegate Sandstone feathers out. The thickness is from 100' to 350' feet.

SEGO SANDSTONE MEMBER OF THE PRICE RIVER FORMATION

The Sego Sandstone Member of the Price River Formation forms the next cliff above the Castlegate Cliff (the 2nd cliff above the Mancos Shale). This sand is fine to medium grain sized and is slightly calcareous. The color is from buff to light gray and is mostly a massive sand with some shaley beds in parts. The shales are similar lithologically to the Buck Tongue previously described. Shale layers, located throughout the Sego Sandstone, would act as effective barriers to downward movement of water within the formation, thereby greatly reducing its overall vertical permeability. The Sego Sandstone Member averages approximately 175 feet in thickness. (Fisher, 1936). The thickness ranges from the 140' to 215'.

NESLEN MEMBER OF THE PRICE RIVER FORMATION

The Neslen Member of the Price River Formation consists of sandstone, siltstone, shale and coal. The sandstone color is buff to gray and the grain size is fine to medium grained. The

beds are massive to thin bedded and are basically step-like in the outcrop and forms a steep cliff that is difficult to climb. The sandstone of the Neslen Member is similar to that of the Segó Sandstone with the exception that it is thinner, less persistent and forms less pronounced cliffs (Doelling, 1972). It is composed of "equal proportions of alternating sandstones weathering buff to light gray and shales weathering light gray" (Fisher, 1936). Similar to the shale layers of the Segó Sandstone, the shale layers of the Neslen Member also act as barriers to the vertical movement of water within the formation, greatly reducing vertical permeability and limiting water carrying capabilities. The Neslen Member averages 350 feet in thickness (Fisher, 1936). The thickness ranges from 250' to 410'. The major coal seams that carry over a wide area have been named but there are additional coal seams that have not been named that have local economic values as potential coal deposits. The coal seams named in the Thompson Canyon - Segó Canyon area are: Palisade Seam (lowest) which occurs about 50 feet above the Segó Sand. The Ballard Seam is the next named coal seam and is about 42 feet above the Palisade Seam and about 150 feet above the Segó Sand. The Chesterfield Seam occurs about 10 to 50 feet above the Ballard Seam. There the Carbonera Seam occurs about 110 feet above the Chesterfield Seam. On the Black Jack Property the Ballard and Chesterfield coal seams have been mined in the past and the

Palisade coal seam, about 42 feet below the Ballard Seam has not been mined. The Carbonera has a mineable thicknesses of about 60" on the Thompson Canyon Property. The mineable thickness of the other seams on the property are Chesterfield 60", Ballard 42" to 45", and Palisade 48".

FARRER MEMBER OF THE PRICE RIVER FORMATION

The Farrer Member, the uppermost member of the Price River Formation, is also the uppermost geologic unit within the Black Jack #1 mine plan area. The Farrer Member is similar to the Nesler Member with the exception that it contains "a larger percentage of sandstone and a paucity of coal beds" (Doelling, 1972). The Farrer Member consists of fine-to-medium-grained sandstone interbedded with shale and siltstone. The shales are silty and dark gray with some greenish tint (Doelling, 1972). The sandstones are fine to medium grained and are light brown in color. The shales are gray to light greenish-gray in color. There are very few if any coals developed in this rock unit. The thickness ranges from 410 to 1095 feet.

TUSCHER FORMATION

The Tuscher Formation conformably overlies the Farrer Member of the Price River Formation and is composed of sequences of sandstones that are somewhat coarse grained to conglomeratic in part. The sand beds are split by thin shale beds. The Tuscher

Formation is Very Late Cretaceous to Early Tertiary in age. The thickness ranges from 130 to 600 feet.

WASATCH FORMATION

The Wasatch Formation lies unconformably on the Tuscher Formation. This formation consists of varicolored shales with sandstones and conglomerates toward the base. There are occasional fresh water limestones in the lower part of the formation. The Wasatch Formation thins rapidly towards the east with 3000 feet thickness near the Green River and only 250 feet thickness near the Colorado state line.

GREEN RIVER FORMATION

The Green River Formation is the uppermost sequence of beds in the Book Cliffs and is composed of thick sequences of shales, marlstones, claystones, algal reefs, sandstones and rich organic material in Tar Sands and in Kerogen Shales known as "oil shales". The total section of Green River is not exposed in the Book Cliffs area but is 2,400 feet thick near the Colorado state line.

6.4.2 GEOLOGIC STRUCTURE

The geologic structure in the Black Jack #1 Mine area is fairly simple. The sedimentary strata are gently dipping northward at 2 to 4 degrees away from the northwest trending Thompson Anticline. This low relief fold had graben faulting in the area south of the Black Jack property and this faulting apparently dies out to the north. The faulting parallels the axis of the Thompson Anticline. There is an apparent extension of this fault graben zone that begins again in T20S, and R19E, and continues northwestward into T19S, R19E, for a distance of about 8 miles (Plate 3-2).

Local faultings are found in the Black Jack Mine in the "B" Seam in two different areas (See Plate 3-2). One fault trends N 15 degrees W. with an 80 degree East dip. The offset appears to be 5.0 feet. The other fault strikes N. 27 degrees W. and dips 85 degrees West. The displacement on this fault is 4 feet plus.

6.5 GEOLOGY OF COAL BED AND ADJACENT UNITS

Geological units in the project and adjacent areas are of Cretaceous age, these include from oldest to youngest, Mancos Shale, Castlegate Member of the Price River Formation, the Buck Tongue member of the Mancos, the Segoe Member, the Neslen Member (coal bearing) and the Farrer Member of the Price River Formation and the Tuscher Formation.

Three coal seams are present and have been measured at 3.5 to 5 feet in thickness with the seams thickening and thinning in local areas. The seams have been called or named the Palisade or "P" Seam which is the lowest, the Ballard or "B" Seam which is the middle coal seam, and the Chesterfield or "C" Seam which is the highest mineable coal seam exposed on the property.

The structure of the Thompson Canyon Property area is that of gently dipping beds to the north at a rate of 2 to 4 degrees. This dip is controlled by the Thompson Anticline to the west and trending northwestward the few normal faults in the area also trend to the northwest.

6.5.1 EXPLORATION AND DRILLING

There has not been any surface drilling done on the property. The exploration has been limited to the present mine workings that are accessible at this time and to the few exposures of coal seams on their outcroppings in the canyon walls.

The small area to be mined on the private property is a maximum of 141.4 acres in the Palisade Seam, and the good exposures of the coal seams along the canyon walls have led to the decision by the management of New Tech Mining not to do any surface drilling for core samples. Any drilling would require major work to build roads and drill pads and the information obtained is not needed on this small scale operation.

The lack of any ground water encountered in any of the mine workings also indicates that drill holes for ground water information at this time is not needed.

6.5.5 COAL RESERVES

The calculated coal reserves on the property held by New Tech Mining Inc, are dependent upon the following considerations for each of the three mineable coal seams:

- 1) The density of the coal in place is 80 lbs./ft.³ or 25 cu. ft. per Ton.
- 2) The height of coal in each seam. See Table 6.2.
- 3) Mining Barriers - Property barriers at north, west and South and Outcrop barriers along out crop to east part of permit area. See Table 6.2.
- 4) Protective Barriers - To protect portals, facilities and drainage channels:

Property Barriers:

The property barrier along the north property line is 60 feet on the east end and 70 feet to the west for an average width of 65 feet. The barrier along the west property line is 70 feet

at the north and 80 feet at the south for an average width of 75 feet. Along the south property line the barrier is parallel at 130 feet wide to the outcrop lines of the three seams. The property barriers will not be mined and are classed as non-mineable coal.

Outcrop Barriers:

The quality of coal, due to oxidation, along the outcrops is usually very poor. Therefore, there will be no mining within 50 feet of the outcrop in any seam. There is a vertical interburden of about 36 feet between the C and B Seams and between the B and P Seams (about 450 feet, less seam height, as shown on topography map). To avoid surface caving there will be no mining in the B Seam beyond the outcrop of the upper C Seam and also no mining in the P Seam beyond the B Seam outcrop. The mining has been extended as close to the outcrops as possible, according to the restrictions listed, and the area remaining is classed as non-mineable coal.

Protective Barriers:

The outcrop barrier has been extended around the portal entries in all three seams and around the inclined tunnels in the B and P Seams to protect these facilities. The restriction to mine in the P Seam beyond the B Seam outcrop prohibits mining of the P Seam under the yard facilities in the canyon and protects

these facilities. Another protective barrier extends across the 5 entries along the west property line and some 12 or more pillars are shown in each seam as non-mineable. These pillars are left to protect the dry drainage channel, in the event it is required to pull pillars.

The only mining within any of the barriers, property and outcrop, will be access portals and entries with crosscuts as projected for mining during this permit and previous mining. The volume of coal previously mined and to be mined will be deducted from the barrier or non-mineable coal. This will then place this volume in the mineable reserves when the non-mineable coal is deducted from the total seam coal available. It will then be deducted from the mineable coal reserves as either previous mining or projected mining during permit. The percent extraction in each seam will be the volume of coal mined during this permit divided by the mineable reserves in the seam times 100.

Following is a table of classified land and coal within the 160 acres of the permit area, by seams:

TABLE 6-2

	<u>CHESTERFIELD</u>	<u>BALLARD</u>	<u>PALISADE</u>
Seam Height	60" (5.0')	42"-48" (3.75')	48" (4.0')
Non-coal Land-Acres	42.83	33.09	17.84
Total Seam Coal-Acres	117.17	126.91	142.16
Total Seam Coal-Tons	1,020,820	829,217	990,777
Non-Mineable Coal-Acres	26.64	37.65	48.59
Non-Mineable Coal-Tons	232,088	246,003	338,681
Mineable Reserves-Acres	90.53	89.26	93.56
Mineable Reserves-Tons	788,732	583,214	652,097
Previous Mining-Tons	10,776	6,351	0
Reserves-This Permit-Tons	777,956	576,863	652,097
Mining-This Permit-Tons	258,555	241,445	0
Percent Extraction	33.24	41.85	0
Remaining reserves-Tons	519,401	335,418	652,097

As noted in the table 6.2, the Ballard Seam will be mined out except for pillar recovery, if required. However, pillar recovery in the B Seam should not be done until the above C Seam is completed, including pillar recovery, Mining is superimposed so pillars in all Seams rest one above the other or in solid unmined coal as in the case of outcrop pillars that vary from seam to seam.

6.5.2.1 COAL QUALITY AND CHARACTERISTICS

Table 6-3 is the Proximate Analysis on a Thompson "B" Seam sample. Table 6-4 gives the Grindability Index, Free Swelling Index, and the Percent Equilibrium Moisture.

Table 6-5 is the Mineral Analysis of Ash and the Silica Value.

Table 6-6 is the Float and Sink Analysis and the Free Swelling Index of Thompson "B" Seam coal.

Table 6-7 is the Washability Curves on Thompson "B" Seam coal.

6.5.3 OVERBURDEN

The thickness of the overburden covering the coal reserves in the Black Jack #1 Mine area ranges from 20 feet to 880 feet. Because of the great relief of the topography of the land, the thickness of the overburden is highly variable. An average overburden thickness for the coal reserves is about 350 feet.

6.5.3.1 ROCK CHARACTERISTICS

The rock characteristics are that of non-acid nature with very little or no pyrites present that could combine with water to form acids. Table 6-8 to 6-17 show the assays on the rock above and below each coal seam.

6.6 GEOLOGIC EFFECTS OF MINING

There will be little or no geologic effects of mining.

6.6.1 MINING HAZARDS

There are no apparent mining hazards due to geologic conditions. The backs of the present workings in the "B" Seam is a good hard sandstone that requires very little roof bolting, the other two seams have more shale in the back and will require more roof bolting.

6.6.2 SURFACE HAZARDS

The overall steep slopes to the canyon walls make road building difficult. The present road system is mainly restricted to the bench area at the Black Jack #1 Mine. The lack of abundant flat space in the canyon bottom for facilities makes a more compact operation.

6.6.3 IMPACTS OF MINING

There will be very little additional impacts of mining on the property, with the exception of construction of the settling ponds and the culvert for the surface runoff of the water in the water drainage basin above the mine area. The roads and mining pads were constructed for past mining operations and no additional disturbance is contemplated.

6.7 BIBLIOGRAPHY

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APPENDIX 6

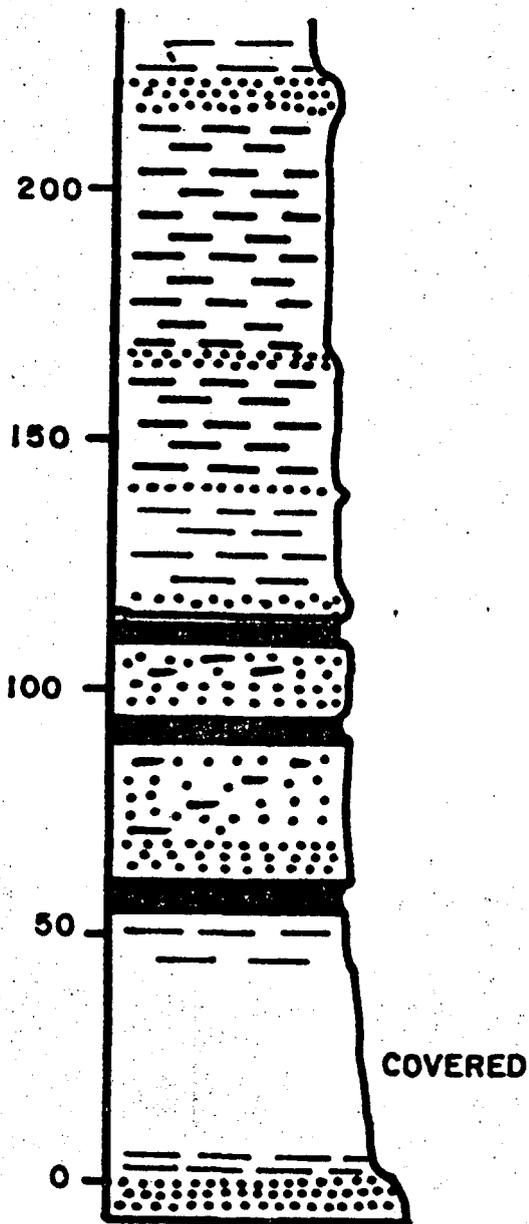
Chapter VI

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6-3	Proximate Analysis
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6-5	Mineral Analysis Ash
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PLATE list Chapter VI

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NEW TECH MINING
BLACK JACK MINE PROPERTY
GRAND COUNTY, UT.
MEASURED STRATIGRAPHIC SECTION

TABLE 6-1

GENERALIZED STRATIGRAPHIC SECTION
SEGO COAL FIELD

System	Series	Stratigraphic Unit	Thickness (feet)	Description	
TERTIARY	Eocene	Green River Formation	-	Greenish gray and white claystone and shale, also contains fine-grained and thin-bedded sandstone. Shale often dark brown containing carbonaceous matter. Full thickness not exposed.	
		Wasatch Formation	250-3,000	Varicolored, predominantly purplish red shales with heavy cliff-forming gray sandstones with basal conglomerate, thins eastward. Unconformity ?	
	Paleocene	Tuscher Formation	130-600	Light gray to cream-white sandstones with subordinate buff to gray shale. Unconformity ?	
CRETACEOUS	Maestrichtian				
	Campanian	Price River Formation	Farrer Member	410-1,095	Yellow-gray to brown sandstones with greenish gray shales.
			Neslen Member Major Coal Seams	250-410	Yellow gray to brown sandstone and gray shales in equal proportions, contains carbonaceous shale and coal.
			Sego Sandstone	140-215	Mostly yellow-gray sandstone, massive and cliff forming, in a few places thin-bedded, makes one to four cliffs.
			Buck Tongue of Mancos Shale	100-350	Gray marine shale with subordinate littoral sandstone, thins westward.
			Castlegate Sandstone Minor Coal	10-190	Yellow-gray to brown sandstone, very fine to very coarse-grained, massive-to thin-bedded cliff former, occasional thin shale beds and coal.
CRETACEOUS	Santonian	Mancos Shale	3,500-4,500	Mostly gray marine shale, contains remnants of Blackhawk Formation in upper 200 feet in west part of field, consisting of yellow gray cliff-forming sandstone, may carry thin beds of coal in this upper part	
	Coniacian				
	Turonian				
	Cenomanian	Dakota Sandstone	2-126	Sandstone and conglomerate with interbedded gray shales, often forms hogback.	

Table 6-3
CALL ADDRESS COMTECO

COMMERCIAL TESTING & ENGINEERING CO.

GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 • AREA CODE 312 728-8434

PLEASE ADDRESS ALL CORRESPONDENCE TO:
5 EAST 51st AVE., DENVER, COLO. 80239

OFFICE TEL. (303) 373-4772



WESTERN AMERICA ENERGY CORPORATION
P. O. Box 1053
Price, Utah 84501

Sample Identification
by

Kind of sample reported to us	Coal	Western America Energy Corp.
Sample taken at	XXXXX	Thompson B Seam
Sample taken by	Western America Energy Corp.	
Date Sampled	XXXXX	
Date Received	6-2-75	

Analysis report no. 72-31073 Page 1
PROXIMATE ANALYSIS

	<u>As received</u>	<u>Dry basis</u>
% Moisture	7.06	XXXXX
% Ash	14.29	15.38
% Volatile	34.37	36.98
% Fixed Carbon	44.28	47.64
	<u>100.00</u>	<u>100.00</u>
Btu	11073	11914
% Sulfur	0.59	0.63

FUSION TEMPERATURE OF ASH

	<u>Reducing</u>	<u>Oxidizing</u>	
Initial Deformation	XXXXX	XXXXX	H is Cone Height
Softening (H=W)	XXXXX	XXXXX	
Softening (H=1/2W)	XXXXX	XXXXX	W is Cone Width
Fluid	XXXXX	XXXXX	

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

L.W. Taylor

L.W. TAYLOR, Western Division Manager



LWT/pf

COMMERCIAL TESTING & ENGINEERING CO.

GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 • AREA CODE 312 728-8434

PLEASE ADDRESS ALL CORRESPONDENCE TO:
10775 EAST 51st AVE., DENVER, COLO. 80239

OFFICE TEL. (303) 373-4772

WESTERN AMERICA ENERGY CORPORATION
P. O. Box 1053
Price, Utah 84501Sample Identification
by

Western America Energy Corp.

Thompson B Seam

Kind of sample
reported to us

Coal

Sample taken at

XXXXX

Sample taken by

Western America Energy Corp.

Date Sampled

XXXXX

Date Received

6-2-75

Analysis report no. 72-31073 Page 2

HARDGROVE GRINDABILITY INDEX = 46.9 at 3.81% Moisture

FREE SWELLING INDEX = 1-1/2

% EQUILIBRIUM MOISTURE = 7.81

Respectfully submitted,

COMMERCIAL TESTING & ENGINEERING CO.

L. W. DAVIDGE, Western Division Manager



LWT/pf

COMMERCIAL TESTING & ENGINEERING CO.

GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 • AREA CODE 312 726-8434

PLEASE ADDRESS ALL CORRESPONDENCE TO:
175 EAST 51st AVE., DENVER, COLO. 80239

OFFICE TEL. (303) 373-4772



WESTERN AMERICA ENERGY CORPORATION
P. O. Box 1053
Price, Utah 84501

Sample Identification
by

Western America Energy Corp.
Thompson B Seam

Kind of sample reported to us Coal
Sample taken at XXXXX
Sample taken by Western America Energy Corp.
Date Sampled XXXXX
Date Received 6-2-75

Analysis report no. 72-31073 Page 3

<u>MINERAL ANALYSIS OF ASH</u>	<u>%</u>
Phos. pentoxide, P2O5	1.12
Silica, SiO2	55.15
Ferric oxide, Fe2O3	1.50
Alumina, Al2O3	35.84
Titania, TiO2	1.11
Lime, CaO	1.87
Magnesia, MgO	1.03
Sulfur trioxide, SO3	0.68
Potassium oxide, K2O	0.30
Sodium oxide, Na2O	1.75
Undetermined	0.10
	<u>100.00</u>

Alkalies as Na2O, DCB = 0.30

SILICA VALUE = 93.32

ESTIMATED VISCOSITY at critical viscosity
temp. of XXXXX °F = XXXXX Poises
T250 = XXXXX °F

Respectfully submitted,

COMMERCIAL TESTING & ENGINEERING CO.

L. W. TAYLOR, Western Division Manager



LWT/pf

WESTERN AMERICA ENERGY CORPORATION

Price, Utah

Thompson B Seam

Lab No. 72-31073-A thru E

FLOAT & SINK ANALYSIS

June 1975

SPECIFIC GRAVITY		Dry Basis				CUM. RECOVERY (Float)				CUM. REJECT (Sink)			
Float	Sink	% Wt.	% Ash	% Sul	Btu	% Wt.	% Ash	% Sul	Btu	% Wt.	% Ash	% Sul	Btu
<u>Crushed to 20 Mesh x 0 before Separation on Organic Liquids</u>													
1.30		25.69	3.12	0.58	13912	25.69	3.12	0.58	13912	100.00	15.11	0.60	11870
1.40	1.30	35.68	9.49	0.61	12793	61.37	6.82	0.60	13261	74.31	19.25	0.60	11165
1.50	1.40	23.96	19.63	0.58	11140	85.33	10.42	0.59	12666	38.63	28.27	0.60	9660
1.60	1.50	7.98	30.88	0.55	9337	93.31	12.17	0.59	12381	14.67	42.39	0.62	7244
	1.60	6.69	56.12	0.71	4747	100.00	15.11	0.60	11870	6.69	56.12	0.71	4747

FREE SWELLING INDEX

1.30 Float = 2

1.40 Float = 1

COMMERCIAL TESTING & ENGINEERING CO.

Job WESTERN AMERICA ENERGY CORP.
 Lab. No. 72-31073-A thru E
 Mine Thompson B Seam
 Size *
 Raw Coal Ash 15.11
 Raw Coal Sul. 0.60

Commercial Testing & Engineering Co.
 CONSULTING FUEL ENGINEERS
 AND CHEMISTS
 CHICAGO, ILL.

Charleston, W. Va.

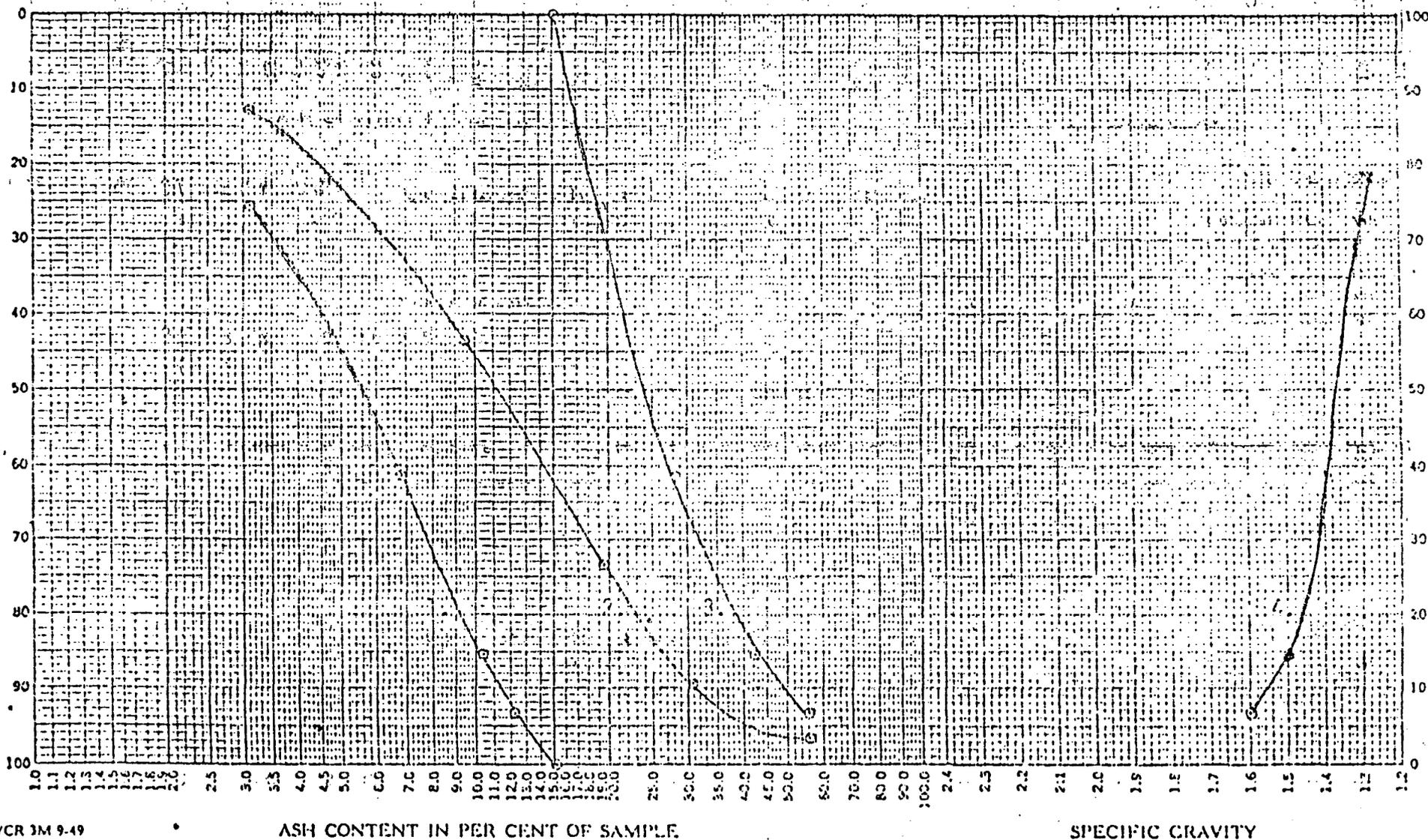
Terre Haute, Ind.

CURVE LEGEND

- 1 Cumulative Coal-Ash
- 2 Coal Characteristic
- 3 Cumulative Refuse-Ash
- 4 Yield-Specific Gravity
- 5 Separation Effected

*Crushed to 20 Mesh x 0 before Separation
 on Organic Liquids

WASHABILITY CURVES



PER CENT WEIGHT REMAINING TO FLOAT OR CLEANED COAL
 6-24 (8/85)

WCR 3M 9-49

ASH CONTENT IN PER CENT OF SAMPLE

SPECIFIC GRAVITY

PER CENT WEIGHT REMAINING TO FLOAT OR CLEANED COAL

Table 6-7


STANDARD LABORATORIES, INC.

3827 PENNSYLVANIA AV.

CHARLESTON, W.V. 25301

304-340-8173

CUSTOMER

NEW TECH MINING CORPORATION
 59 $\frac{1}{2}$ S. MAIN
 MOAB, UTAH 84532

 Lab. No. SEE BELOW

 Date Rec. 6/18/85

 Date Sampled -----

 Sampled by YOUNG, ES

Sample ID

SEE BELOW

TABLE 6-8
CORE LOG

<u>LAB NO.</u>	<u>SAMPLE ID:</u>	<u>ROCK TYPE</u>	<u>COLOR</u>
S-7873	#36161 FAN ENTRY ABOVE SEAM	HIGHLY CALCAREOUS MUDROCK	LSY 7/2
S-7874	#36162 FAN ENTRY BELOW SEAM	CARBONACEOUS SANDSTONE	LSYR 3/2
S-7875	#36163 MAIN PORTAL ABOVE SEAM	SLIGHTLY CARBONACEOUS SANDSTONE	LSYR 6/1
S-7876	#36164 MAIN PORTAL BELOW SEAM	MUDSTONE WITH SANDSTONE	LSYR 3/2
S-7877	#36165 LOWER SEAM ABOVE SEAM	CALCAREOUS CLAY	LSY 6/4
S-7878	#36166 LOWER SEAM BELOW SEAM	CALCAREOUS SANDSTONE	LSYR 5/3

 FOR YOUR PROTECTION THIS DOCUMENT HAS
 BEEN PRINTED ON CONTROLLED PAPER STOCK

Respectfully submitted _____



STANDARD LABORATORIES, INC.

CUSTOMER NEW TECH MINING CORPORATION
 59½ S. MAIN
 MCAB, UTAH 84532

Lab. No. SEE BELOW

Date Rec. 6/16/83

Date Sampled -----

Sample ID SEE BELOW

Sampled by YOURSELVES

TABLE 6-9

ACID-BASE ACCOUNTABILITY

CAC03 EQUIV. (TONS/1000 TONS OF MATERIAL)

<u>LAB NO.</u>	<u>ID:</u>	<u>FIZZ</u>	<u>% SUL.</u>	<u>MAX FROM % SUL.</u>	<u>AMOUNT PRESENT</u>	<u>MAX NEEDED PH 7</u>	<u>EXCESS</u>	<u>PASTE PH</u>
S-7873	SEE LOG	2	<0.001	<0.03	93.90		93.87	8.05
S-7873	SEE LOG	2	<0.010*	<0.31**	93.90		93.59	8.05
S-7874	SEE LOG	0	0.192	6.00	-6.98	12.98		3.81
S-7874	SEE LOG	0	0.020*	0.63**	-6.98	7.61		3.81
S-7875	SEE LOG	0	0.160	5.00	-1.40	6.40		4.35
S-7875	SEE LOG	0	0.010*	0.31**	-1.40	1.71		4.35
S-7876	SEE LOG	1	0.299	9.34	-1.90	11.25		4.90
S-7876	SEE LOG	1	0.020*	0.63**	-1.90	2.53		4.90
S-7877	SEE LOG	1	<0.001	<0.03	47.44		47.41	8.00
S-7877	SEE LOG	1	<0.010*	<0.31**	47.44		47.13	8.00
S-7878	SEE LOG	1	0.161	5.03	41.23		36.20	6.40
S-7878	SEE LOG	1	0.020*	0.63**	41.23		40.60	6.40

* PYRITIC SULFUR COMPONENT

** CALCULATED FROM PYRITIC SULFUR COMPONENT

CUSTOMER: NEW TECH MINING CORPORATION
 59¹ S. MAIN
 MOAB, UTAH 84532

Lab. No. SEE BELOW
 Date Rec. 6/16/33
 Date Sampled -----
 Sampled by YOURSELVES

Sample ID: SEE BELOW

TABLE 6-10

ACID-BASE ACCOUNTABILITY

CAC03 EQUIV. (TONS/1000 TONS OF MATERIAL)

<u>LAB NO.</u>	<u>ID:</u>	<u>FIZZ</u>	<u>% SUL.</u>	<u>MAX FROM % SUL.</u>	<u>AMOUNT PRESENT</u>	<u>MAX NEEDED PH 7</u>	<u>EXCESS</u>	<u>PASTE PH</u>
S-7873	SEE LOG	2	<0.001	<0.03	93.90		93.87	8.05
S-7874	SEE LOG	0	0.192	6.00	-6.98	12.98		3.81
S-7875	SEE LOG	0	0.160	5.00	-1.40	6.40		4.35
S-7876	SEE LOG	1	0.299	9.34	-1.90	11.25		4.90
S-7877	SEE LOG	1	<0.001	<0.03	47.44		47.41	8.00
S-7878	SEE LOG	1	0.161	5.03	41.23		36.20	6.40

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STANDARD LABORATORIES, INC.

3127 WEST WASHINGTON AV. CHARLESTON, W. V. 25302

304-733-5171

CUSTOMER

NEW TECH MINING CORPORATION
59½ S. MAIN
MOAB, UTAH 84532

Lab. No. SEE BELOW

Date Rec. 6/18/83

Date Sampled -----

Sampled by YOURSELVES

Sample ID

SEE BELOW

TABLE 6-11

<u>LAB NO.</u>	<u>SAMPLE ID:</u>	<u>% PYRITIC SULFUR</u>
S-7873	SEE LOG	<0.01
S-7874	SEE LOG	0.02
S-7875	SEE LOG	0.01
S-7876	SEE LOG	0.02
S-7877	SEE LOG	<0.01
S-7878	SEE LOG	0.02

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Respectfully submitted

[Handwritten Signature]

CUSTOMER **NEW TECH MINING CORPORATION**
59½ S. MAIN
MOAB, UTAH 84532

Sample ID **SEE BELOW**

Lab. No. SEE BELOW
 Date Rec. 6/16/83
 Date Sampled -----
 Sampled by YOURSELVES

TABLE 6-12

<u>LAB NO.</u>	<u>SAMPLE ID:</u>	<u>CONDUCTIVITY OF SATURATED PASTE</u>
S-7873	SEE LOG	7,300 µMHOS/CM
S-7874	SEE LOG	1,610 µMHOS/CM
S-7875	SEE LOG	5,300 µMHOS/CM
S-7876	SEE LOG	7,200 µMHOS/CM
S-7877	SEE LOG	1,190 µMHOS/CM
S-7878	SEE LOG	3,600 µMHOS/CM

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STANDARD LABORATORIES, INC.

222 PEARSON AVENUE

SALT LAKE CITY, UTAH

304 243 5773

CUSTOMER

 NEW TECH MINING CORPORATION
 59 1/2 S. MAIN
 MOAB, UTAH 84532

 Lab. No. SEE BELOW

 Date Rec 6/16/83

 Date Sampled -----

 Sampled by YOURSELVES

 Sample ID SEE BELOW

TABLE 6-13

PPM, AS RECEIVED BASIS

<u>LAB NO.</u>	<u>SAMPLE ID:</u>	<u>BORON</u>	<u>MOLYBDENUM</u>	<u>SULFATE</u>	<u>IRON</u>	<u>ZINC</u>
S-7873	SEE LOG	1.84	0.12	1,680	0.08	0.08
S-7874	SEE LOG	1.88	0.11	548	1.16	1.50
S-7875	SEE LOG	1.00	0.04	2,770	6.40	0.76
S-7876	SEE LOG	7.64	<0.08	4,760	0.24	0.24
S-7877	SEE LOG	2.04	0.12	334	0.44	0.04
S-7878	SEE LOG	3.16	0.12	4,480	1.48	0.20

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59 1/2 S. MAIN
MOAB, UTAH 84532

Sample ID: **SEE BELOW**

Lab. No. SEE BELOW
 Date Rec. 6/16/83
 Date Sampled -----
 Sampled by YOURSELVES

TABLE 6-14

SODIUM ABSORPTION RATIO

<u>LAB NO.</u>	<u>SAMPLE ID:</u>	<u>MEG/L</u>
S-7873	SEE LOG	142
S-7874	SEE LOG	62.6
S-7875	SEE LOG	35.1
S-7876	SEE LOG	85.5
S-7877	SEE LOG	21.0
S-7878	SEE LOG	53.9

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 59½ S. MAIN
 MOAB, UTAH 84532

 Lab. No. SEE BELOW

 Date Rec. 6/16/83

 Date Sampled -----

 Sample ID SEE BELOW

 Sampled by YOURSELVES
TABLE 6-15

<u>LAB NO.</u>	<u>SAMPLE ID:</u>	<u>% SAND*</u>	<u>% SILT*</u>	<u>% CLAY*</u>
S-7873	SEE LOG	29.0	53.4	17.6
S-7874	SEE LOG	76.0	17.2	6.80
S-7875	SEE LOG	66.8	28.6	4.60
S-7876	SEE LOG	78.0	16.2	5.80
S-7877	SEE LOG	37.8	44.6	17.6
S-7878	SEE LOG	56.4	32.1	11.5

* ANALYSIS PERFORMED BY HYDROMETER METHOD

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CUSTOMER

NEW TECH MINING CORPORATION
 59½ S. MAIN
 MOAB, UTAH 84532

Lab. No. SEE BELOW

Date Rec. 6/16/83

Date Sampled -----

Sampled by YOURSELVES

Sample ID SEE BELOW

TABLE 6-16

<u>LAB NO.</u>	<u>SAMPLE ID:</u>	<u>SODIUM ABSORPTION RATIO*</u>	<u>SATURATED WATER PERCENTAGE**</u>
S-7873	SEE LOG	3.83	38.43
S-7874	SEE LOG	3.93	64.67
S-7875	SEE LOG	0.88	39.10
S-7876	SEE LOG	2.10	55.69
S-7877	SEE LOG	1.74	36.64
S-7878	SEE LOG	2.01	41.98

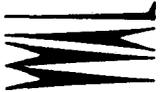
* REVISED 6/30/83

** ADDITIONAL ANALYSIS

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Respectfully submitted

Sham Baker



WAL, Inc.

14335 West 44th Ave. (303) 278-2506 Golden, Colorado 80403

July 9, 1985

Mr. Ray Sim
Standard Laboratories, Inc.
P.O. Box 1140
Huntington, Utah 84528

RE: WAL Batch Number: 8595-162-02

PYRITE FORM AND SIZE DISTRIBUTION

Sample ID: New Tech Mining

(Black Jack Mine#1, Sec.29, T20S, R20E, SLM)

Steven H. Poe
Steven H. Poe
Coal Petrographer

M. L. V. Jacobs
M. L. V. Jacobs, Ph. D.
President
WAL, Inc.

SHP/cgo

Batch Number: 8595-162-02

Sample Number: New Tech Mining
Black Jack Mine #1
Sec.29, T20S, R20E, SLM.

PYRITE FORM AND SIZE DISTRIBUTION

	<u>IRREGULAR *</u>	<u>DISPERSED EUHEDRA</u>	<u>CLUSTERED EUHEDRA</u>	<u>FRACTURE FILLING</u>	<u>BLEBS</u>	<u>FRAMBOIDS</u>	<u>CELL FILLING</u>	<u>DENDRITIC</u>
Area (Microns ²)	112164 μ ²	0	0	0	0	0	20 μ ³	0
Total Area	112184 μ ²							
% of Total Area	99.98	0	0	0	0	0	0.02	0
Occurrence	8	0	0	0	0	0	1	0
Total Occurrences	9							
% of Total Occurrences	88.9	0	0	0	0	0	11.1	0
Volume %	0.9%							

All of the particles counted were pyrite, no marcasite was seen.

Based on 1000 point counts.

* The irregular pieces are either large (area > 1000 μ²) or small (area < 100 μ²) pieces of pyrite which has replaced fusinite, retaining the open "sponge-like" cell structure.

Other analyses can be run to determine the maceral association and degree of concentration of the pyrite.

WAL, Inc.

14335 West 44th Ave. (303) 278-2506 Golden, Colorado 80403

Harvey W. Merrell
Consulting Geologist

P.O. Box 645
Moab, Utah 84532

July 3, 1985

RECEIVED

Phone
(801) 259-8768

JUL 05 1985

Mr. Lynn Kunzler
Utah DOGM
3 Triad Center, Ste. 350
Salt Lake City, Ut. 84180

DIVISION OF OIL
GAS & MINING

Subject: Corrections to
Black Jack-1 Mine
Coal Mine Permit Appl.
New Tech Mining Corp.

Dear Lynn;

I would like to make the following corrections to
the Coal Mine Permit Application:

- 1- Page 3-38
Delete 4th line from bottom of page, that begins
" Linum lewisii... "
- 2- Page 3-39 Mulching
Add after last sentence on the page.
"Hydromulching will use a liquid tactifier at a
rate of 120 pounds/acre in the areas too steep
to crimp the hay mulch."
- 3- Pages 9-30, 9-31, 9-32, 9-33.
Please DELETE THESE FOUR PAGES as the data is
covered in other parts of this permit and these
pages were included as an oversight.

I want to thank you for your help and guidance in
getting this permit application together.

Yours truly,

Harvey W. Merrell

Harvey W. Merrell

cc: B. LeFevre
Empire Eng.