DMEA Form 9
Rev. 6/57

UNITED STATES
DEPARTMENT OF THE INTERIOR
Defense Minerals Exploration Administration

OFFICIAL DOCKET FILE

Idm-E NO. 32

DMEA NO. 269-A

Application
- [ ] Denied
- [ ] Withdrawn

Contract
- [ ] Terminated - Not Certified
- [x] Terminated - Certified
- [ ] Cancelled
- [ ] Royalty Agreement

The records contained in this file are marked (x) and arranged in this order:

Folder No. 1:

Left Side

- [ ] Royalty Audits
- [x] Certification of Discovery
- [ ] Closing Letter
- [x] Cost Audits
- [ ] Termination Notice or Agreement
- [ ] Recision Notice
- [ ] Assignment of Contract
- [x] Contract Amendments
- [x] Contract with all exhibits and annexes
- [ ] Owner's Consent to Lien and Subordination Agreement
- [x] Application and attachments

Right Side

- [x] Project summary (final)
- [x] Work Completed analysis (final)

All other material filed in chronological order including the following reports if checked:

- [ ] Field Team Semi-Annual Report for Certified Project
- [x] Final Field Team Report (Tab)
- [x] Operator's Final Report (Tab)
- [ ] Interim Field Team Reports
- [ ] Operator's monthly reports and all attachments
- [ ] On-site Exam Report (Tab)
- [ ] Settlement Sheets
- [ ] Drill Logs

Additional Folders:

Left Side

Folders No. 2 : Reports

- [x] Analysis of Semi-Annual Inspection Reports
- [ ] Project Summary (Interim) by DMEA Engineers

Right Side

- [x] Field Team Semi-Annual Report for Certified Project
- [x] Field Team Interim Reports
- [x] Operator's Monthly Reports with transmittal, narrative and maps.

Folders No. 4 : Maps (Use pocket folder or envelope)

Folders No. 3 : Settlement Sheets

Folders No. _____ : Drill Logs

Folders No. _____ : Royalty material

17963

Docket Copy

[illegible]

[illegible]

To: [illegible] Company
2012 Corner Drive
Tucson, Arizona

Pursuant to the provisions of Exploration Project Contract No. [illegible], dated June 29, 1951, (Docket No. [illegible]), hereinafter called the "Contract," between [illegible] and the United States of America, hereinafter called the "Government"; to establish and fix the Government's percentage of royalty on production, and its lien thereon, on the mineral deposit which is the subject of the exploration project, the Government considers and determines certain data discovery, or development as reported from the work from which commercial production of ore may be made.

The Government's estimate of said discovery or development is particularized, described and delineated as follows:

Copper minerals, chiefly chalcopyrite, occur in an area of contact metamorphism as replacements in limestone along shear planes and as disseminations in contact silicates. Associated with the deposits are minor amounts of chalcocite, sphalerite, molybdenite and scheelite. Three zones have been explored in the mineralized structures at the [illegible]-foot and [illegible]-foot levels, and [illegible] of ore occurs which occurs on land within the boundaries of the claims described in the contract.

Dated: MAY 29 1953

[illegible]

[illegible]

[illegible]

cc to: Docket
Adm. Reading File
Russell Forbes, DMPA
Field Team, Region II (2)
J. H. Hedges
T. P. Thayer
Mr. Ellis
F. E. Johnson
Operating Committee

Ellis
[illegible]
Robin
Chamberlin
Hedges
Selfridge
Kinkel

S.H.
5-29-53

DEFENSE MINERALS EXPLORATION ADMINISTRATION
CONTRACT ADMINISTRATION AND AUDIT DIVISION

FINAL **AUDIT CERTIFICATE**

I have examined the records and transactions of:

Banner Mining Company
2042 Conner Stravenue
Tucson, Arizona

pertaining to Exploration Contract Idm-E32, Docket No. 269XA including Amendments one to five, covering a project of exploration for copper, for the period August 7, 1951 to March 13, 1953.

My examination was made in accordance with generally accepted standards applicable in the circumstances.

The audit disclosed the following facts in regard to the amount to be paid the Contractor:

Total Cost per MF-104		$128,209.94
Less: Proceeds from Property Disposition		25,550.97
Adjusted Cost		$102.658.97
Exceptions (see Audit Report for) (details):		
During this audit	$403.33	
Prior to this audit	-0-	403.33
Total Accepted Cost		$102,255.64

The contract calls for a 50 per cent participation of exploration expenses by the United States Government. Therefore, payment to the Contractor by the Government in the amount of Fifty-one thousand one hundred twenty-seven and 82/100 Dollars

-$51,127.82-

is valid and proper.

This certificate is issued on the provision that the Regional Executive Officer, the Administrator, or other competent official has accepted or will accept the project as having otherwise met the terms of the contract.

Dated: May 5, 1953

T. H. Brading
T. H. Brading,
Auditor

I. INTRODUCTION

A final audit was made from February 17 to February 19, 1953 (covering the period from August 7, 1951 to March 13, 1953) of the records and accounts of operation pertaining to Contract Idm-E32, Docket No. 269XA, and amendments numbered one to five with the

Banner Mining Company
2042 Conner Stravenue
Tucson, Arizona

covering a project of exploration for copper.

The Cost Accounting, Payroll Records and Daily Log under this contract, are located in the company's office at the mine, about twenty-six miles from Tucson, Arizona. Mr. J. W. Townsend, Mining Engineer, Denver, and Mr. T. M. Romslo, Mining Engineer, Tucson, colloborated in the audit.

During the course of the audit, the following officers and employees of the company were consulted as required:

Mr. W. M. Hardy, Secretary-Treasurer
Mr. A. B. Bowman, General Manager
Mr. W. H. Venable, Engineer-Geologist
Mr. E. C. Bowman, Accountant-Tucson
Mr. Frank Bowman, Accountant-Lordsburg, N. Mex.

Their cooperation and assistance greatly facilitated the audit.

II. GENERAL INFORMATION ON RECORDS

The General Ledger and related records are located in the home office of the company, 550 First National Bank Building, Oklahoma City, Oklahoma. Mr. Hardy brought with him all cancelled checks for the period under review, as well as a transcript of the account with the power company.

The original records covering the costs of this project are recorded on Monthly Cost Analysis Sheets, which form the basis for

preparation of the Monthly MF-104 reports. Therefore, this audit involved in general, a check of original invoices, warehouse requisitions, and payrolls, against the Monthly Cost Analysis Sheets. All items except for incidental freight bills and small items of supplies purchased locally are recorded on an accrual basis.

III. SCOPE OF AUDIT AND FINDINGS

The audit was confined to ascertaining the accuracy, propriety, and validity of the costs as shown in the "Totals to Date" column of Form MF-104, Operator's Monthly Report and Voucher for the month of December, 1952. In view of the previous audit covering the period from August 7, 1951 to September 30, 1952, except as otherwise indicated, this audit was restricted to the costs claimed by the Operator since that latter date. The extent of the audit and the findings under each of the "Items of Cost" follow:

(1) Independent Contracts

Not applicable to this contract.

(2) Labor and Supervision

Labor Balance December 31, 1952	$58,024.75
Balance September 30, 1952	43,290.86
Cost October 1, 1952 to December 31, 1952	$14,733.89

All charges for labor were checked from Payroll Records to the Monthly Cost Sheets. In order to verify the labor time, rates and charges on a test basis, labor costs for the month of November, 1952 were checked from the Monthly Cost Sheets tothe Payroll Records, to the Daily Time Cards approved by the foreman. The audit disclosed that the costs properly allowable and chargeable under the contract were $14,733.89.

Supervision-Balance December 31, 1952	$9505.39
Balance September 30, 1952	7513.52
Costs October 1, 1952 5o December 31, 1952	$ 1991.87

All charges for supervision were traced from Payroll Record to Monthly Cost Sheets. Supervisory costs are broken down as follows:

Allen Bowman, General Superintendent	$665.32
W. H. Venable, Engineer-Geologist	537.03
E. C. Bray, Mine Foreman	789.52
	$1991.87

Supervisory costs for above-named individuals are based on time actually devoted to the project. Rates are based on those shown in contract and amendments. The audit disclosed that the amount properly allowable and chargeable under the terms of the contract for the period under review to be $1991.87.

(3) Operating Materials and Supplies

All charges under subject category were checked to Monthly Cost Sheets. An analysis was made to determine propriety of the items charged. Purchases for the period under review were verified by examination of vendors' invoices, payment of invoices were test-checked against cancelled checks. Costs as recorded on invoices were test-checked to stock records. Requisitions for the month of December were checked against stock records. It was determined that supplies and materials from company warehouse were charged to the project at cost.

The costs properly chargeable and allowable under this classification were found to be as follows:

Description	Balance 12/31/52	Adjusted Balance 9/30/52	Cost 9-12/52
Timber	$4,975.69	$3851.44	$1124.25
Explosives	89.65	72.03	17.62
Pipe	3,400.67	3207.52	193.15
Track	3,219.90	2524.67	695.23
Other	4,312.20 *	3651.71	660.49

*Other - consists of the following:

Steel & Bits	940.24
Electrical Supplies	1821.69
Oil & Grease	393.34
Hand Tools	643.76
Air Hose	119.88
Miscellaneous	393.29
	$4312.20

Power

Electric power is purchased from Trico Electric Company, Tucson, Arizona. When the power lines were extended to the company property from the main power lines of the Trico Electric Company, the Operator was required to make a deposit of $9,700.00. Each month a deduction of 20% is made from the amount of the power bill and this amount credited to the deposit. The Operator had followed the procedure of charging the net amount of the power bill as cost to the project. In order to show the true costs of power to the program, an analysis of charges to power was made as follows:

Power Costs to September 30, 1952	$3,774.47
Discount to September 30, 1952	917.77
Revised Power Costs to Sept.30, 1952	$4,692.24
Power Costs to December 31, 1952	$5,316.35
Discount to Dec. 31, 1952	1,299.07
Revised Power Costs to Dec. 31, 1952	$6,615.42
Revised Power Costs to Dec. 31, 1952	$6,615.42
Revised Power Costs to Sept. 30, 1952	4,692.24
Revised Power Costs 10/1 to 12/31/52	$1,923.18

Invoices together with related cancelled checks were examined, and balance in General Ledger as reflected by the transcript of the Trico Power Company account, which Mr. Hardy had brought with him. The revised costs of $1,923.18 are considered as proper and allowable under the terms of the contract.

(4) Operating Equipment-Purchases

Balance December, 1952	$2165.25
Balance September 30, 1952	2165.25
Oct. 1 to Dec.31, 1952	-0-

Operating Equipment-Depreciation

With the exception of a Diamond T Truck, the Operator did not keep a record of the time company-owned equipment was used, on which depreciation was allowed. It was considered that the equipment in question was used for the full three months, as the project was in operation practically full time for the period under review.

All charges for depreciation were checked against monthly cost sheets. Time charged for the use of the Diamond T Truck was traced to Daily Log. The charges for depreciation summarized below are considered proper and allowable under the terms of the contract.

	Rate	Time Used	Total Charge
Hoist	41.66 mo.	3 months	124.98
2 IR Pumps	41.66 mo.	3 months	124.98
1-15 HP Saw	5.83 mo.	3 months	17.49
1-686 CFM Gardner Denver Compressor	131.16 mo.	3 months	393.48
Mine Cars	10.00 mo.	3 months	30.00
			690.93
Diamond T Truck	2.00 hr.	4 hours	8.00
Total			698.93
December 31, 1952 Balance			2162.29
September 30, 1952 Balance			1463.36
Costs - Oct. 1, 1952 to Dec. 31, 1952			698.93

(5) Initial Rehabilitation and Repairs

Balance December 31, 1952	$4,001.12
Balance September 30, 1952	4,001.12
Oct. 1, 1952 to Dec. 31, 1952	-0-

(6) New Buildings and Improvements

Balance December 31, 1952	$17,647.26
Balance September 30, 1952	18,946.33
Decrease Oct. 1 to Dec. 31, 1952	($ 1,299.07) Minus

Accounted for as follows - Discount on electric power bills - $1,299.07--credited to Power Deposit. (See reference under "Power" in prior paragraphs).

(7) Miscellaneous

Repairs to Equipment

Balance December 31, 1952	$1493.19
Revised Balance Sept. 30, 1952	1122.17
Repair Costs Oct. 1 to Dec. 31, 1952	$ 371.02

Analysis of charges to this account are shown below:

	Balance December 31,1952	Adjusted Balance Sept.30, 1952	Cost 10/1 to 12/31/52
Pumps	$1248.08	$888.73	$359.35
Hoists and Motor	106.25	94.58	11.67
Drill & Mucking Machine	96.65	96.65	
Calculator	4.77	4.77	
Skill Saw	37.44	37.44	
	$1493.19	$1122.17	$371.02

Invoices and warehouse requisitions covering charges were examined as to propriety and costs.

Charges for sampling and analysis were examined and traced to monthly cost sheets. For the period under review these charges were as follows:

279 Copper Assays	at	$1.25	$348.75
13 Tungsten "	at	$4.00	52.00
9 Molybdenum "	at	$4.00	36.00
1 Composition "	at	$1.50	1.50
			$438.25

Balance December 31, 1952	$681.00
Balance September 30, 1952	242.75
Costs 10/1 to 12/31/52	$438.25

Payroll Taxes and Compensation Insurance

All charges for Payroll Taxes and Compensation Insurance were checked by computation at the rates shown to be in effect in the company's files. These rates were:

Social Security Tax		1.5
Unemployment		
Federal	.3	
State of Ariz.	1.7	2.0
		3.5
Workmen's Compensation Insurance		8.77
Workmen's Compensation Insurance - E. C. Bowman, Accountant		4.42

Workmen's Compensation Insurance Balance 12/31/52	$6595.06
Workmen's Compensation Insurance Balance 9/30/52	5049.44
Workmen's Compensation Insurance charged 10/1 to 12/31/52	$1545.62

Labor charge 10/1/52 to 12/31/52	$14733.89
Supervision charge 10/1/52 to 12/31/52	1991.57
Total	$16725.46

Allowable charge - $16725.46 x 8.77 =	$ 1466.85	
Accountant's Salary-10/1/52 to 12/31/52 =	8.93	
Total allowable charge		1475.78
Overcharge Disallowed		$ 69.84

Contingencies

Transportation - Balance December 31, 1952	$ 333.49
Transportation - Balance September 30, 1952	862.02
Difference	$ 528.53

This difference is accounted for as follows:

Transferred to Supplies - Other, as the charges made covered transportation of supplies. Item of $333.49 was for freight on Gardener Denver Compressor which is company-owned, and therefore, is disallowed as a charge to the operation.

Accountant's Salary

Balance December 31, 1952	$762.60
Balance Sept. 30, 1952 - Adjusted	565.11
Oct. 1, 1952 to Dec. 31, 1952	$197.49

Amendment No. 5 authorizes the employment of a bookkeeper at $65.83 per month.

IV. CONCLUSIONS AND RECOMMENDATIONS

The totals shown on MF-104A are in agreement with those shown on MF-104.

The audit has disclosed that all costs as charged to this project, with the exception of disallowances itemized under item (7) Miscellaneous, and item (8) Contingencies, and giving effect to liquidation settlement, are fitting and proper under the terms of the contract and amendments one to five.

The amounts shown on the December MF-104, the recommended disallowances, and approved amounts, are summarized as follows:

	Totals MF-104 12/31/52	Disal-lowed by audit	Liquidation Settlement	Allowed by Audit
(2) Labor & Supervision				
Labor	$58024.75			$58024.75
Supervision	9505.39			9505.39
(3) Operating Material & Supplies				
Timber	4975.69			4975.69
Explosives	89.65			89.65
Pipe	3400.67		595.00	2805.67
Track	3219.90		696.11	2523.79
Other Supplies	4312.20		446.23	3865.97
Power	6615.42			6615.42
(4) Operating Equipment				
Rental	-			-
Purchase	2165.25		2165.25	
Depreciation	2162.29			2162.29
(5) Initial Rehab. & Repairs	4001.12		4001.12	
(6) New Bldgs., Improvements, etc.	17647.26		17647.26	
(7) Miscellaneous				
Repairs to Equip.	1493.19			1493.19
Sampling & Anal.	681.00			681.00
Payroll Taxes	2225.01			2225.01
Liability Insurance	6595.06	$ 69.84		6525.22
(8) Contingencies				
Transportation	333.49	333.49		
Accountant's Salary	762.60			762.60
	$128209.94	$403.33	$25550.97	$102255.64

At the conclusion of the audit, the findings were discussed with the treasurer, W. H. Hardy, the General Manager, Allen Bowman, and the accountant, E. C. Bowman.

As the project has been completed, settlement of Government equity, for which the Operator has forwarded his check was made on the following basis:

Article	Inventory Value 12/31/52	Basis of Settlement	Amount
Operating Equipment-Purchased	$2165.25	100% of Inventory Value	$2165.25
Rehabilitation Repairs	4001.12	100% of Inventory Value	4001.12
New Buildings, Improve., etc.	17647.26	100% of Inventory Value	17647.26
Electrical Supplies, Equipment and Accessories	856.03	35% of Inventory Value	299.61
Tools and Small Equipment	237.61	30% of Inventory Value	71.28
Hose, Air and Water	119.88	35% of Inventory Value	41.96
Pipe	2671.64	5% above net salvage value	449.19*
Pipe Fittings	729.03	20% of Inventory Value	145.81
Track	2776.55	5% above salvage value	585.27**
Track Accessories	443.35	25% of Inventory Value	110.84
Drill Steel and Bits	133.51	25% of Inventory Value	33.38
			$25550.97
		Government Interest - 50%	12775.49
		Check Received	$12775.49

*Pipe - Estimated Net Salvage Value

14.26 tons at $65.00 per ton	$926.90
Estimated Salvage Costs	499.10
Estimated Salvage Value (High Bid)	$427.80
Settlement 5% above salvage value	$449.19

**Track - Estimated Net Salvage Value

18.58 tons at $65.00 per ton	$1207.70
Estimated Salvage Costs	650.30
Estimated Salvage Value (High Bid)	$ 557.40
Settlement 5% above Salvage Value	$ 585.27

The Operator had obtained two bids on supplies-equipment, copies of which are attached; one from Paul F. Smith, Phoenix, Arizona, and the other from Bob Barrett, Tucson, Arizona. In view of the fact the bid made by the Operator was more favorable than either of the other two bids, the Executive Officer of Region IV accepted his bid.

There were no unused materials, supplies, or other property to be disposed of for the joint account of the Operator and the Government, other than that covered in the preceding paragraph.

May 5, 1953

T. H. Brading

T. H. Brading, Auditor

Business Phone 2-8311 Home Phone 4-0264

BOB BARRETT

USED MINING AND INDUSTRIAL EQUIPMENT BOUGHT AND SOLD
APPRAISERS AND LIQUIDATORS
SHOP AND YARD 2210 SOUTH FREEWAY
P. O. BOX 2804 TUCSON, ARIZONA

February 19,1953

Banner Mining Company
2042 Connor Stravenue
Tucson, Arizona

Attention Mr. Alan Bowman

Dear Mr. Bowman:

According to the list of pipe and rail submitted to us for Bid, we find a total of 28520# of Pipe in assorted sizes and a total of 37160# of rail in various sizes.

For the 28520# of Pipe we would offer $65.00 per ton f.o.b. collar of shaft at Mineral Hill. For the 37160# of rail we would offer $65.00 per ton f.o.b. collar of shaft at Mineral Hill. The weight based on net tons of 2000# each.

For the following materials and supplies, we would offer as follows:

Tools and small equipment 25% of your original cost.
Electrical fittings and supplies at 25% of your original cost.
Air and water hose at 30% of your original cost.
Pipe fittings and accessories at 15% of your original cost.
Mine track accessories at 20% of your original cost.
Drill steel and detachable bits at 10% of your original cost.

Hoping you find our bid of interest,

I remain,

Signed

Bob Barrett

Certified True Copy

Banner Mining Company

/s/ A. B. Bowman
General Manager

C O P Y

PAUL F. SMITH ********** MACHINERY **********

39 West Adams Street
Phoenix, Arizona

February 20, 1953

Banner Mining Company
Mr. Alan Bowman
2042 Conner Stravenue
Tucson, Arizona

Dear Mr. Bowman:

With reference to your surplus pipe and rail, etc., we estimate that there is around 32 tons of the pipe and rail; and for these two items we offer $62.00 a ton of 2,000 pounds- the rail and pipe to be piled on top of the ground, ready for loading on truck.

As regards the miscellaneous items, we offer you:

Detachable bits and drill steel - 10% of your cost, new from the factory.
Track accessories and pipe fittings and accessories - 15% ditto.
Small equipment and tools, electrical supplies and fittings, and air and water hose - 25%, of your cost new from the factory.

We hope to have the pleasure of hearing favorably from you, and we are,

Yours very truly,

Signed

Paul F. Smith

CERTIFIED TRUE COPY

BANNER MINING COMPANY

/s/ A. B. Bowman
General Manager

C O P Y

224 New Customhouse
Denver 2, Colorado

March 13, 1953

Banner Mining Company
2042 Conner Stravenue
Tuzson, Arizona

Attention: Mr. A. B. Bowman, Superintendent,
Arizona Operations

Reference: Docket DMA 269X-A, Contract I-DMA-E32

Gentlemen:

Consistent with the authority delegated to this office under Order No. 2684 from the Office of the Secretary, Department of the Interior, we hereby accept your bid dated March 2, 1953, in the amount of $12,775.49 in settlement of the Government's interest in property and the unexpended portion of supplies and materials which were purchased under the terms of Contract I-DMA-E32.

Upon receipt of your check in the amount of $12,775.49 and your final engineering and geologic report, in compliance with the applicable provisions of articles "7" and "13" of Exploration Project Contract Form MF-200, your final Form MF-104 Report and Voucher for the month of December 1952 will be processed for reimbursement to you.

Very truly yours,

/s/ W. H. King
Executive Officer, DMEA
Field Team, Region IV

C O P Y

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
DEC 1952

DEFENSE MINERALS EXPLORATION ADMINISTRATION
CONTRACT ADMINISTRATION AND AUDIT DIVISION

AUDIT CERTIFICATE

I have examined the records and transactions of

Banner Mining Company

Tucson, Arizona

pertaining to Exploration Project, Contract No. IDM-E32, Docket No. 269X-A, for the period of August 7, 1951 to September 30, 1952.

My examination was made in accordance with generally accepted standards applicable in the circumstances.

The Audit disclosed the following facts in regard to the amount to be paid the contractor:

Total Cost as Billed by Contractor		$106,357.28
Exceptions (per Audit Report)	$2654.46	
Prior Exceptions	217.25	2,871.71
Total Accepted Cost		$103,485.57

The contract calls for a 50 per cent participation of exploration expenses by the United States Government. Therefore, payment to the contractor by the Government in the amount of Fifty one thousand seven hundred forty-two and 78/100

- $51,742.78 -

is valid and proper.

This certificate is issued on the provision that the Regional Executive Officer, the Administrator, or other competent official has accepted or will accept the project as having otherwise met the terms of the contract.

T. H. Brading, Auditor

I. INTRODUCTION

An interim audit was made from November 3 to November 7, 1952 (covering the period from August 7, 1951 to September 30, 1952) of the records and accounts of operation pertaining to IDM-E32, Docket No. 269X-A, with amendments by the Executive Officer of Region IV, Nos. 1 & 2 dated November 20, 1951 and subsequent amendments dated February 16, 1952, April 11, 1952 and August 5, 1952. An interim audit was made simultaneously covering the above-mentioned period, of the records and accounts of operation pertaining to IDM-E33, Docket No. 269X-B, with amendments by the Executive Officer of Region IV, Nos. 1 & 2 dated November 20, 1952 and subsequent amendments dated February 16, 1952, April 11, 1952, August 5, 1952 and September 26, 1952 with the

Banner Mining Company
Tucson, Arizona

covering a project of exploration for copper.

The Cost Accounting, Payroll Records and Daily Log under these contracts are located in the company's office at the mine site which is located on an unnumbered road approximately 26 miles from Tucson.

During the course of the audit, the following officers and employees of the company were consulted as required:

Mr. W. H. Hardy, Secretary and Treasurer
Mr. W. H. Venable, Engineer & Geologist
Mr. E. E. Bray, Mine Foreman
Mr. E. C. Bowman, Accountant-Tucson
Mr. Frank Bowman, Accountant-Lordsburg, N.M.

Mr. Frank Bowman brought original invoices and cancelled checks covering equipment and material purchased by Banner Mining Company, Lordsburg, New Mexico, and later charged to Tucson operations. Full cooperation and assistance were extended by all concerned.

Mr. T. M. Romsolo, and Mr. L. L. Farnham, Mining Engineers, Tucson Office, collaborated in this audit.

II. GENERAL INFORMATION ON RECORDS

The general ledger and related records are located in the home office of the company, 550 First National Bank Building, Oklahoma City, Oklahoma. At my request, Mr. W. H. Hardy, Secretary and Treasurer of the Contractor, made available for examination at Tucson, all vouchers and cancelled checks covering the purchases of Equipment and Supplies, as well as cancelled checks for payrolls for the months of December, 1951, March and June, 1952.

The original records covering the costs of this project are recorded on Monthly Cost Analyses Sheets, which form the basis for preparation of the Monthly MF-104 reports. Therefore, this audit involved in general, a check of original invoices and payrolls against the Monthly Cost Analyses Sheets. All costs, except for incidental freight bills and small items for supplies purchased locally, are recorded on an accrual basis.

III. SCOPE OF AUDIT AND FINDINGS

The audit was limited to ascertaining the accuracy, propriety and validity of the costs as shown in the "Totals to Date" column of Form MF-104, Operator's Monthly Report and Vouchers for the month of September, 1952. The extent of the audit and the findings under each of the "Items of Cost" follow:

(1) Independent Contracts

Not applicable to these contracts

(2) Labor and Supervision

All charges under this item were checked against the amounts recorded on the "Monthly Cost Analysis." In order to verify charges for labor as recorded on the MF-104, a test check was made which embraced the months of December, 1951--March and June, 1952. Individual time tickets approved by the foreman for these months were checked to Payroll Record, all rates checked to contract, calculations and extensions checked, and totals traced to Monthly Cost Analyses Sheets. Cancelled checks for net amount were checked to payroll record and endorsements scrutinized. Charges for supervisory personnel were checked to Daily Log which noted time spent on project by supervisory personnel. The audit disclosed that the costs shown under this item on September MF-104 (on Contract E32) as compared to the costs properly chargeable, and allowable under the terms of the contract to be:

	Charged	Not Allowable	Allowable
Labor	$44,633.58	$1,342.72 1/	$43,290.86
Supervision:			
A. B. Bowman, Gen. Mgr.	3,791.91	99.79 1/	3,692.12
E. E. Bray, Mine Foreman	2,812.82	74.03 1/	2,738.79
W. H. Venable, Engineer & Geologist	1,111.87	29.26 1/	1,082.61
Totals	$ 7,716.60	$203.08	$ 7,513.52

1/ Installing 686 CFM Compressor -- Not allowable under contract.

The audit disclosed that the following costs as shown under this item on September MF-104 (on contract E33) with the exception of $1.68 disallowed by Finance Officer to be properly chargeable and allowable under the terms of the contract:

Labor	$32,740.38
Supervision:	
A. B. Bowman, Gen. Supt.	3,648.92
E. E. Bray, Mine Foreman	2,746.10
W. H. Venable, Engineer	963.20
Total	$7,358.22

(3) Operating Material and Supplies

All charges in subject category were checked against Monthly Cost Sheets. File copies of purchase invoices were scrutinized to determine propriety of the items charged. Test check of purchases for September, 1951-December, 1951-June and August, 1952 were checked to company's perpetual inventory record to verify costs. This check verified the fact that material and supplies are carried in the inventory at cost, plus sales tax. Test check of Daily Requisitions for supplies and materials issued was made against inventory records and traced to Monthly Cost Sheet to verify cost of materials and supplies charged to project.

The company purchases explosives in car load lots to obtain advantage of lower prices. Wherever possible, the same pro-

cedure as followed in purchasing explosives, is also followed in purchasing materials and supplies. On Contract E32, the following disallowance is made on subject account:

Supplies-Other	$503.40
Pipe	281.05
	$784.45

Charged to Installation of 686 CFM Compressor-not allowed in the contract.

The total costs properly chargeable and allowable under this item were found to consist of the following under contract E32:

	Charged	Disallowed	Allowable
Timber	$3851.44		$3851.44
Explosives	72.03		72.03
Pipe	1942.38	$281.05	1661.33
Track	1774.85		1774.85
Other	6828.24	503.40	6324.84
	$14,468.94	$ 784.45	$13,684.49

On Contract E33, the total costs properly chargeable and allowable under this item were found to consist of the following:

Timber	$2024.71
Explosives	385.16
Pipe	2672.86
Track	2053.80
Other	4010.72
Total	$11,147.25

Power

The following items of power costs represent charge for electric current purchased from Trico Electric Company, Tucson, Arizona. A deduction of 20% is made from each invoice to apply on the deposit made, which is covered elsewhere in this report. Charges to the project are on a net basis, and are properly chargeable and allowable under the contract as follows:

IDM-E32	$3774.47
IDM-E33	2907.38

(4) Operating Equipment

Purchases of Operating Equipment were checked and found to be proper and allowable under the contracts as follows:

Contract E32

1 - 300 AMP Arc Welder and Accessories	$592.10
1 - 1200' 3/4" Hoist Cable for Incline Shaft	374.40
1 - Electric Saw for Framing	165.00
1 - Royal Typewriter	135.00
1 - Marchant Calculator	745.20
1 - Chain Hoist for Shop	153.55
Total	$2,165.25

Contract E33

1100' 3/4" Hoist Cable for Glance Shaft	$316.80
2 - Ingersoll Rand-50 HP Motor Pumps	2217.90
1 - Gardner-Denver 3"-3½" Drifter Drill and Accessories	1031.33
1 - Eimco 12B Mucking Machine with Accessories	3095.00
5 - Used Mine Cars - $35.00 each	175.00
	$6,836.03

Equipment-Depreciation

Charges for depreciation of operating equipment were checked against the Monthly Cost Sheets. Time for use of Diamond T truck was checked to daily log. Rates were in accordance with those specified in the contract and amendments. On Contract E32, $21.16 depreciation was charged to the installation of 686 CFM compressor. As this is not covered in the contract, the amount is disallowed. The other charges as itemized below, are proper and reasonable and allowable under the terms of the contract and amendments, with the additional exception of $151.00 disallowed by Finance Officer because contract did not cover this item at that time.

	Rate	Time Used	Total Charged	Dis-Allowed	Allowed by Audit
Hoist	$41.66 per mo.	12 2/3mo.	$465.03*	$ 21.16	$443.87
50 HP Pump	41.66 "	7 mo.	291.62		291.62
Mine Cars	1.25 "	various	38.75		38.75
Saw	5.83 "	7 mo.	40.81		40.81
Concrete Mixer	4.16 "	9 mo.	36.67 *		36.67
Compressor	131.61 "	4 mo.	524.64		524.64
Diamond T. Truck	2.00 per hr.	119 hrs.	238.00	151.00	87.00
	Total		$1635.52	$172.16	$1463.36

* Portion allocated to Rehabilitation and Repairs

On Contract E 33, the following charges which with the exception of $8.32 disallowed, because equipment was not listed in the contract, and $6.00 truck rental disallowed by Finance Officer, are reasonable and allowable under the terms of the contract.

	Rate	Time Used	Total Charged	Dis-Allowed	Allowed by Audit
Hoist	$41.66 per mo.	11 mos.	$458.26		$458.26
Pick-Up Truck	41.66 per mo.	11 mos.	458.26		458.26
Compressor	225.00 " "	10 "	2250.00		2250.00
Cement Mixer	4.16 " "	2 "	8.32	$8.32	-----
Diamond T. Truck	2.00 " "	167.5 hrs	335.00	6.00	329.00
	Total		$3509.84	$14.32	$3495.52

(5) Initial Rehabilitation and Repairs

The original contracts were not too specific as to items to be charged under subject heading. The subject was reviewed at length with the engineers who collaborated in the audit, and as a result, the following charges which are considered properly chargeable and allowable were set up:

Contract E32

Labor	$1048.91
Supervision	563.66
Lumber	657.07
Equipment Rental	67.68
Supplies	1446.82
Compensation Insurance	161.25
Payroll Taxes	55.73
	$4001.12

* Part month proration.

The following charges were established as being reasonable and proper under the terms of the contract:

Labor	$1914.48
Supervision	1161.53
Equipment Rental	106.74
Repairs	99.72
Timber	111.34
Other Supplies	1545.16
Compensation Insurance	308.44
Payroll Taxes	106.86
	$5354.27

New Buildings and Improvements

As with rehabilitation and repairs, the contract is not too specific regarding certain items under the subject classification. The following items were established after a discussion with the engineers, as being properly chargeable and allowable:

Labor	$2738.36
Supervision	1404.63
Equipment Rental	68.09
Timber	1836.55
Prefab. Butler Bldg. & additional siding	2176.78
Supplies	463.10
Compensation Insurance	414.30
Payroll Taxes	144.52
Power Deposit	9700.00
	$18946.33

Under Contract E33, the deposit of $1765.00 with the Trico Electric Company, Tucson, Arizona, is shown as New Buildings and Improvements. It is considered to be proper and chargeable. This deposit and the deposit of $9700.00 on Contract E32, were made by the Contractor to induce the Power Company to build a transmission line to the mine.

At the time of the final audit these deposit amounts should be adjusted to reflect the unrecovered balance, which will

then be subject to liquidation apportionment.

Miscellaneous

Repairs to Equipment

	E32	E33
Pump Repairs	$218.40	$289.83
Compressor & Motor Repairs		644.99
Skill Saw	14.10	
Mucking Machine	34.25	
	$266.75	$934.82

Above charges were verified by tracing charges to Monthly Cost Sheets and spot check of invoices and cancelled checks.

Sampling and Analysis

		E32		E33
(1)	73 Assays at $2.50	$182.50	56 Assays at 2.50	$140.00
(2)	10 " " 4.00	40.00	2 " " 4.00	8.00
	13 Zinc	20.25		
		$242.75		$148.00

(1) - Copper & Silver (2) - Molybdenum

All charges were verified by tracing charges to Monthly Cost Sheets and spot check of invoices and cancelled checks.

Transportation

E32	E33
$862.02	$846.96

Above items were verified by tracing charges to Monthly Cost Sheets. Spot check of invoices from recognized common carriers together with related cancelled checks was also made.

Compensation Insurance and Payroll Taxes

All charges for payroll taxes and insurance were checked by computation at the rates shown by the company's files to be in effect. These rates were as follows:

F.I.C.A.	1.5%	
Unemployment:		
Federal	.3%	
State	1.7%	3.5%
Workmen's Compensation		10.0%

Since disallowances were made for salaries and wages under these contracts, the allowable costs for payroll taxes and insurance must be disallowed as follows:

Disallowance of Accountant's Salary for month of September, 1951, made by Finance Officer	$66.25

No disallowance was made for F.I.C.A. which should be $.99 on each project or total of $1.98, and $1.33 for unemployment insurance on each contract or a total of $2.66

On Contract E32, disallowance of supervisory salaries in the amount of $203.08 was made. This results in a disallowance on the following:

F.I.C.A.	1.5% of $203.08	$3.05
Unemployment	2.0% of $203.08	$4.06
	Total	$7.11

Compensation Insurance - 10% of $203.08 $20.31

Examination of payroll records disclosed that the wages of the following officers and men had reached the statutory requirements, but the fact was overlooked in charging F.I.C.A. and Unemployment Insurance to the two projects from January 1, 1952 to September 30, 1952.

Name	Earned	Deducted	Correct	Overcharge
A. B. Bowman	$6438.21	$96.57	$54.00	$42.57
E. E. Bray	4555.98	68.34	54.00	14.34
Juan Martinez	3916.66	58.75	54.00	4.75
Mike Ybarra	3880.00	58.20	54.00	4.20
Jesus Felix	4170.00	62.55	54.00	8.55
Mike Coronado	3716.00	55.74	54.00	1.74
		$400.15	$324.00	$ 76.15

Chargeable to Project as follows:

	E32	E33	
	$ 31.28	$ 44.87	$76.15

Unemployment Insurance, - 2% deducted

Name	Earned	Deducted	Correct	Overcharge
A. B. Bowman	$6438.21	$128.76	$90.00	$38.76
E. E. Bray	4555.98	91.12	90.00	1.12
		$219.88	$180.00	$39.88

While the company charged Unemployment Compensation at 2.0%, they were legally entitled to make the following charges:

Federal	.3%	
State	2.7%	3.0%

Accordingly, disallowance is based on the amount that could be deducted, and is divided between the projects on a 50% basis or $19.94 to each project.

Disallowances of $55.30 for Payroll Taxes and $151.51 for Compensation Insurance were made on Contract E32--Installation of compressor not authorized by contract.

Analysis of disallowances is shown herewith:

	Contract E32			Contract E33		
	Charged	Disallowed	Allowable	Charged	Disallowed	Allowable
Payroll Tax	$1841.88	$115.95	$1725.93	$1417.69	$67.13	$1350.56
Emp. Comp.Ins.	5221.26	171.82	5049.44	4016.66		4016.66

Accountant's Salary

On the September MF-104's, Accountant's Salary is included in Supervision. After correction was made, the charges are as follows:

E32			E33		
Total Charged	Disallowed	Allowed	Total Charged	Disallowed	Allowed
$580.81	$81.53	$499.28	$659.44	$66.25	$593.19

Disallowed by Audit on E32	$15.28
Disallowed by Finance Officer	66.25 on each contract
Total E32	$81.53

Pro-rated part of Accountant's Salary charged to Installation of Compressor, disallowed because it was not covered in the contract or amendments. The amounts shown as allowed are reasonable and proper under the terms of the contract and amendments.

IV. CONCLUSION AND RECOMMENDATIONS

The audit has disclosed that all costs as charged to these projects, with the exception of the disallowances which are itemized in Schedule "1" are reasonable and proper under the terms of the contracts and amendments. The adjustments between items of costs as shown on the September MF-104's, the recommended disallowances, and approved amounts, are summarized as follows:

E32

	Totals September MF-104	Distri-bution Corrected	Disallow-ed Schedule 1	Total Allowed
(2) Labor, Super-vision				
Labor	$47005.06	$44633.58	$1342.72	$43290.86
Supervision	7168.06	7716.60	203.08	7513.52
(3) Operating Mater-ial & Supplies				
Timber	4196.24	3851.44		3851.44
Explosives	72.03	72.03		72.03
Pipe	353.12	1942.38	281.05	1661.33
Track	752.98	1774.85		1774.85
Other Supplies	10862.78	6828.24	503.40	6324.84
Power	13474.47	3774.47		3774.47
(4) Operating Equipment				
Purchase	2165.25	2165.25		2165.25
Depreciation	1696.52	1635.52	172.16	1463.36
(5) Initial Rehab. & Repairs	762.81	4001.12		4001.12
(6) New Bldgs-Imp. Etc.	9246.33	18946.33		18946.33
(7) Miscellaneous				
Rep. to Equip.	266.75	266.75		266.75
Samp.& Anal.	242.75	242.75		242.75
Payroll Taxes	1884.64	1841.88	115.95	1725.93
Liability Ins	5345.47	5221.26	171.82	5049.44
Transportation	862.02	862.02		862.02
Accountant		580.81	81.53	499.28
	$106,357.28	$106,357.28	$2871.71	$103,485.57

E33

(2) Labor, Super-vision				
Labor	$34238.64	$32742.06	1.68	$32740.38
Supervision	7434.41	7358.22		7358.22
(3) Operating Mater-ial & Supplies				
Timber	2072.17	2024.71		2024.71
Explosives	385.16	385.16		385.16
Pipe	395.19	2672.86		2672.86
Track	497.19	2053.80		2053.80
Other Supp.	8058.65	4010.72		4010.72
Power	4672.38	2907.38		2907.38
(4) Oper. Equip.				
Purchases	6836.03	6836.03		6836.03
Depreciation	3525.84	3509.84	14.32	3495.52
(5) Init. Rehab. & Repairs	3638.46	5354.27		5354.27
(6) New Bldg & Imp	---	1765.00		1765.00
(7) Miscellaneous				
Rep. to Equip.	934.82	934.82		934.82
Samp.& Anal.	148.00	148.00		148.00

E33 (con't)

	Totals September MF-104	Distri-bution Corrected	Disallow-ed Schedule 1	Total Allowed
Payroll Taxes	$ 1449.65	$ 1417.69	$67.13	$1350.56
Liability Ins.	4108.00	4016.66		4016.66
Pick-Up Gas & Repairs	402.07			
Transportation	846.96	846.96		846.96
Accounting		659.44	66.25	593.19
	$79643.62	$79643.62	$149.38	$79494.24

At the conclusion of the audit, the findings were discussed with the accountant, Mr. E. C. Bowman. The company is preparing their next Monthly MF-104 on the basis of the proper distribution of charged costs as shown in the second column of the foregoing summaries.

T. H. Brading, Auditor

November 17, 1952

BANNER MINING COMPANY

SCHEDULE "1"

Items Disallowed

By Audit	Contract E32	Contract E33
Labor	$1342.72	
Supervision	203.08	
Equip. Rental	21.16	$ 8.32
Other Supplies	503.40	
Pipe	281.05	
Comp. Ins.	171.82	
Payroll Tax	115.95	67.13
Accountant	15.28	
	$2654.46	$ 75.45

By Finance Officer		
Accountant	66.25	66.25
Truck Rental	151.00	6.00
Payroll Error		1.68
	$ 217.25	$ 73.93
Total Disallowances	$2871.71	$ 149.38

No. 5

AMENDMENT OF CONTRACT: No. I-DMA-232

Contract Docket No. DMA 269-X-A, dated June 29, 1951, between the United States of America and Banner Mining Company is hereby amended as follows, effective September 1, 1952:

Referring to "Exhibit D" attached to Exploration Project Contract Form MF-200, delete the two paragraphs following the reference "+Note-" which refer to the extent of time to be spent on the project by the "Superintendent," Foreman" and "Engineer."

Referring to the Amendment dated November 20, 1951, which amended Exhibit "D" attached to Exploration Project Contract Form MF-200, delete items "2." and "3." and all matter following thereafter and pertaining thereto.

Referring to Amendment No. 2, dated 2-16, 1952, which amended "Exhibit D" attached to Exploration Project Contract Form MF-200, under the statement "Add,in lieu of matter deleted, the following:" delete the following:

+1-Superintendent	at	$381.00 per month
+1-Foreman	at	275.00 per month
+1-Engineer	at	120.00 per month

In lieu of deleted matter substitute the following:

+1-Superintendent	at	$381.00 per month
+1-Foreman	at	275.00 per month
+1-Engineer	at	240.00 per month
1-Bookkeeper	at	65.83 per month

+ - The above figures pertaining to the Superintendent, Foreman and Engineer reflect one-half of their monthly salary rates as only one-half of their time will be spent on the said contract work.

Referring to Exploration Project Contract Form MF-200, article "3. Exploration Project," following the words "all property designed to bring the project to completion within a period of," delete "12 months" and in lieu thereof substitute "24 months."

This amendment shall not be construed to increase the estimated total cost of the project, the aggregate total amount which the Government may pay or the percentage of the costs which the Government may pay under the provisions of Article 11 of the contract form.

Dated September 26, 1952

BANNER MINING COMPANY

By E. S. Bowman
President

ATTEST

W. H. Handy
Secretary

UNITED STATES OF AMERICA

By W. H. King
Executive Officer-DMEA

MINING DIVISION
REGION IV

August 28, 1952

Memorandum

To : W. H. King, Acting Chief, Mining Div., Region IV

From : Chief, Arizona-New Mexico Br., Mining Div., Region IV

Subject : Amendment to Contract I-DMA-E32, Docket DMA-269XA, Danner Mining Co's. Mineral Hill Copper Mine, Pima County, Ariz.

Attached are original and five copies of a request from the above company to amend contract I-DMA-E32, so one-half of the engineer's time, or $240, may be charged to this project. As shown on page 12, Exhibit D, Supervision and Engineering, only one-fourth of the engineer's salary now is being charged to this contract. However, because of increased work the engineer now seems to be spending all of his time in Arizona on Contracts I-DMA-E32 and E33.

This same letter from the company also requests that the time limit for completion of this contract be changed from 12 to 24 months, or from June 29, 1952 to June 29, 1953. The work has not been completed at this project and a substantial amount of money still remains from the original allotment.

As these requests are fair and just, and are to the advantage of the Government as well as the company, I recommend that an amendment be made increasing the engineer's time to one-half or $240 per month, and time of project completion to June 29, 1953 unless all funds have been expanded before that date.

Walter R. Storms.

Walter R. Storms, Chief
Arizona-New Mexico Branch
Mining Division, Region IV

CC W. H. King (5)
DMA-269XA
DF

WRStorms:frj

LARGE FORMAT DOCUMENTS AT END OF FILE

August 27, 1952

Mr. W. H. Storms, Chief
Arizona-New Mexico Branch,
Mining Division,- Region IV
P. O. Box 4097 University Station
Tucson, Arizona.

Dear Mr. Storms:-

I am writing with regard to our DMA Contract Number I-DMA-F32 pertaining to the Mineral Hill Mine in Pima County, Arizona.

This contract specifies that we can use the services of an engineer for only one fourth of his time.

We cannot complete the necessary mapping, sampling and surveying if the engineer can spend only one fourth of his time on the project, especially now that we have been asked to submit monthly maps along with our reports.

For that reason we request that this contract be amended to allow for the services of an engineer for one half of his time in the amount of $240.00 per month.

Inasmuch as we have not completed our work at Mineral Hill and still have contract money remaining, we request that the contract be amended to extend the time limit to July 29, 1953 for completion of the project.

Sincerely yours,

Banner Mining Company

By A. B. Bowman
A. B. Bowman
Superintendent

ABBrfmb

Copper
No. 4

AMENDMENT OF CONTRACT: No. I-DMA-E32

Contract Docket No. DMA 269X-A, dated June 29, 1951, between the United States of America and Banner Mining Company is hereby amended as follows, effective as of December 21, 1951:

> Referring to Exhibit D attached to Exploration Project Contract Form MF-200, and the amendment thereof dated February 16, 1952, which amended Exhibit D to be effective December 21, 1951, under the subheading: "Add in lieu of matter deleted, the following:" after the labor class of "watchman", add the following:

Number	Class	Base Pay Per Eight-Hour Shift
3	Miners	13.56
3	Helpers	12.20
1	Hoistman	13.56

This amendment shall not be construed to increase the estimated total cost of the project, the aggregate total amount which the Government may pay or the percentage of the costs which the Government may pay under the provisions of Article 11 of the contract form.

Dated April 11, 1952.

BANNER MINING COMPANY

By E. F. Bowman, Pres.

ATTEST:

W. H. Hood
Secretary

UNITED STATES OF AMERICA

By J. H. [illegible]
Executive Officer - DMA

jwo

[illegible] 14 1952

Contracts + Audit

No. 3

AMENDMENT OF CONTRACT: No. I-DMA-E32

Contract Docket No. DMA 269XA, dated June 29, 1951, between the United States of America and Banner Mining Company is hereby amended as follows, effective January 20, 1952:

Referring to Exhibit C attached to Exploration Project Contract Form MF-200 under heading, "Following is a list of operating equipment to be furnished by the operator with the allowable monthly rental and repair costs", strike out the following:

"(c) 1 - 445 cu. ft. G.D. Diesel compressor, 9,000.00, 8 yrs., 150.00, 0.03.

(c) This compressor has been rented by the operator and we are charging exactly the monthly rental charged us by the A. S. & R. Company."

Insert the following:

"1 - 686 C.F.M. G.D. compressor with 125 H.P. electric motor complete with starter, value $7,870.00, five year life, allowable monthly depreciation, $131.16."

This amendment shall not be construed to increase the estimated total cost of the project, the aggregate total amount which the Government may pay or the percentage of the costs which the Government may pay under the provisions of Article 11 of the contract form.

Dated 2-16, 1952.

BANNER MINING COMPANY

By E. S. Bowman
Pres

ATTEST:

W H Hood
SECRETARY

UNITED STATES OF AMERICA

By J. H. Ewell Jr
Executive Officer - DMA

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
MAR 14 1952

Contracts & Audit Div.

No. 2

AMENDMENT OF CONTRACT: No. I-DMA-E32

Contract Docket No. DMA-269X-A, dated June 29, 1951, between the United States of America and Banner Mining Company is hereby amended as follows, effective December 21, 1951:

Referring to Exhibit D attached to Exploration Project Contract Form MF-200, delete the following:

Number	Class	Base Pay Wage Per 8-Hour Shift
2	Shaft Leadmen	$13.40 (a)
4	Shaft Men	12.76 (a)
2	Hoistmen	11.96 (a)
1	Carpenter	12.92 (a)
2	Helpers	10.92 (a)
1	Mechanic	12.92 (a)

Supervision and Engineering

*1 - Superintendent @ $361.00 per month
*1 - Foreman @ 255.00 " "
*1 - Engineer @ 110.00 " "

Under the same title, *Note, second paragraph, delete the following: "in the amount of $110.00 per month."

Add, in lieu of matter deleted, the following:

Number	Class	Base Pay Wage Per 8-Hour Shift
2	Shaft Leadmen	$15.04
4	Shaftmen	14.40
2	Helpers	12.20
2	Hoistmen, Single drum	13.56
1	Carpenter	14.08
1	Mechanic	14.08
1	Miner or semi skilled shopman	13.56
2	Electricians	16.00
1	Watchman	6.64

Supervision and Engineering

*1 - Superintendent @ $381.00 per month
*1 - Foreman @ 275.00 " "
*1 - Engineer @ 120.00 " "

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
MAR 14 1952

This amendment shall not be construed to increase the estimated total cost of the project, the aggregate total amount which the Government may pay or the percentage of the costs which the Government may pay under the provisions of Article 11 of the contract form.

Dated 2-14, 1952.

BANNER MINING COMPANY

By E. S. Bowman
Pres.

ATTEST:

W. H. Hazel
Secretary

UNITED STATES OF AMERICA

By J. H. Emmons
Executive Officer - DMA

AMENDMENT OF CONTRACT: No. I-DMA-E32

Contract Docket No. DMA-269X-A, dated June 29, 1951, between the United States of America and Banner Mining Company is hereby amended as follows:

1. Referring to Exhibit "C" attached to Exploration Project Contract Form MF-200, under the title, "Following is a list of operating equipment to be furnished by the operator with the allowable monthly rental and repair costs" add the following:

   "1 6-Ton Diamond T flat bed winch truck at the rate of $2.00 per hour for time actually used on or for this project."

2. Referring to Exhibit "D" attached to Exploration Project Contract Form MF-200, under the title, "Following is a schedule of labor by numbers and classes with wage or salary for each class. Also shown are salaries for foreman, engineer and superintendent" add the following:

   "2 Electricians at $2.00 per hour".

3. Under the same title, subtitle, "Supervision and Engineering", add the following:

   "1 Bookkeeper at the rate of $65.83 per month."

This amendment shall not be construed to increase the estimated total cost of the project, the aggregate total amount which the Government may pay or the percentage of the costs which the Government may pay under the provisions of Article 11 of the contract form.

Dated November 20, 1951.

BANNER MINING COMPANY

By [signature]

UNITED STATES OF AMERICA

By [signature]
Executive Officer - DMA

Nov 26 9 13 AM '51
DEFENSE MINERALS ADMINISTRATION WASHINGTON, D.C.

MF-200
(April 1951)

Docket No. I-DMA-269-X-A
Commodity COPPER

I-DMA-E-32
I-DMA-E-32

Index Steve
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Card
Reviewed 3/31/51

UNITED STATES OF AMERICA
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION

EXPLORATION PROJECT CONTRACT [1]

It is agreed this 29 day of June, 1951, between the United States of America, acting through the Department of the Interior, Defense Minerals Administration, hereinafter called the "Government," and [2]
Banner Mining Company
2042 Conner Stravenue
Tucson, Arizona

hereinafter called the "Operator," as follows:

1. *Authority for contract.* This agreement is entered into under the authority of the Defense Production Act of 1950, pursuant to Mineral Order 5, entitled "Regulations Governing Government Aid in Defense Exploration Projects."

2. *Operator's property rights.* The exploration project shall be conducted on that certain property situated in the State of Arizona, County of Pima described as follows: [3]

See attached Annex I

with respect to which the Operator represents and undertakes: [4]

(*a*) That he is ~~the sole owner~~, in possession and entitled to possession, and that the property is subject only to the following claims, liens, or encumbrances as to each of which the subordination agreement of the holder is attached:
Claims - Banes, Copper Hill & Milton. Applicant is Lessee from the Barnsdall Mining Company. Owners - Anne M. Phippen, Daniel Kirby Phippen, Charles C. Chaffee, Jr., Anne Chaffee, Everett H. Dobbs and Vera L. Dobbs.

(*b*) That he is a lessee, in possession and entitled to possession, and the ~~subordination~~ agreement of the ~~lessor~~ Lessee is attached. Annex 2

3. *Exploration project.* The Operator, within 15 days from the date of this contract shall commence work on a project of exploration for [5] Copper; shall prosecute the work efficiently, expertly, in a workmanlike manner, in accordance with good mining standards, with suitable and adequate equipment, materials, and labor, all properly designed to bring the project to completion within a period of [6] 12 months from the date of this contract. The exploration project and the work to be performed are more fully described on Exhibit "A" attached hereto, which, with any maps or drawings thereto attached, is made a part of this contract.

4. *Performance of the work.* The work shall be performed by the Operator, under his sole direction and control: *Provided,* That with the consent of the Government and its written approval of the contract or contracts, all or any part of the work may be performed by the Operator through contract or contracts with independent contractors. The Government shall have the right to enter and observe and inspect the work at all reasonable times, and the Operator shall provide the Government with all available means for doing so. The Government may consult with and advise the Operator on all phases of the work.

5. *Fixtures and improvements.* The Operator shall devote the land and all existing improvements, facilities, buildings, installations, and appurtenances to the purposes of the exploration project without any allowance for the use, rental value, depreciation, depletion, or other cost of acquiring, owning, or holding possession thereof. Attached hereto, marked "Exhibit 'B'," is a detailed list of additional facilities, buildings, and fixtures, to be purchased, installed, or erected by the Operator, with the estimated cost of each, to which the Government will contribute its agreed pro-rata share of the cost. The difference between the cost of such additional facilities, buildings, or fixtures, and the salvage value thereof at the conclusion of the work, shall be charged as a cost of the project to which the Government has contributed its pro-rata share.

6. *Operating equipment.* Attached hereto, marked "Exhibit 'C'," is a detailed list of operating equipment divided into categories of items to be rented, purchased, or furnished by the Operator, with the allowable rental, purchase price, or rental value, as the case may be, annexed to each. As to equipment purchased for the project, the Government will contribute its agreed pro-rata share of the cost thereof, and the difference between the cost and the salvage value at the conclusion of the work shall be charged as a cost of the project to which the Government has contributed its pro-rata share.

[1] If sufficient space is not provided in any blank, use an extra sheet of paper and refer to it in the blank.
[2] State name, address, and nature of organization if any.
[3] Give legal description or enough to identify the property.
[4] Strike out the provision not applicable.
[5] Name of mineral.
[6] Not in excess of 2 years.

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CONTRACT SERV.
G.A.O.

7. *Title to and disposition of property.* All facilities, buildings, fixtures, equipment, or other items costing more than $50 each, paid for or purchased with funds contributed jointly by the Operator and the Government, shall belong to the Operator and the Government jointly, in proportion to their respective contributions, and upon the termination of the contract, if they have any salvage value, shall be disposed of for their joint account unless the Government, in writing, waives its interest in any such items. The Government may require the dismantling, severance from land, and removal of any such items in order to realize its interest in the salvage value thereof, and the cost of any such removal and of the disposal of the items shall be for the joint account of the parties in proportion to their respective interests.

8. *Labor and supervision.* Attached hereto, marked "Exhibit 'D'," is an itemized schedule of labor, by numbers and classes (miners, muckers, millmen, etc.), and of supervisors, by numbers and positions, with the maximum wages or salaries that may be paid to each as an allowable cost of the project.

9. *Rehabilitation and repairs.* Attached hereto, marked "Exhibit 'E'," is a detailed schedule of existing facilities, buildings, installations, and fixtures, with a statement of the cost of any necessary rehabilitation or repairs to put into useful and operable condition, which cost shall be allowed as a cost of the project.

10. *Allowable costs of the project.* The allowable costs of the project in which the Government will participate are limited to the necessary, reasonable, direct costs of performing the exploration work, including the costs of materials, supplies, engineering, power, water, and utilities, including items of equipment costing less than $50 each; and the costs referred to in Articles 5, 6, 8, and 9, and the exhibits annexed to and referred to in the contract. Although the Government may pay part of the cost of new or additional facilities, structures, buildings, and equipment, only the depreciation on such items, computed as indicated in Articles 5 and 6, will be charged as a cost of the project. No items of general overhead, corporate management, interest, or any other indirect costs not expressly allowed by these regulations, or work performed or costs incurred before the date of this contract, shall be allowed as costs of the project in which the Government will participate.

11. *Participation by the Government.* At the end of the first full calendar month after the Operator has commenced work under the project, and at the end of each succeeding calendar month, the Operator shall submit to the Government a voucher for payment with a detailed statement of work done and allowable costs (as defined in Article 10 of this agreement) incurred, in a form and with supporting data acceptable to the Government. After approving the voucher, the Government shall pay to the Operator 50 percent of the sum of such costs incurred; *Provided,* That the aggregate total of all sums paid by the Government under this agreement shall not exceed $163,393.00, which is 50% percent of the agreed estimated total cost of this project, $126,789.00.

12. *Accounts and audits.* The Operator shall keep suitable records and accounts of operations, which the Government may inspect and audit at any time. The Government may at any time require an audit of the Operator's records and accounts by a certified public accountant, the cost thereof to be treated as a cost of the project. The Operator shall keep and preserve said records and accounts for at least 3 years after the completion of the project or the termination of this contract.

13. *Progress reports.* The Operator shall provide the Government with monthly reports of progress in form and content satisfactory to the Government, and upon the completion of the project or termination of the contract shall provide the Government with a comprehensive geologic and engineering report, including an estimate of ore reserves, to the best of his ability. Four copies of all reports shall be furnished to the Government.

14. *Repayment by Operator.* If, upon the completion of the exploration project or termination of the contract, the Government considers that a discovery or development has resulted from the work from which commercial production of ore may be made, the Government, within 6 months thereafter shall so certify to the Operator, particularly describing and delimiting its estimate of the discovery or the development. Thereafter, if and as ore is produced as a result of such discovery or development, the Operator and his successor in interest shall be and become obligated to pay to the Government a percentage royalty on the net smelter returns or other net proceeds realized from such ore, concentrates, or metal produced within ten (10) years from the date of this contract, until the total amount contributed by the Government, without interest, is fully repaid or said 10 years have elapsed, whichever occurs first, as follows:

Of net smelter returns or other net proceeds not in excess of eight dollars ($8.00) per ton of ore: One and one-half (1½) percent.

Of net smelter returns or other net proceeds in excess of eight dollars ($8.00) per ton of ore: One and one-half (1½) percent, plus one-half (½) percent additional for each full fifty cents ($0.50) in excess of eight dollars ($8.00) per ton of ore, but not in excess of a maximum of five (5) percent.

This obligation to repay from net returns or proceeds shall be and remain a claim and lien upon the property which is the subject of the exploration project and upon any production resulting from such discovery or development, in favor of the Government, until fully paid, or until said 10-year period has elapsed; and this claim and lien and the Government's right to repayment shall survive any termination of the contract, whether by completion of the exploration project or otherwise. This article is not to be construed as imposing any obligation on the Operator or his successor in interest to produce ore from any such discovery or development.

15. *No assignment of contract.* Without the written consent of the Government, the Operator shall not assign or otherwise transfer or hypothecate this contract or any rights thereunder.

16. *Termination and completion.* The Government may, at any time, by written notice to the Operator, terminate this contract: (*a*) If the Operator fails to provide his share of the money necessary to prosecute operations pursuant to the terms of the contract; (*b*) if the Operator, in the opinion of the Government, fails to prosecute operations pursuant to the terms of the contract; or (*c*) if in the opinion of the Government, operations up to the time of the notice have not indicated the probability of making any worthwhile discovery and in the opinion of the Government further operations are not justified. Upon the completion of the project or any termination of the contract the Operator shall render to the Government a full and final accounting of his operations under the contract and his expenditures of money; shall dispose of any unused materials, supplies, and equipment for the joint account of the Operator and the Government in the proportion of their respective interests; and shall pay to the Government its pro-rata share of any money remaining.

Executed in triplicate the day and year first above written.

Banner Mining Co.
(Operator)

By [signature]
President

THE UNITED STATES OF AMERICA

By [signature]
Administrator
Defense Minerals Administration

U. S. GOVERNMENT PRINTING OFFICE 16—64066-1

Mineral Hill Mine

Annex I

Those certain mining claims located in the Pima Mining District and known and described as follows:

1. Banes claim Patented survey	#1649
2. Copper Hill claim Patented survey	#1649
3. Milton claim Patented survey	#1649

These claims are located in section 2, Township 17 South, Range 12 East G & S R M and section 35 Township 16 South, Range 12 East G. & S.R.M.

Mineral Hill Mine

Annex 2

WHEREAS, the subordination agreement of the lessor, required by paragraph numbered 2 (b) of the annexed contract, has not been obtained; and

WHEREAS, the United States of America has agreed to waive requirement of the lessor's subordination agreement.

NOW THEREFORE, in consideration of said exploration project contract and of the foregoing, the Operator hereby undertakes and agrees to pay all sums that may fall due and owing to the United States of America under the terms of said contract in the same manner and to the same extent as if the subordination agreement of the lessor had been given. If for any reason the net smelter returns from operations that would be subject under said contract to such payments to the Government are not available as a means of measuring the amount of such payments, then the Operator agrees and undertakes to make such payments according to the best estimates of the amounts that can reasonably be made, and in the event of dispute as to such estimates, the Operator agrees that the determination thereof by either the Administrator of Defense Minerals Administration or by the Director of the United States Bureau of Mines shall be final and binding upon the Operator.

Banner Mining Company

Mineral Hill Mine

Exploration Project Contract

Exhibit A

Question #3 - Form MF-200

Applicant proposes (1st) to rehabilate the Mineral Hill mine, so the 3 lower levels of the underground workings can be made accessible for an examination to verify a reported underground ore reserve of about 200,000 tons averaging 3.36% copper and to make an underground geological study on which to base an underground exploration program provided the examination proves additional exploration adviseable.

2nd To do the following exploration work provided the above is concluded successfully and the geological study indicates this work adviseable: diamond drilling on the 500 and 600 foot levels together with drifting and cross cutting on the 600 level to prove up other indicated orebodies.

On the following attached sheets the exploration program is set forth in detail.

This mine was operated during the period 1915 to 1920 and since 1920 the mine has been idle and filled with water. Between 1915 and 1917 production amounted to 46,631 tons of 3.80% copper ores. The years 1917 through 1920 were devoted entirely to development and exploration work, blocking out ore preparatory to building a mill. This work costing between $250,000 and $300,000 evidently resulted in blocking out of an apparently large volume of garnet-chalcopzrite ore the average assay of which is about 3.35% copper.

The ore mineralization developed to date appears to be localized by the east-west pre-ore fault zone. This fault can be traced on the surface from just north of the No. 1 shaft over the hill and down to the east just north of the No. 3 shaft, where it is exposed in the old surface stopes and near surface workings. It can also be traced westward from #1 shaft approximately 400 feet, being shifted twice in this distance by cross faults. The ore is largely found in garnetized limestone generally near the contact with the granite footwall.

Exhibit A - Continued

Summary of Estimated Cost of Proposed Reopening and Rehabilation of Mineral Hill Mine together with exploration program.

(1)	Power Installation (Includes Transformer substation)	$10,000.00
(2)(a)	Repair and make accessible and passable as a ventilation shaft and as a second exit as prescribed by law the 500 foot vertical two compartment shaft @ $30.00 per foot	15,000.00
(3)	Repair and retimber to make accessible and unwater, 700 foot vertical depth, incline shaft and install pipe and rails @ $30.00 per foot (Estimated total depth of this shaft- 900 feet)	27,000.00
(4)	Install 45 foot headframe, bins and 75 H.P. Hoist at incline shaft	6,300.00
(5)(a)	Repair Headframe at vertical shaft and install 20 H.P. Hoist	1,500.00
(6)	Clean out, retimber if necessary to hold open, the indicated drifts and crosscuts on attached plan map totaling about 3900 feet @ $7.00 per foot together with about 400 feet of raises @ $10.00 per. This work is detailed as follows:	
	500 foot level 1600 feet of drifts and crosscuts @ $7.00 per foot	11,200.00
	600 level 1800 feet of drifts and crosscuts @ $7.00 per foot	12,600.00

Exhibit A - Continued

700 level
*500 feet of drifts and crosscuts
@ $7.00 per foot $ 3,500.00

(7) Diamond Drilling, Drifting and Cross-cutting program detailed as follows:

500 Level
** 600 feet of flat Diamond Drilling as indicated on attached plan map as holes #1, 2 & 3 to locate the extension of H.W. orebody as exposed on the 600 level and the extension of the faulted segiment of the orebody as found on the west end of the 600 level @ $4.00 per foot 2,400.00

600 Level
** 400 feet of drifting on or near the contact toward ore shoots just north and north east of #3 shaft as indicated on plan map to reach position from which Diamond Drills holes can be drilled @ $27.00 per foot. Drifts 6' X 8'. 10,800.00

** 3 - diamond drill holes #4, 5 & 6 totaling 900 feet from the station reached in drift above to intersect ore shoot at #3 shaft @ $4.00 per foot 3,600.00

(8) Sampling and assaying 2,100.00

(9) Geological Study (Surveying and maping) 800.00

(10) Estimated compensation Insurance, social security & other taxes 5,300.00

Total $112,100.00

* Estimated footage on account of no maps being available

** This work is subject to prior approval of the field engineers of the Government.

Exhibit A - Continued

Summary of Total Cost including costs of new facilities and machinery and repairs to present facilities.

Cost of work (shown above)	$112,100.00
Hoist House and combination changeroom and shop	5,450.00
Additional equipment	8,656.00
Repairs to existing facilities	580.00
Total cost of Project	$126,786.00

Note -

(a) This vertical shaft is needed mainly for ventilation purposes so if after unwatering the incline shaft, we find that the vertical shaft is open then only such work will be done on the vertical shaft to comply with the mine inspectors regulations.

It is agreed that the entire existing mine and facilities are included in the exploration project, and that the existing mine and facilities and all ore deposits therein shall be subject to the Government's claim for repayment under Article 14 of the contract form regardless of whether any "discovery or development" results from the work carried on under this contract.

Mineral Hill Mine

Following is a breakdown on costs of drifting which we will do on the 600 level on a per foot basis.

Labor	$13.76
Supplies	13.02
Mach. cost	.22
	$27.00

Exhibit B

Following is a detailed list of additional facilities, buildings and fixtures to be purchased, installed or erected by the operator with the estimated cost of each:

1.	40' X 40' steel frame, galvanized iron clad combination shop and changeroom with cement floor. $\frac{1}{2}$ cost - $\frac{\$7500}{2}$ chargeable against the project	$3,750.00
1.	20' X 25' Hoist House wood frame, dirt floor galvanized iron clad with aluminum window frames	1,700.00
	Total	$5,450.00

Exhibit C

Following is a list of additional equipment to be purchased for operating the proposed project as a need for same arises:

1 -	300 amp. Arc Welder and accessories	$ 640.00
1 -	1200 foot 3/4" Hoist cable for incline shaft	400.00
1 -	800 foot 3/4" Hoist cable for vertical shaft	266.00
1 -	Electric saw for framing	175.00
1 -	20 H.P. Blower for lower levels of incline shaft (Champion)	700.00
1 -	Royal Typewriter (extra width)	170.00
1 -	Marchant calculator	500.00
1 -	Chain hoist for shop	75.00
2 -	I.R. - 3" - 3½" drifter drills with hoses, oilers, connections and accessories	2,550.00
1 -	Eimco 12 B Mucking Machine with hoses plus freight to Tucson	3,180.00
	Total	$8,656.00

Exhibit "C" - Continued

Following is a list of operating equipment to be furnished by the operator with the allowable monthly rental and repair costs.

Equipment	Value	Life	Monthly Depreciation or rental	Repair cost per foot advance
1-75 H.P. Single Drum Hoist	$4,000.00	8 yrs.	$ 41.66	$0.03
(a) 1-20 H.P. Single Drum Hoist	1,600.00	8 yrs.	16.66	0.01
2-50 H.P. I.E. Centrif. Pumps	2,500.00	5 yrs.	41.66	0.04
(b) 1 - Essich concrete mixer	600.00	5 yrs.	4.16	None
(c) 1-445 cu. ft. G.D. Diesel Compressor	9,000.00	8 yrs.	150.00	0.03
8 - Mine cars	960.00	8 yrs.	10.00	0.01
1 - 15 H.P. - cut off saw	350.00	5 yrs.	5.83	None
(d) 1-300 amp. arc welder	-------	------	-------	None
(d) 1 - electric saw for framing	-------	------	-------	0.01
(d) 1-20 H.P. Champion Blower	-------	------	-------	0.01
(d) 2 - 3-3½" I.R. Drifter Drills	-------	------	--------	0.02
(d) 1 - Eimco 12 B Mucking Machine	-------	------	-------	0.02
	Totals		$269.97	$0.18

Total footage of advance is 7600' and includes shaft reopening and cleanout and timbering drifts where necessary, diamond drilling, raise cleanout and timbering where necessary.

Exhibit "C" - Continued

Equipment rental cost per foot advance $\frac{269.97}{7600}$ =		$0.036
Repair cost per foot advance		0.18
Total Equipment cost per foot advance		$0.216

Note -
(a) rental on 20 H.P. hoist will only be charged during the time it is used to re-open and make the vertical shaft accessible and passable, if necessary.

(b) Rental on concrete mixer will only be charged for during months it is actually used.

(c) This compressor has been rented by the operator and we are charging exactly the monthly rental charged us by the A.S. & R. Company.

(d) The arc welder, Electric framing saw, Champion 20 H.P. blower, 2 drilling machines and 1 Eimco Mucking Machine are to be joint purchases of the government and operator as indicated in previous page of exhibit "C". Repair cost per foot advance is shown as a charge against this project.

Exhibit D

Following is a schedule of labor by numbers and classes with wage or salary for each class. Also shown are salaries for foreman, engineer and superintendent.

Number	Class	Base Pay Wage per 8 hour shift
2	Shaft Leadmen	$13.40 (a)
4	Shaft Men	12.76 (a)
2	Hoistmen	11.96 (a)
1	Carpenter	12.92 (a)
2	Helpers	10.92 (a)
1	Mechanic	12.92 (a)

Supervision & Engineering

*1 - Superintendent @ $361.00 per month
*1 - Foreman @ $255.00 per month
*1 - Engineer @ $110.00 per month

*Note - The above figures on the Superintendent and Foreman are one half of the monthly salary rates as ½ of their time will be spent on the Mineral Hill and ½ on the Twin Buttes project.

The Engineer will spend ½ of his time in Arizona on the above mentioned projects and ½ of his time at our Lordsburg property. Therefore ¼ of his salary will be charged to this project in the amount of $110.00 per month.

(a) In addition to the indicated base pay, operator must pay time and one half (overtime for Saturday), night shift differential, contract bonus on headings and such labor charges as vacations, group insurance and workmen's Compensation Insurance. (Present rate for Workers Compensation Insurance is 10% of the payroll.

Exhibit B

Following is a list of repairs to existing surface buildings and fixtures with a statement of necessary costs to put same in useful and operable condition.

(1)(a)	Install sheave wheel, brace frame and install footings on 28 foot	
(a)	Headframe at vertical shaft	$1,000.00
(2)	Walling off section of present warehouse for office space 12' X 20'	300.00
(3)	Installing shelving in Warehouse Building	280.00
	Total	$1,580.00

Note -

(a) This cost has already been included in item 5 of Exhibit A.

TWIN BUTTES MINES

ESTIMATED COST OF POWER LINES

4 3/4 Miles 44,000 Volt Power Line	$ 20,000.00
Substation at Kine Mine 44,000 V to 2400 V to 440 V	16,000.00
2500 Feet 2400 Volt Power Line to Queen and Glance Shafts	2,500.00
Substation at Glance Mine 2400 V to 440 V	8,000.00
Substation at Queen Mine 2400 V to 440 V	8,000.00
TOTAL ESTIMATED POWER LINES COST	$ 54,500.00

EXHIBIT B

Form MF-103
(April 1951)

U. S. DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION

Budget Bureau No. 42-R1035.
Approval expires 6-30-51.

APPLICATION FOR AID FOR AN EXPLORATION PROJECT PURSUANT TO MINERAL ORDER 5, UNDER DEFENSE PRODUCTION ACT OF 1950

DO NOT FILL IN THIS BLOCK

Docket No. dma 269 X-A

Date received 5-26-51

Participation

Banner Mining Company
Mineral Hill Mine
2042 Conner Stravenue,
Tucson, Arizona

Name and address of applicant

Date May 16, 1951

FILL IN THIS BLOCK

Date of application December 18, 1950

Estimated cost $ 131,300.00

Mineral or metal Copper

Percentage of Government participation 50%

Location of mine Pima Mining District
Pima County, Arizona

Date of filing MF-100 May 16, 1951

DMA Docket Number, if available 269 X-A

INSTRUCTIONS

Read Mineral Order 5, Regulations Governing Government Aid in Defense Projects, before completing this application. Submit four signed copies of the application to Defense Minerals Administration, Department of the Interior, Washington 25, D. C., or to the nearest field executive officer thereof, with your name and address on each sheet of the application and all accompanying papers. If any question is inapplicable, or if you cannot answer it, so state on the form. Where the space provided for answer is insufficient, answer on a separate sheet, annex it to the application form, and refer to it in space for answer. If the application is approved, you will be presented with an exploration project contract on Form MF-200, for your signature.

THE APPLICANT

*1. Is applicant an individual, partnership, or corporation? Corporation

*2. If a partnership, state names and addresses of partners. Not applicable.

*3. If a corporation, state names and addresses of officers, directors, and five largest stockholders. See attached sheets.

*4. Describe the mining and general business experience of (*a*) the applicant, and (*b*) the person or persons who will manage the project. See attached sheets.

*5. Are you the owner or the lessee of the property? Lessee

6. If owner, state what claims, liens, or encumbrances, if any, are against the property. Not applicable

7. If lessee, attach a copy of the lease and state if it is in good standing. Lease is in good standing.

NOTE.—It will be necessary to procure and attach to the exploration project contract agreements of claimants, lienors, encumbrances and lessors subordinating their interests in the property to the interest of the Government under the contract. See attached sheets - Agreement.

8. Furnish current financial statement, showing assets and liabilities, and a profit and loss statement. See attached reports

9. How much money is applicant prepared to invest in proposed project? Is it sufficient to pay your part of the cost of the project as detailed in question 23 of this application form, in accordance with the regulations on Government participation (Section 9 of Mineral Order 5)? See attached sheets.

*If you have already answered these questions on MF-100, you are not required to answer the questions for this application.

16—64067-1

THE PROPERTY

10. (*a*) Give a description of the real property that will be in any way involved in the exploration project, including any existing mine or operating property. See attached sheets.
    (*b*) Give the legal description of the exact parcel, plot, or area upon which the exploration is to be conducted. See attached sheets

    NOTE.—If both areas are the same, so state. The only obligation to repay the Government is from the net earnings from any commercial discovery made in the area specified in (*b*) above in which the exploration is to be conducted, and the expenditure of funds which may be charged as costs of the project must be limited to that area or to work necessary to perform the exploration in that area.

*11. State the present and former names of the property, if any. See attached sheets.

*12. State, in detail, the location of the property with reference to towns, railroads, roads, shipping points, including distances and directions and kinds and conditions of roads. See attached sheets

*13. State source and quantity of water available for operations and its sufficiency at all seasons. See attached sheets
State amount of power to be used, rate per hour or other cost, and source. See attached sheets.

*14. Describe any existing useable facilities, equipment, buildings, or structure now on the property that will be devoted to the exploration work. See attached sheets.

15. State in detail how the ore could be shipped and how and where milled. See attached sheets.

*16. History:
    (*a*) Give a statement, as complete as possible, of previous exploration, development, operation, and production of property, with reasons for any past suspensions of operations. See attached sheets.
    (*b*) State briefly the known history and production of adjoining and neighboring properties. See attached sheets.
    (*c*) Furnish any available (private) reports that may apply to this application, including results of mine examinations, recommended exploration and development, and metallurgical investigations. Previously furnished D.M.A. Docket Number 269

*17. Production:
    (*a*) If mine is in production, furnish the following information: Mine is not yet in production.

	Tons per day	*Grade or analysis*	*Cost per ton*	*Net value per ton*
(1) Mining				
(2) Milling				
(3) Shipped or sold				

*18. Ore or mineral reserves: (If property is or has been operating.)
    (*a*) Describe the ore or mineral deposits briefly. See attached sheets.
    (*b*) Submit available maps and assay data. Previously furnished D.M.A. Docket Number 269
    (*c*) Give estimated tonnage and grade of each class of ore reserves. See attached sheets.

19. State any conditions or circumstances regarding the property not sufficiently brought out by the foregoing questions.

THE EXPLORATION

20. For what mineral or minerals and for what types of deposits and ores will the exploration be conducted? See attached sheets
21. Describe briefly, but concisely, the proposed work and the estimated time required to complete it. See attached sheets.

    NOTE.—The Government will not participate in a project that will require more than 2 years to complete.

22. Furnish statement of the geological basis of the project with particular emphasis on factors leading the operator to expect the finding of commercial ore bodies. This statement should be accompanied by supporting maps such as geological maps, maps of the proposed openings and assay maps, sample lists, and other pertinent data. See attached sheets. Data previously submitted under D.M.A. Docket Number 269.

THE REQUIREMENTS AND COSTS

23. Tabulate in the form of an itemized statement with a sum for each item the estimated requirements and costs of the project so that the total will give the estimated cost of the project in which the Government will participate, as follows:
    (*a*) Labor, by numbers and classes (miners, muckers, millmen, etc.), with wages of each. See attached sheets.
    (*b*) Supervisors, by numbers and positions, with salaries of each. See attached sheets.
    (*c*) Cost of necessary repairs to existing facilities, structures, and buildings. See attached sheets.
    (*d*) Cost of necessary installation or construction of additional facilities, structures, and buildings. See attached sheets.
    (*e*) Cost of items of equipment, not now owned by the applicant which must be purchased for operations at a cost of $50 or more each. See attached sheets
    (*f*) Cost of rental for equipment which the operator proposes to rent. See attached sheets
    (*g*) Rental value of items of equipment which the operator now owns and which will be devoted to the work. See att. sheets
    (*h*) Cost of materials and supplies, including items of equipment costing less than $50 each. See attached sheets.
    (*i*) Cost of power, water, utilities, and any other items not provided for above. See attached sheets.

24. Furnish a time schedule of the project, stated in terms of months after project is approved, showing progress expected to be accomplished and the money expected to be spent. See attached sheets.

CERTIFICATION

The undersigned company, and the official executing this certification on its behalf, hereby certify that the information contained in this form and accompanying papers is correct and complete to the best of their knowledge and belief.

Banner Mining Company
(Name of company)

By [signature]
(Signature of authorized official)

May 16, 1951
(Date)

President
(Title)

Title 18, U. S. Code (Crimes), Section 1001, makes it a criminal offense to make a willfully false statement or representation to any department or agency of the United States as to any matter within its jurisdiction.

*Same as footnote on page 1.

16—64067-1 U. S. GOVERNMENT PRINTING OFFICE

Banner Mining Company
2042 Conner Stravenue

Mineral Hill Mine
Tucson, Arizona

MF - 103 Question 3.

OFFICERS

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R.E.Garnett,	2nd Vice-President	2131 N.W. 16th Street, Oklahoma City, Oklahoma
W.H.Hardy,	Secretary-Treasurer	3529 N.W. 19th Street, Oklahoma City, Oklahoma

DIRECTORS

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E.S.Bowman	P.O. Box "X", Lordsburg, New Mexico
R.E.Garnett	2131 N.W. 16th Street, Oklahoma City, Oklahoma
W.H.Hardy	3529 N.W. 19th Street, Oklahoma City, Oklahoma
L.L.Travis	6007 Glendora Avenue, Dallas, Texas.

FIVE LARGEST STOCKHOLDERS

H.I.Grimes	316 N.W. 18th Street, Oklahoma City, Oklahoma
E.S.Bowman	P.O.Box "X", Lordsburg, New Mexico
Mrs. Ruth Wallace	P.O.Box 2482, Waterloo, Iowa
L.L.Travis	6007 Glendora Avenue, Dallas, Texas.
W.S.Bellows	P.O.Box 2132, Houston, Texas.

Banner Mining Company Mineral Hill Mine

2042 Conner Stravenue Tucson, Arizona

MF - 103

Question 4

(a) Banner Mining Company has operated the Bonney and Miser's Mines at Lordsburg, New Mexico together with its 500 ton Flotation Mill at the same location since 1935. During this period we have mined and milled a total of about 1,700,000 tons of low grade copper ores with a copper content in excess of 85,000,000 pounds.

(b) A. B. Bowman will be Superintendent of the Arizona operations. He has been Superintendent of our Lordsburg Plant since 1945. He has been connected with the Company at Lordsburg since 1936, starting as Engineer.

Question 9

$ 65,650.00 Yes.

Question 10

(a) The portion of the Mineral Hill Property coming under this exploration project consists of a 700 foot incline shaft located on the Banes Claim, Patent Survey Number 1649 and a 500 foot vertical shaft located on the Copper Hill Claim Patent Survey Number 1649 together with the connecting drifts, cross-cuts and raises etc. These claims are located in section 2, Township 17 South, Range 12 East, G&SRM and Section 35, Township 16 South, Range 12 East G&SRM. A portion of the underground workings lap over into the Milton Claim, Patent Survey Number 1649. This claim joins the west end line of the Copper Hill Claim. All of this property is in Pima County of the State of Arizona about 16 miles south of Tucson.

(b) Same as (a) above.

Question 11

Present name is same as former name -- Mineral Hill Property.

Question 12

This property is located 16 miles South of Tucson, Arizona on a state maintained highwey. Eleven of the above 16 miles of road are hard surfaced. It is 8 miles West of Sahuarita, a point on the Southern Pacific Railroad. The mine is connected with Sahuarita by good improved roads.

Question 13

The mine records during the time it was operated up to 1920 show that the mine made approximately 250 gallons of water per minute. The present water level is 235' below the collar of Number 2 Vertical Shaft. The mine makes sufficient water for a 300 ton mill. The San Xavier Mine of the Eagle Picher Company, located 1 mile south, has offered us the necessary water for use in commencing operations. The Trico Electric Company is furnishing 300 K.V.A. of power for this project at the following rates: $1.75 per month per KW of billing demand, plus 2.0¢ per KWH for the first 50 KWH; 1.5¢ per KWH for the next 100 KWH; and .8¢ per KWH for all remaining KWH used per month.

Question 14

The 700 foot incline shaft and the 500 foot vertical shaft can be used after repairs and re-timbering. The Vertical shaft has a 25 foot wooden headframe over it, but will need repairing before it can be used. Our company has built a 30' x 50' wood frame, iron clad. concrete floor building for general use. We have moved some equipment from our Lordsburg plant for use here such as jack hammers, stoper, concrete mixer, water tanks, tools, drafting table and instruments, acetylene welding and cutting attachments, drill steel and bits, caterpillar Bulldozer. Also on the property is a 445 cubic foot Gardner Denver Compressor driven by a D 13000 Caterpillar Diesel Engine which we have rented. We also have a Diamond T Winch truck and a GMC 3/4 ton Pick-up Truck.

Question 15

Any shipping grade ore can be shipped via truck to the S.P. Railroad at Sahuarita 8 miles away for shipment either to the Inspiration Smelter at Inspiration, Arizona, or to the American Smelting and Refining Company Smelter at El Paso or Hayden.

The Eagle Picher Mill at Sahuarita takes custom ores and I have been advised by their manager that they will take some of our ore in the beginnings of our operation, depending of course upon mill tests and conditions when our ore becomes available.

Question 16

(a) Considerable oxidized copper ores were undoubtedly shipped prior to World War I, but no records are available. The Barnsdall Mining Company, a subsidiary of Barnsdall Oil Company, reports that 46,631 tons of ore were shipped during the period July 1915 to June 1917 which averaged 3.80% Copper and 0.77 ounces of Silver per ton.

From July 1917 through 1920 operations of the Barnsdall Mining Company were confined to exploration and development work. According to the Manager, F. H. Minard and Superintendent W. A. Fritchie they blocked out close to 500,000 tons of ore which would assay between 3 and 4% copper. Between $250,000.00 and $300,000.00 were expended on this work.

A change in Company policy in 1920 caused the closing of all Barnsdall Mines, to devote their future energies to oil.

(b) The San Xavier Mine of the Eagle Picher Company is located one mile South of Mineral Hill. It is reported they are mining and milling in excess of 300 tons per day of Lead, Zinc, Copper ores.

(c) A geological report by Dr. Harrison Schmitt together with Mine Level and Assay Maps and Claim Map were furnished with our original application D.M.A., Docket Number 269.

Question 18

The mine has not operated since 1920 and is under water below the 235 foot mark.

(a) The ore is chiefly chalcopyrite associated with pyrite in a garnet gangue and is probably related to the intrusive granite. It is localized along an east-west fault zone.

(b) All available maps and Assay Maps were submitted with original application D.M.A. Docket Number 269.

(c) W. A. Fritchie, Superintendent, and F. H. Minard, Manager of Barnsdall Mining Company during its operation up to 1921 set the ore reserves at close to 500,000 tons of ore averaging between 3 and 4% Copper.

Dr. Harrison Schmitt estimates from old company assay maps, level maps, and reports that 225,000 tons are available, under certain conditions, which will average about 3.4% copper.

Question 20

The exploration work will be conducted to find copper minerals. The mineralization assocated with the deposits are of the contact metamorphic type.

Question 21

The work required by this re-opening phase of this mine consists of:-

(1) Excavating for hoist, hoist house and headframe at incline shaft.
(2) Installing Hoist, headframe, bins and Hoist House.
(3) Bringing in Electric Power.
(4) Re-timbering, repairing and unwatering the 700 foot incline shaft and the 500 foot vertical shaft.
(5) Re-opening, re-timbering if necessary the bottom three levels of the mine and installing pipe and track.
(6) Build Warehouse, offices, changeroom, and shop buildings.

The idea of this work is to re-open this property for an underground examination. It should also put it in shape for some production and for further exploration work if it is then deemed adviseable.

The power will be available in September of this year according to estimate of power Company. We will have much of the preliminary work completed at that time and should be able to start the unwatering when we receive the power. I estimate that the unwatering and re-opening will be completed in December of this year, 1951, if we have good luck.

Question 22

The records of the Barnsdall Mining Company show that a large volume of garnet chalcopyrite ore which will assay about 3.35% copper has already been blocked out, by the exploration work they did from 1917 through 1920.

The following is a statement taken from Harrison Schmitt's report on the property relating to the mineralization and localization of ore.

" The mineralization associated with the Ore forming period is the contact pyrometasomatic type (popularly called contact metamorphic type) This mineralization is probably directly or indirectly related to intrusive granite. The limestone has been extensively marbleized, and locally, in broken ground, garnetized. Light and dark garnet seem to be the chief introduced silicates. There is a moderate amount of chlorite. The primary ore minerals are chiefly pyrite and chalcopyrite. These appear to be later than the garnet. They replace the garnet and follow fissures cut in the garnet. In the oxidized zone much of the ore is oxidized copper carbonates with garnet gangue."

Question 22 - Continued

" The ore mineralization developed to date appears to be localized by the east-west pre-ore fault zone previously described."

Assay maps, level maps, and vertical sections included in our original application show the ore blocked out by the exploration work done in 1920 and prior thereto. Please refer to this original application DMA Number 269.

Question 23

Our estimated cost on this re-opening exploration project is shown below and includes labor, supplies, and rentals, etc. Labor rates and salaries will be listed below together with all other information asked for. For the items of equipment which we own and will use on the project for a fair rental rate as listed below, we will expect a credit against our half of the costs incurred.

SUMMARY OF ESTIMATED COST OF PROPOSED REHABILITATION MINERAL HILL MINE

Power Installation	$ 10,000.00
Repair and retimber 500 foot Vertical Shaft	20,000.00
Repair, retimber, and unwater 700 foot Incline Shaft	25,000.00
Excavating for, and installation of Hoist at Incline Shaft	7,500.00
Headframe and Bins at Incline Shaft	6,300.00
Repair Headframe at Vertical Shaft and Install Hoist	1,500.00
Re-open and retimber the three lower levels and raises	28,000.00 —
Surface Buildings (Shop, Warehouse, Changeroom, Hoist Houses and Office	25,000.00
Equipment rentals and Purchases	3,500.00 — ? 6050
Compensation Insurance, Social Security and Other Taxes	4,500.00
TOTAL	~~$ 131,300.00~~ 133 850

(a) Six Shaftmen at $ 1.59½ per hour
One Hoistman at $ 1.49½ per hour
One Carpenter at $ 1.61½ per hour
Two Helpser at $ 1.36½ Per hour
1 Mechanic at $ 1.61½ per hour
One Warehouseman at $1.25 per hour. This man will be a combination warehouseman, timekeeper and clerk combination.

I estimate the total labor cost of this project at $ 42,000.00 which is included in costs shown above and below.

Question 23 - Continued

(b) One General Superintendent at $ 361.00
One General Foreman at $ 255.00
Part Time Engineer at $ 200.00

Note-Total cost of Supervision and Engineering estimated at $ 5,100.00
One Half of regular salaries of Supervision and engineering is chargeable to Mineral Hill project and one half to Twin Buttes project. The above figures are one half of the monthly salary rates. The above $ 5,100.00 total estimated cost of supervision and Engineering for this project is already included in the Summary Of Estimated Cost of Proposed Rehabilitation.

(c)	Repair and retimber 500 foot vertical shaft	$ 20,000.00	
	Repair and retimber and unwater 700 foot Incline Shaft	25,000.00	
	Repair Headframe at vertical shaft	750.00	
	Re-open and retimber where necessary the Three Lower Levels and Raises	28,000.00	
			$ 73,750.00
(d)	Surface Buildings		
	Changeroom, Warehouse, Shop and Office	$ 25,000.00	
	Excavation and Build Hoist House at incline shaft	7,500.00	
	Headframe and Bins at incline shaft	6,300.00	
	Hoist Installation at Vertical Shaft	750.00	
			$ 39,550.00
(e)	Arc Welder and Accessories	$ 640.00	
	1 - 1,075 foot Hoist Cable 3/4" for Incline shaft	375.00	
	1 - 750 foot Hoist Cable 3/4" for Vertical shaft	360.00	
	1 - Electric Saw for framing	175.00	
	1 - Blower for Lower Levels of Incline Shaft	600.00	
	1 - Typewriter	170.00	
	1 - Adding Machine	230.00	
			$ 2,~~4~~50.00 5
(f)	$ 150.00 per month for a Gardner Denver Compressor of 445 Cubic Feet per minute Capacity. Total		1,050.00

(g) 1-75 H.P. Single Drum Hoist $ 100.00 per month
1-20 H.P. Single Drum Hoist 50.00 per month
2- 50 H.P. I.R. Centrifugal Pumps - Total 130.00 per month
1 - Concrete Mixer - New 50.00 per month
1 - 15 H.P. Cut Off Saw 24" 20.00 per month

The costs of these equipment rentals are included in the Summary of Estimated Cost of Proposed Rehabilitation. We expect a credit against our half of the costs incurred.

2450

$350 x 7 mos.

Total Carried Forward $ 116,800.00

119350.00

Question 23 Continued

		119350
Total Brought Forward		$ ~~116,800.00~~
(h) Cost of supplies included in above costs.		
(i) Power Installation	$ 10,000.00	
Compensation Insurance - estimated	3,520.00	
Social Security Taxes	350.00	
Other Taxes	630.00 ?	
		14,500.00
Grand Total		$ 131,300.00
		133850

Question 24

I expect to have the following work completed by September when power will become available provided the project is approved immediately.

Inclined Shaft

(1) Excavation completed
(2) Hoist, headframe and bins installed.
(3) Shaft retimbered to a depth of 200 feet.
(4) Compressor Installed.

Vertical Shaft

(1) Headframe repaired
(2) Hoist installed
(3) Shaft repaired and retimbered to 200 foot level.

The following money is expected to be expended by September 1st.

Power Installation	$ 10,000.00
200 Feet Vertical Shaft repaired & retimbered	8,000.00
Repair and retimber 200 feet of Incline shaft and install pipes and pumps	9,000.00
Complete excavation at Inclined shaft	7,500.00
Erect Headframe and Bins at Inclined Shaft	6,300.00
Repair Headframe at Vertical Shaft & Install Hoist	1,500.00
Complete Shop, Changeroom, and Warehouse	15,000.00
Equipment Rental and Purchases	2,600.00
Insurance and Taxes	1,975.00
Total	$ 61,875.00

From September on to December the balance of the money will be spent in approximately equal monthly installments of about $ 17,300.00.

BANNER MINING COMPANY
BALANCE SHEET
MARCH 31, 1951

ASSETS

CURRENT			
Cash in Banks		$ 32,801.97	
Cash Deposits		660.00	
Accounts Receivable		65,817.57	$ 99,279.54
INVENTORIES			
Mine and Mill Supplies			46,500.00
FIXED			
Automobiles and Trucks	$ 22,102.98		
Furniture - Office Equipment	10,864.30		
Mine and Mill Plant and Equipment	347,885.17		
Oil Lease Equipment (New Casing)	39,345.93 ?		
	420,198.38		
Less Depreciation Reserve	319,740.05	100,458.33	
Mining Claims (Cost)	275,354.70		
Mining Claims (Development Cost)	254,946.22		
	530,300.92		
Less Depletion Reserve	357,330.76	172,970.16	
Oil and Gas Leases (Cost)	24,301.77		
Oil and Gas Leases (Schedule Att'd)	204,962.50		
Oil and Gas Royalty (Cost)	56,209.76		
Oil and Gas Royalty (Schedule Att'd)	73,560.00		
Oil Payment (Cost)	3,114.00		
Oil Investment - Joint Venture	15,914.16	378,062.19	
Real Estate (Unimproved)		2,108.27	
DEFERRED			
Contingent Accounts Receivable		17,648.29	671,247.23
TOTAL			$ 817,026.77

LIABILITIES

CURRENT			
Accounts Payable	1,504.01		
Notes Payable (First Nat'l Bank)	50,000.00		
Vouchers Payable	39,728.93	91,232.94	
DEFERRED			
Reserve for Taxes		7,901.32	99,134.26
CAPITAL AND SURPLUS			
Capital Stock (Common) Issued		241,528.00	
Surplus (Capital)	78,877.50		
Surplus (Earned)	397,487.01	476,364.51	717,892.51
TOTAL			$817,026.77

Treasurer

BANNER MINING COMPANY

SCHEDULE

OIL AND GAS LEASES AND ROYALTIES - APPRECIATED VALUES

OIL LEASE - WORKING INTEREST

Garvin County, Oklahoma

Lease consists of 145 acres which has been communitized with surrounding leases of other owners, thus creating lease block of 240 acres, which lease block is divided into 6 units of 40 acres each. One well has been completed on Unit #1 and one well has been completed on Unit #2, both of which are producing wells. Four wells are yet to be drilled, one on each of remainig four units.

March, 1951, Production (Gross)	2,976 bbls	$7,488.79	
March, 1951, Production, Banner	735 bbls	1,851.77	
Ultimate Estimated Recovery of Two Producing Wells - 80 Acres @ 6000 bbls. per acre	480,000 bbls	$1272,000.00	
Banner Share of Ultimate Recovery		409,925.00	
Estimated present Sales Value Banner Interest based on Ultimate Recovery - 50% of $409,925.00			$ 204,962.50

OIL ROYALTY

Grayson County, Texas

Undivided 3/16 Royalty Interest or 82.08 Royalty Acres under 437.785 Acre tract of land covered by two leases:			
1. Magnolia Petroleum Co.	264.785 acres		
2. Duncan and Howell	173. acres		
One completed producing well on lease 2. Banner present monthly income		$ 270.00	
Present market value of royalty is $750.00 per acre. Value of Banner Interest (82.08 acres)			61,560.00

Beckham County, Oklahoma

Undivided 4 acres royalty interest (Producing)			
Banner present monthly income		112.00	
Present market value of royalty is $3,000.00 per acre.			
Value of Banner Interest (4 acres)			12,000.00
			$73,560.00

BANNER MINING COMPANY

OPERATING STATEMENT

JANUARY 1, 1951 TO MARCH 31, 1951

MINING OPERATIONS

INCOME			
Concentrate Ore Sales		$153,883.05	
OPERATING COSTS			
Mining	$127,596.92		
Milling	21,879.43		
Smelting and Freight	18,242.63		
Mine Development	23,658.12		
Depreciation (Estimated)	4,050.00	195,427.10	
GROSS PROFIT - MINING			($41,544.05)

OIL OPERATIONS

INCOME			
Royalty Oil and Gas Sales	$ 444.47		
Working Interest - Oil Sales	7,859.46		
Oil Lease Rental Receipts	163.17	8,467.10	
OPERATING COSTS			
Production Costs	426.11		
Lease Rentals Paid	360.50	786.61	
GROSS PROFIT - OIL			7,680.49
COMBINED GROSS PROFIT			($33,863.56)

OTHER COSTS

Administrative	19,065.30	
Taxes Paid	13,843.30	
Contributions - Gifts	20.00	32,928.60
COMBINED NET PROFIT		($66,792.16)

Form MF-100
(March 1951)

U. S. DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION

Form approved.
Budget Bureau No. 42-R1026.

GENERAL TECHNICAL DATA
FOR USE UNDER THE
DEFENSE PRODUCTION ACT OF 1950

NOT TO BE FILLED IN BY APPLICANT

Docket No. dma 269X-A

Date received 5-26-51

Banner Mining Company
Mineral Hill Mine
2042 Conner Stravenue,
Tucson, Arizona

Name and address of applicant

Date May 16, 1951

INSTRUCTIONS

This form is to be filed with Defense Minerals Administration, Department of the Interior, Washington 25, D. C. It should be accompanied by appropriate application form when a specific type of Government assistance is requested, in the form of (1) loan, (2) purchase contract, (3) Government guarantee of a private loan, (4) ~~Necessity Certificate pursuant to the provisions of Sec. [illegible] (amended) [illegible]~~ priorities or allocation of mining equipment, and maintenance, repair and operating supplies, and (6) other forms of Government assistance that might arise under the Act. Submit four (4) signed copies of the form and accompanying papers. Name and address should be stamped or typed on each sheet of this form and all accompanying papers. *When a question is inapplicable it should be so stated on the form.* Additional sheets may be attached in answering any questions or in supplying additional information. (IF YOU CANNOT ANSWER A QUESTION, SO STATE.) If a question is answered elsewhere indicate where answered. It is not necessary to answer it again.

5 GENERAL TECHNICAL DATA

Supply the following information on separate sheets, arranged, numbered, and lettered as indicated:

1. Materials produced:
   (*a*) What are the chief mine, mill, or smelter products? Copper when mine last operated.
   (*b*) What are the byproducts, if any? Small amount of silver.
2. Name(s) and type(s) of mine(s), mill(s), smelter(s), refinery(ies), pit(s), quarry (ies), drilling operation(s). Include old names of property, if any. Show extent of workings, including the following:
   (*a*) Linear feet of shafts. See attached sheets
   (*b*) Linear feet of drifts and crosscuts. See attached sheets
   (*c*) Linear feet of tunnels or adits. See attached sheets
   (*d*) Linear feet of other mine openings (explain briefly). See attached sheets
   Indicate whether mine is flooded or not. Describe any pumping problems. Give size or productive capacity.
3. For each operation listed above supply the following:
   (*a*) Distance and direction from nearest town and shipping point. See attached sheets
   (*b*) Mining district. See attached sheets
   (*c*) Township, Section, Range. See attached sheets
   (*d*) County, State. See attached sheets
4. (*a*) State whether or not property is now in operation, and if in operation, by whom operated. See attached sheets
   (*b*) Are you operating this property as:
   ☐ Owner.
   ☐ Lessee. See attached sheets
   ☐ Contractor.
5. Number of years in production July 1915 to June 1917
   If not in production or operation, estimated date when production will begin February 1951
6. Experience of operators:
   Describe the mining and general business experience of (*a*) the applicant, and (*b*) the person or persons who manage the project. See attached sheets
7. History:
   (*a*) Give a statement, as complete as possible, of previous exploration, development, operation, and production of property, with reasons for suspension of operation. See attached sheets
   (*b*) State briefly the known history and production of adjoining and neighboring properties. See attached sheets
   (*c*) Furnish any available (private) reports that may apply to this application, including results of mine examinations, recommended exploration and development, and metallurgical investigations. See attached sheets

16—63792-1

8. Names and addresses of Officers, Directors, or Partners, and in addition thereto, the five largest stockholders if applicant is a corporation.

Name and Address (a)	Official Title (If officer is also director indicate by "D") (b)	Total of Annual Salary, Commissions, Bonuses, Etc., Received From Applicant and Affiliates During Last Fiscal Year (c)	Estimated Net Worth Outside of Interest in Applicant (d)	Number of Shares Held in Applicant Corporation: Common (e)	Number of Shares Held in Applicant Corporation: Preferred (f)	Life Insurance Carried for Benefit of Applicant: Amount (g)	Life Insurance Carried for Benefit of Applicant: Net Cash Surrender Value After Loans (h)
** H.I.Grimes Oklahoma City, Oklahoma	President "D"	6,100	100,000	101,570	-0-	-0-	-0-
** E.S.Bowman Lordsburg, New Mexico	1st Vice-Pres "D"	8,650	25,000	11,000	-0-	-0-	-0-
Garnett, R.E. Oklahoma City, Oklahoma	2nd Vice-Pres. "D"	-0-	25,000	1,650	-0-	-0-	-0-
W.H.Hardy Oklahoma City, Oklahoma	Sect.-Treas. "D"	6,000	10,000	2,000	-0-	-0-	-0-
** L.L.Travis Dallas, Texas.	"D"	-0-	50,000	10,000	-0-	-0-	-0-
** Mrs. Ruth Wallace Waterloo, Iowa				17,300	-0-	-0-	-0-
** W.S.Bellows Houston, Texas.				8,000	-0-	-0-	-0-
** Five Largest Stockholders	Total	20,750	x x x x x	126,220	-0-	x x x x x	x x x x x

If more lines are needed continue on separate sheet.

9. Capital Stock Issues:

For Corporate Applicants

Item	Authorized (a)	Outstanding (b)	Par Value (c)	Number of Shares Outstanding (d)	Dividend Rate Last Paid* (e)
Common stock	$ 500,000	$ 241,528	$ 1.00	241,528	10%
Preferred stock	$ -0-	$ -0-	$ -0-	-0-	-0-

*Indicate period covered.

10. Production:

Item	Kind of Product (a)	1948 Total (b)	1949 Total (c)	1950 Total (d)	Present Average Monthly (e)
1. Quantity of product mined or quarried (Short, long, metric tons; barrels; pounds; etc.)		None	None	None	None
2. Quantity of product processed (specify unit of measure and type of process)		None	None	None	None
3. Quantity and grade of product sold or shipped (specify units of measure)		None	None	None	None

11. Do you contemplate a change in the present average monthly rate of production? If so, state estimated maximum monthly production and basis of change. Not until mine is unwatered, examined, and made ready for production.

12. Ore or Mineral Reserves:

(a) Describe the ore or mineral deposit briefly. Accompany the application by any available report on the geology and ore reserves. See attached sheets.

(b) If deposit is other than placer:

(1) Submit assay plans and/or sections showing location and size of proved (measured) and probable (indicated) ore or mineral reserve. See attached sheets.

(2) State the tonnage (indicate type of ton) and grade of each class of ore reserve, as above, and show how computed. Tabulated total ore reserve as follows: See attached sheets.

TOTAL ORE OR MINERAL RESERVES

Ore or Mineral Reserve	Estimated Tons (a)	Metal or Mineral Content Per Ton (Grade) (b)	Gross Value Per Ton (c)	Recoverable Unit Value Per Ton (d)	Estimated Cost of Production Per Ton (e)
Measured (proved)					
Indicated (probable)					

(c) If placer:

(1) Give estimated total yardage and average marketable mineral content of each deposit. Not applicable

(2) Submit map showing location of placer deposit and surrounding area, with all test holes or pits. Submit logs of each hole and test pit with depth and average value of each. Not applicable

(3) Describe gravel, stating whether fine, medium or coarse; loose, tight, cemented, or frozen, and whether it contains stumps or boulders more than 1 foot in diameter; if so, how large, and in what proportion.

(4) Describe bedrock, giving type (granite, sandstone, shale, etc.) and state whether it is hard or soft, smooth, uneven or rough. Not applicable

(5) Describe overburden, stating whether loose, tight, or cemented; fine or coarse textured; furnish estimate of average thickness and total amount. Not applicable

(6) Tabulate the reserves using the form outlined above for ore or mineral reserves. Not applicable

13. Access Roads:

Give road distances to shipping, supply and residence points, stating kind and condition of roads See attached sheets.

14. Water Supply:

State source and quantity of water available for operations and whether sufficient for all seasons of year.

See attached sheets

15. Power:

State amount of power used, rate per hour, and source thereof. See attached sheets.

16. Labor:

State number and classes (miners, muckers, millmen, etc.) of men employed during a recent representative payroll period.

See attached sheets

17. Equipment and Facilities:

Describe present equipment on the property, including buildings. (State condition.) List major pieces of equipment now owned or controlled and in serviceable condition available for this operation. See attached sheets

18. Are there any particular conditions or circumstances affecting your operations that are not described above? If so, explain.

See attached sheets.

CERTIFICATION

The undersigned company, and the official executing this certification on its behalf, hereby certify that the information contained in this form and accompanying papers is correct and complete to the best of their knowledge and belief.

Banner Mining Company
(Name of company)

By [signature]
(Signature of authorized official)

May 16, 1951
(Date)

President
(Title)

Title 18, U. S. Code (Crimes), Section 1001, makes it a criminal offense to make a willfully false statement or representation to any department or agency of the United States as to any matter within its jurisdiction.

U. S. GOVERNMENT PRINTING OFFICE 16—63792-1

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED

MAY 26 1951

LANDON F. STROBEL
Executive Secretary

Banner Mining Company Mineral Hill Mine

2042 Conner Stravenue Tucson, Arizona

D.M.A. Docket Number 269 MP-100

Question 1

(a) This is to be an exploration project in search of copper ores. The mine at present is being prepared for unwatering.

(b) None - Some Molybdenite has been noted in the ore.

Question 2

Mineral Hill Mine - Underground Mine.

(a) Number 1 Shaft - 200 Feet, Number 2 Shaft 520 Feet, Inclined Shaft 700 feet - Total 1420 Feet.

(b) About 5,500 feet of drifts and cross-cuts.

(c) About 200 Feet of Adits.

(d) About 800 feet of Raises and considerable stoping above the 300 level. Mine is at present flooded below the 235 foot level of the vertical shaft. Mine made about 250 gallons of water per minute according to the old mine records. We feel that the mine should be able to produce at the rate of at least 200 tons of 3.4% copper ores daily.

Question 3

(a) Mineral Hill Mine is 8 miles west of the town of Sahuarita which is also the nearest shipping point. It is on the Southern Pacific Railroad. The Mine is 15 miles South of Tucson, Arizona.

(b) Pima Mining District.

(c) This mine is located in Section 2, Township 17 South, Range 12 East GSRM and in Section 35, Township 16 South, Range 12 East GSRM.

(d) Pima County, Arizona.

Question 4

(a) Property is not now in operation, but is being prepared for unwatering.

(b) Lessee

Question 6

(a) Banner Mining Company has operated the Bonney and Miser's Chest Mines at Lordsburg, New Mexico together with its 500 ton Flotation Mill at the same location since 1935. During this period we have mined and milled a total of about 1,700,000 tons of low grade copper ores with a copper content in excess of 35,000,000 pounds.

(b) A. B. Bowman will be Superintendent of the Arizona operations. He has been Superintendent of our Lordsburg Plant since 1945. He has been connected with the Company at Lordsburg since 1936, starting as engineer.

Question 7

(a) Considerable oxidized copper ores were undoubtedly shipped prior to World War I, but no records are available. The Barnsdall Mining Company, a subsidiary of Barnsdall Oil Company, reports that 46,631 tons of ore were shipped during the period July 1915 to June 1917 which averaged 3.80% Copper and 0.77 ounces of Silver per ton.

From July 1917 through 1920 operations of the Barnsdall Mining Company were confined to exploration and development work. According to the Manager, F. H. Minard and Superintendent L. A. Fritchie they blocked out close to 500,000 tons of ore which would assay between 3 and 4% copper. Between $250,000.00 and $300,000.00 wer expended on this work.

A change in Company policy in 1920 caused the closing of all Barnsdall Mines, to devote their future energies to oil.

(b) The San Xavier Mine of the Eagle Picher Company is located one mile South of Mineral Hill. It is reported they are mining and milling in excess of 300 tons per day of Lead, Zinc, Copper Ores.

(c) A geological report by Dr. Harrison Schmitt together with Mine Level and Assay Maps and Claim Map were furnished with our original application D.M.A. Docket Number 269.

Question 12

The mine has not operated since 1920 and is under water below the 235 foot mark.

(a) The ore is chiefly chalcopyrite associated with pyrite in a garnet gangue and is probably related to the intrusive granite. It is localized along an east-west fault zone.

(b) All available maps and Assay Maps were submitted with original

Question 12 Part (b) Continued

application D.M.A. Docket Number 269.

... A. Fritchie, Superintendent, and F. H. Minard, Manager of Barnsdall Mining Company during its operation up to 1921 set the ore reserves at close to 500,000 tons of ore averaging 3 and 4% Copper.

Dr. Harrison Schmitt estimates from old Company Assay maps, level maps, and reports that 225,000 tons are available, under certain conditions, which will average about 3.4% copper.

A Geological report on this mine was submitted along with the original application Docket D.M.A. Number 269. Please refer to this.

Question 13

It is 8 miles over improved gravel roads to Sahuarita the shipping point on the Southern Pacific Railroad. No steep grades are involved.

The Mine is 16 miles South of Tucson Arizona where most supplies will be obtained and where the men will live. 11½ miles of this total is hard surfaced roads in good condition. The other 5½ miles is improved graded road in good condition. No steep grades are involved.

Question 14

The mine records during the time it was operated up to 1920 show that the mine made approximately 250 gallons of water per minute. The present water level is 235' below the collar of Number 2 Vertical Shaft. The mine makes sufficient water for a 300 ton mill. The San Xavier Mine of the Eagle Picher Company, located one mile south, has offered us the necessary water for use in commencing operations.

Question 15

The Trico Electric Company is making available on September 1, 1951 300 KVA of power for this project at the following rates: $1.75 per month per KW of billing demand, plus 2.0¢ per KWH for the first 50 KWH; 1.5¢ per KWH for the next 100 KWH; and .8¢ per KWH for all remaining KWH used per month.

Question 16

We have had an average of five miners employed doing preparatory work since January 1951.

Question 17

We have built a 30' x 50' wood frame, galvanized iron clad building which is now serving as a warehouse and temporary shop and office. This building has a cement floor.

We have a 445 cubic foot Gardner Denver Compressor driven by a D13000 Caterpillar Diesel Engine installed near the Vertical Shaft. This machine is rented and is in excellent condition. This unit is complete with a receiver.

We also have a 1940 GMC 3/4 ton pick-up truck and a Diamond T Flat Rack Winch truck on the property which are in good condition.

We also have a new Essick Gasoline Motor driven Concrete Mixer.

A 25 foot headframe has been erected over the Vertical Shaft, but will need a sheave wheel and repairs to make it serviceable.

Question 18

Nothing further to add. For further information see our application form MF-103 covering the Mineral Hill Mine, and D.M.A. Docket Number 269.

THE MINERAL HILL CAMP

Pima County
Arizona

Harrison Schmitt

January, 1951

HARRISON SCHMITT
Mining Geologist
Cottage Sanatorium Road
Silver City, N. M.

January 23, 1951

To: Allan B. Bowman, Assistant General Manager
Banner Mining Company
Box 482
Lordsburg, New Mexico

From: Harrison Schmitt

Subject: Mineral Hill Camp,
Pima Mining District,
Pima County, Arizona.

References: Reports and maps of Mineral Hill Consolidated Copper Company (Subsidiary to Barnsdall Corporation) 1915-1920. Claim map by Banner Mining Company.

Geography and Climate

The Mineral Hill district is about 16 miles south of Tucson, 8 miles west of Sahuarita, Arizona and one mile north of the San Xavier Zinc mine of the Eagle Pitcher Company. The area of the mines is marked by two isolated buttes surrounded by flat country which slopes gently eastward toward the Santa Cruz Valley. The area supports a desert or semi-arid flora typical of this part of Arizona. The mean altitude is about 3400 feet. The mean annual rainfall is probably around 10 inches. The summers are hot, but the winter seasons are mild and invigorating.

History

The camp doubtless produced oxidized copper ore previous to World War I. The Barnsdall Mining Company of Delaware reports that the Mineral Hill Consolidated Copper Company, an early subsidiary of the Barnsdall Corporation, in 1915-1917 shipped 46,631 tons of ore which netted (before mining costs) $433,913 or an average of $9.30 per ton. From 1917-1920 this company spent

$250,000 to $300,000 on development work. This work reached a depth of 700 feet and resulting in the blocking out of an apparently large volume of garnet - chalcopyrite ore the average assay of which is about 3.35% Cu. The mine was shut down in 1920 and has been idle since.

At the present time the Banner Mining Company has started to rehabilitate and to unwater the mine. The water level is approximately 250 ft. below the collar of the No. 2 shaft.

Control and Claims

The Banner Mining Company has a sub-lease and option on the property and has checked the titles and surveyed the claims. About 700 acres is controlled as a compact and adequate block of ground. The apex of the main lode is on the Banes and Copper Hill claims and on claims farther east which are also controlled by the company. The total length of apex controlled on the main lode is about 5500 ft.

The Development

The workings of immediate interest are on the Barnes and Copper Hill patented claims. There are four main shafts: Nos. 1 to 3 vertical shafts and the inclined Minard shaft. The No. 1 shaft serves extensive shallow workings in the oxidized zone, the No. 2 serves the 1st to 6th levels in oxidized and sulphide zones. The inclined shaft extends to a 7th about which not much is known. Presumably this level has not been extended far beyond the shaft station. The No. 3 shaft is about 600 east of the No. 2 and exploits a different ore shoot.

General Geology

Few early data on the geology of the area appear to be available. I spent two days on a reconnaissance of the surface geology and mineralization, and the geology revealed by the few shallow accessible workings.

The outcropping country rock is largely bleached limestone and shaly limestone with extensive areas of quartzite in the northern part of the property. Quartzite is prominent particularly on the buttes north and northwest of the mine. A coarse granite is exposed in one small area. All these rocks have been greatly disturbed and metamorphosed. There has been much faulting, folding and brecciation, and extensive areas or blocks, particularly of limestone, have undergone heat metamorphism and/or pyrometasomatism (i.e. so-called contact metamorphism). This has resulted in the development of extensive blocks of garnet and hornfels. Similar sedimentary rocks exposed at the San Xavier mine are said to be Permian in age. The granite is said to be of Cretaceous age in part and so may be intrusive into the limestone and quartzite. The granite is composed mainly of coarse quartz and orthoclase (?), and it is locally replaced by quartz and pegmatite.

Structural Geology

The bedding of the sedimentary rock varies in dip from 0 to 90°. It is likely to be overturned in places. A thrust fault is known from deep drilling at the San Xavier Zinc mine and is said to outcrop north of the buttes at Mineral Hill. The granite, in the vicinity of the mine, judging by the various reports is much more prominent underground than at the surface. A large pre-ore fault or fault-zone bearing east-west passes through the main workings. This fault dips south 55 degrees at the surface, but appears to flatten to about 30 degrees on the 5th and 6th levels. In general the hanging wall is composed of limestone, shaly limestone and garnet; the foot-wall of granite and quartzite. In other words the fault zone marks the "contact" so often mentioned in the old reports. This fault can be traced on the surface from the entrance of the No. 1 level inclined adit to 60 ft. north of the No. 1 shaft, thence over the hill and down to the east to just north of No. 3 shaft where it is exposed in the old surface stopes and near surface workings. It

doubtless continues eastward in the vicinity of the workings seen in that direction. To the west, 100 ft. northwest of the No. 1 shaft, it is cut-off by a N50E, 48°SE fault probably also of pre-ore age. This latter fault, judging by the written discussion of the development work, can be traced down through the 5th and 6th levels. It throws the "contact" fault ± 150 ft. northeast in the northwest wall. This throw can be seen on the surface and the "contact" fault can again be followed west for several hundred feet when it is again faulted, but this time thrown southwest. The first throw mentioned can be plotted underground by means of the old reports. On the 6th level the cross-fault is over 100 ft. wide. Probably a regional thrust fault will be found at a relatively shallow depth if it has not already been exposed by the workings.

Mineralization

The mineralization associated with the ore forming period is the contact pyrometasomatic type (popularly called the contact metamorphic type). This mineralization is probably directly or indirectly related to intrusive granite. The limestone has been extensively marbleized and locally, in broken ground, garnetized. Light and dark garnet seem to be the chief introduced silicates. There is a moderate amount of chlorite. The primary ore minerals are chiefly pyrite and chalcopyrite. These appear to be later than the garnet. They replace the garnet and follow fissures which cut the garnet. In the oxidized zone much of the ore is oxidized copper carbonates with garnet gangue.

The alteration of the granite includes replacement by the minerals chlorite and quartz. In places the quartz appears to be younger than the garnet.

Localization of Ore

The ore mineralization developed to date appears to be localized by the east-west pre-ore fault zone previously described. There is some evidence

that the shoots are localized in detail by the intersection of cross-faults and fault zones (tear faults?) with the main fault. The No. 1 ore shoot, for example, lies along the intersection of a major cross-fault zone with the main fault zone although it perhaps is not proved that the cross-fault is pre-ore.

The main fault appears to flatten in depth and the ore follows this flattening. Intrusive granite may have some control over the ore. The ore is largely found in garnetized limestone and presumably certain beds are more favorable than others.

The possible effect of a regional thrust fault or faulting on the local geology was not observed and deserves further study.

Ore Reserves

The data available for an estimate of ore reserves are fairly good for the lower levels particularly the 5th and 6th levels, but inadequate for the upper levels and especially for the oxidized zone. A number of photostat copies of level assay plans are available. Some of these are difficult to read and of course there is no way of telling whether or not they are up to date. The old mine reports, however, and the lack of activity since they were written, indicates that most of the ore developed during the 1917-1920 period is in place, at least on the 5th and 6th levels.

The best known ore shoot (No. 1 shoot) outcrops in the vicinity of the No. 1 shaft and dips south along the main localizing fault. It passes through the 4th, 5th and 6th levels 200 to 300 ft. west of the No. 2 shaft. The east and west or strike length is around 300 ft. Just west of this shoot and the large cross fault the west 6th level workings seem to have entered a new shoot (No. 2 shoot). At the No. 3 shaft there appears to be a third shoot (No. 3 shoot) of which little is known, but which produced some shipping ore.

The assay plan of the 3rd level is of little use until the level can be inspected. The extent and character of the ground represented by the assays

is not apparent. The ore may or may not remain in place and may or may not be oxidized. No record of a 4th level is available to me. The assay plans of the 5th and 6th levels have been photostated and at the same time reduced. The scale is known, but it is difficult to decipher many of the assays. Nevertheless, in conjunction with the mine reports, a fair idea of conditions can be had. The ore in the 5th level is pod-like in horizontal section. The total horizontal section of ore exposed amounts to around 6000 sq. ft. or 600 tons per vertical foot. According to the assays shown on the map this averages 3.0% Cu. Normal 10 per cent dilution would bring this down to 2.70% Cu, but perhaps this can be offset by clean mining and sorting. According to the old reports low grade waste can be picked out of the ore. There should be little or no dilution from the walls because of the bulky form of the shoots. In vertical section the 5th level ore bodies may be pod-like also, or the various exposures may extend up and down the dip in chimney-like forms. In the first case development and mining would be more expensive, but in either case the tons per vertical foot should be the same.

Most of the 6th level known ore is in a shoot which in horizontal section appears to have the form of a U elongated in the strike direction and open to the west or possibly it merely represents two unconnected beds. In horizontal section the area developed, if horizontal continuity is assumed between the three cross-cuts, is 15,000 sq. ft., i.e., 1500 tons per vertical foot. The average grade, using the assays shown, is 3.50% Cu. This possibly can be raised slightly by selective mining or lowered should it be desirable to raise the tonnage by breaking some of the lower grade in the edges of the stopes. There are a few smaller pods of ore, but not much can be made out about them.

The main shoot is exposed by three hanging wall cross-cuts averaging about 85 ft. apart. Whether the ore is continuous between these remains to be seen. The cross-cuts may have followed mineralized north-south fractures. The

reports suggest, however, that the ore followed east-west bedding which was crossed by the cross-cuts and if this is the case the argument for continuity between the cross-cuts is strong.

Little is known about extension of the ore body up and down the dip, but it would be pure accident if the shoot were elongated along the level as a pod-like form. It seems fair, then, to assume 100 ft. of vertical extension. This then would amount to 150,000 tons. Added to the 60,000 tons of estimated ore in the 5th level and for 100 ft. vertically we have a total of 210,000 tons which averages 3.35% Cu. Reduced 10 per cent for dilution this is 3.00% Cu. Under the circumstances this ore should be put largely in probable and geologically prospective categories.

High grade ore in the No. 2 ore shoot was cut in the west end of the 6th level. The grade exceeds 6% Cu. The width on the level normal to the strike of the bedding is 30 ft. which is the average for the main ore body. It is possible that the northeast fault, which separates this ore from the main ore body, is largely post-ore. In this case this ore would be the faulted off segment of the foot-wall "bed" of the main ore and the hanging wall "bed" should lie in the hanging wall. We fairly may assign 10,000 tons of probable ore to this exposure.

There is also some good grade ore reported in what was called 61E Raise. This appears to average around 4.0% Cu. We fairly may assign 5,000 tons of probable ore to this area. Some of the ore encountered seems to have been narrow high-grade pods and lenses along the "contact" fault (?).

Suggested Development

The No. 1 or main ore shoot should of course be tested in depth on the 7th level and further in depth if it can be followed. This type of ore should persist in depth if structural and wall rock conditions remain the same. The shoot may flatten still more as it dips south.

The 6th level should be extended to find the western limit of the No. 2 shoot and presumably also this shoot should be developed by the 5th level. Cross-cuts will be needed in the hanging wall.

The No. 3 shoot at the No. 3 shaft can be developed from the No. 2 shaft, but first probably preliminary drilling should be done.

Before extended development work is begun, a 100 scale, 10 ft. contour, surface topographic and geologic map and underground geologic maps should be made by a competent geologist. These will be needed to guide the surface drilling and underground development.

Mining

Much of the ground is strong limestone, garnet, quartzite and unaltered granite that stands without timber. But some of the ore, some of the altered granite, and some of the fault zones is heavy, at least when wet, and requires timber. Whether the ore that is heavy when wet will stand without timber when dry remains to be seen, but experience with this type of ore indicates that drainage will greatly improve its strength. This aspect of the ore is obviously critical cost-wise, but apparently is a matter that cannot be determined without unwatering, drainage and trial.

Milling

The Mineral Hill primary sulphide ore should give excellent recoveries say over 90 per cent, but, because of the abundant pyrite, may give low grade concentrates. The smelters, however, may want iron sulphide and accordingly reduce the smelting charges.

Costs

It seems futile to try to estimate costs when there are so many unknown factors. The most uncertain ones are the shape and the extension of the ore bodies. This has an intimate bearing on the method of mining that will be

required. Also critical is the question as to whether the ore, or most of it at least, will stand without timber.

Water for Milling

The mine when under development required a 250 g.p.m. pump but it is reported that it was difficult to control the water at the time the property was shut down. What the steady flow would be without development work is problematical. The mine when operating, however, will presumably always be under development. In this case there should be adequate water for a 300 ton mill.

Power

I am advised that both Federal and private sources of electric power will be available in sufficient supply from local power lines. A transformer station will be needed.

SUMMARY

The Mineral Hill mine appears to contain probable and geologically prospective ore reserves which exceed 200,000 tons of 3.35% Cu, or 3.00% Cu. if reduced by 10% for stoping dilution. Apparently a slightly higher grade of ore say 3.75% Cu. but lesser in tonnage could be produced by means of selective mining and sorting. Past experience with this kind of ore, the local geological setting and the fact that the ground is in inadequately prospected suggests that the probable and geologically prospective ore can fairly be estimated upwards to 500,000 tons. Estimates would have to be revised downward if the ore is not continuous between the hanging wall cross-cuts on the 6th level.

In any case the general aspect of the mine and possibilities for more ore along with the probability of a high price for copper for several years

or more makes the unwatering and inspection of the mine at this time an excellent risk. The preliminary gamble in funds needed to inspect the lower levels is well worth taking.

Yours very truly,

original signed
HARRISON SCHMITT

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cc: 1 file
3 extra

HARRISON SCHMITT
MINING GEOLOGIST
SILVER CITY, NEW MEXICO

February 9, 1951

To: Allan B. Bowman, Asst. General Manager
Banner Mining Company
Box 482
Lordsburg, New Mexico

From: Harrison Schmitt

Subject: Low-grade sulphide ore at Mineral Hill

The maps and records on Mineral Hill available to me do not indicate much low-grade ore; that is, ore in quantity of a grade, say, between 1.5 and 3.0 per cent copper. This does not mean that such ore does not exist, but at the time the mine was being developed, ore of such a grade was of little interest and would normally not be noted, much less searched for.

One of the old reports mentions that "No. 1 west drift X-cut" on the 5th level was in 2% ore for much of its course, a distance of perhaps 60 ft., but the Cu was in the form of chalcopyrite in fractures. On the 6th level "6-8-S" X-cut there is 50 ft. of 1.25% Cu according to the old assay map. Whether either of these "runs" of samples represent bulky or fissure ore is not clear. The "2 Contact drift" is reported to have been in 1% Cu for part of its length, and on the east side of the same level, 1-1/2 per cent ore and higher is recorded occurring as seams of chalcopyrite.

As is usually the case, then, it would seem that the chances are good that marginal ore of moderate tonnage, say up to 20% of the presently estimated reserves, is in place and can be mined provided the over-all economics are favorable.

Besides the low-grade ore the reports mention narrow ore of good grade along fissures.

Very truly yours,

Harrison Schmitt

Harrison Schmitt

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cc: 1 file
3 extra

HARRISON SCHMITT
MINING GEOLOGIST
SILVER CITY, NEW MEXICO

February 9, 1951

To: Allan B. Bowman, Asst. General Manager
Banner Mining Company
Box 482
Lordsburg, New Mexico

From: Harrison Schmitt

Subject: Plumed Knight mine and vicinity,
Mineral Hill Camp
Pima Mining District, Arizona

The Plumed Knight mine is about 1700 ft. S6SE for the No. 3 shaft of the Mineral Hill Camp. The mine is reported to have produced some high-grade oxidized copper ore but no production data are available to me.

The principal localizing fault of the Mineral Hill mine mentioned in my report of Jan. 23 appears to be the chief localizing "structure" of the ore at the Plumed Knight mine. Here the fault bears east-west and dips around 40 degrees south. There are moderate sized stopes along this fault. Some cross "structures" also seem to influence the localization of the ore.

The length of good outcrop mineralization in the vicinity of the Plumed Knight shafts extends for ±400 ft. and varies from several feet up to about 20 ft. in thickness. This outcrop is marked by minor gossan and low-grade oxidized copper ore. The walls including the footwall are limestone and minor quartzite.

The Plumed Knight ore shoot may be called Shoot No. 4 of the Mineral Hill area. Its size and importance are only obscurely known, but it is attractive enough to justify reopening of mine, though possibly this step should be preceded by diamond drill from the surface. The ground east of the Plumed Knight shaft for 1800 ft. is controled by the

Banner Mining Company.

North of the Plumed Knight shaft about 1500 ft. is an old smelter site with nearby shallow workings in limestone where oxidized copper ore has been produced. The size of the workings suggests that perhaps a minimum of 5000 tons of ore has been produced. The ore is along fractures of varying dip and strike and with widths of ore up to 5 ft. There is said to be some oxidized zinc ore in this vicinity.

There is good reason to believe that a major regional thrust fault lies at shallow depths in this area, say a depth of around 100 ft. and the ore may not persist in depth. The ground deserves further study and possibly shallow churn drilling and limited objective "gambicino exploration and mining is justified.

Yours very truly,

Harrison Schmitt

Harrison Schmitt

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MINERAL HILL PROPERTY

Pima County, Arizona

Banner Mining Company controls by means of a Sub Lease and Option the Mineral Hill and Plumed Knight Groups of Mining Claims in the Pima Mining District, about 16 miles south of Tucson, Arizona. These two properties comprise a total of 38 patented Mining Claims. Good roads connect these properties with Tucson, being oiled for eleven and one half miles. It is about nine miles from Mineral Hill to the Southern Pacific Railroad at Sahuarita, Arizona over good graded roads.

These properties were last operated by the Barnsdall Mining Company, a subsidiary of Barnsdall Oil Company in 1921. They were closed down at that time along with all Barnsdall Mining Company properties by a change in Company policy to get out of the Mining business and devote all time and energy to oil. (See Exhibit A.)

A total of 46,631.22 tons of ore were shipped from these properties to the Smelter of the American Smelting and Refining Company at El Paso during the period July 1915 to June 1917. The average grade of this ore was Silver 0.77 ounces per ton, and Copper - 3.80%. (See Exhibit A)

From 1917 to 1921 the Barnsdall Mining Company did a very substantial amount of development work on the Banes Claim totaling almost $ 300,000.00. A 500 foot two compartment vertical shaft was sunk together with an inclined shaft to the 700 foot level. The 400, 500, and 600 levels were all opened by drifting, cross-cutting and raising over a length of approximately 600 feet. The work they did on these levels was limited to development and exploration work only. It was the desire of the Barnsdall Mining Company to outline the orebodies in preparation for a concentration mill. According to letters of Mr. W. A. Fritchi, Superintendent, and a report by Mr. F. H. Minard, President of Barnsdall Mining Company in 1920, approximately 500,000 tons of copper ores averaging between 3% and 4% copper have been disclosed by the above development work. (See Exhibit F)

A copy of a letter from Mr. E. H. Dobbs, Vice President of Barnsdall Mining Company dated June 22, 1948 is attached hereto and marked Exhibit A. This letter relates to the amount of ore shipped and amount of development work completed.

These ore deposits are classed as contact metamorphic and lie on or near the contact of Granite and Limestone, which have been altered in places to marble. The sulphide ore from that seen on the dumps is massive pyrite containing chalcopyrite and bornite. The gangue mineral for the most part is garnet. The contact strikes roughly East-West and dips about 55° to the north.

The water level is reported to be about 250 feet below the collar of the No. 2 Vertical Shaft. From letters by Superintendent, Mr. W. A. Fritchi, the mine made about 250 gallons of water per minute on the 600 level. On account of the water and some timber being out we have not been able to examine the mine below the 100 foot level. However, all of the old records and maps point toward a very sizeable amount of ore that has been partially developed. (See Assay maps marked Exhibits B, C, and F. H. Minard Report marked Exhibit F.)

It is the purpose of the Banner Mining Company to unwater and rehabili both the 700 foot incline shaft and the 500 foot vertical two compartment shaft and to re-open some of the upper workings which may show some shippin

grade carbonate ores. This work should be done preparatory to actual mining. We believe from examination of the assay maps that there will be some shipping grade ore, but for the most part these ores will need the benefication of a flotation mill.

We have contacted the manager of the Eagle Picher Mill at Sahuarita, approximately eight miles away, with regard to milling some of the sulphide ores in the beginning of our operations. He advised me that they could probably handle up to 450 tons per week at regular rates or a total of 900 tons per week if we would pay the extra labor charges for work on Saturday. This is however, based on the fact that same is metallurgically possible after obtaining a good sample of the ores from underground. However, I do not think that we will encounter any milling difficulty as the ore is mainly chalcopyrite and bornite in silicious gangue containing garnet and heavy pyrite. Flotation tests were made on this ore in 1918 and 1919 at Columbia University. These tests showed that a recovery of between 90 and 95% could be made on the copper.

We have contacted the American Smelting and Refining Co. Smelter and asked for rates on this ore as they have smelted it direct in 1915 to 1917. It is a neutral self fluxing ore. They have given us a rate of $1.75 per ton for ore with a value of $15.00 or less and 15% of gross value of ores above $15.00. The present Railroad freight rate from Sahuarita to El Paso is $ 4.00 per ton.

Power is available from a Tucson Electric Substation at the Eagle Picher Mine less than a mile away.

No equipment or buildings of any nature are on the property and it will be necessary to start from scratch.

Banner Mining Company has at its plant in Lordsburg, New Mexico most of the equipment needed to get started on this project such as hoists up to 100 H.P., Electric Motors, Timbers, (for headframe and bins and mine repair), pipe and track, mine power cables, ore cars, signal and communications wiring and equipment. We do not have a portable compressor, but can arrange to rent a 365 cu.ft. Diesel Portable Compressor.

The following is an outline of proposed development work program together with estimated costs of doing same. This reopening and development program can possibly be completed in about one year and should put our company in position to commence the mining of 3% copper ores at the rate of 200 tons per day and should disclose close to 500,000 tons of ore with a metal content between 30 and 35 million poinds of copper. A start on production can be made after reopening the 4th. level.

COST ESTIMATE OF RE-OPENING PROGRAM

Mineral Hill Mine - Pima County, Arizona

(1)	44,000 Volt Power Line - Approximately one mile	$ 4,000.00 ?
(2)	Transformer Substation - 44,000 V to 440 V	16,000.00
(3)	Repair and Retimber where necessary 500' Vertical Shaft	17,500.00 ?
(4)	Repair, Retimber, and unwater 700 foot Incline Shaft	23,000.00
(5)	Excavation for Hoist Building, Installing Headframe and Hoist	7,500.00
(6)	Headframe and Bins at Incline Shaft	6,300.00
(7)	Headframe Repair and Hoist Installation at Vertical Shaft	1,500.00
(8)	Reopening, Retimbering if necessary bottom 3 levels- Approximately 3000 feet of drits, install pipes and track @ $7.00 per foot and 700 feet of Raises @ $ 10.00 per foot	28,000.00
(9)	Warehouse, Office, Changeroom, and Shop Buildings & Installation	25,000.00 ?
(10)	Equipment Rentals and Equipment Purchases not now owned by Banner Mining Company	3,500.00
(11)	Insurance, Social Security and Other Taxes	4,500.00
TOTAL		$ 136,800.00

We do not have any employees on the ground at this writing, but expect to commence work about January 1, 1951. However, it is intended to take some experienced men from the Lordsburg Operations under the following departments:- (1) Management (2) Mining, (3) Engineering, and (4) Shops to form a nucleus of the new organization at the property. We understand there is ample labor in Tucson and nearby towns.

The following maps, letters and reports are attached as part of this report to and in showing ore bodies, and other conditions at this property.

(1) Copy of a letter from E. H. Dobbs, Vice President of Barnsdall Mining Company in 1948 marked Exhibit A.
(2) Excerpts from letters by W. A. Fritchi, Superintendent, to F. H. Minard, Manager of Barnsdall Mining Company marked Exhibit B.
(3) Assay map of first three levels of the Mineral Hill Mine marked exhibit C.
(4) Assay map of the 5th. and 6th. levels marked Exhibit D.
(5) U.S.G.S. Topographic Map of Area marked Exhibit E.
(6) Claim map of area also shows adjoining property marked Exhibit F.
(7) Report by F. H. Minard, President of Barnsdall Mining Company and Report on Analysis of Barnsdall Oil Company as of December 1919 marked Exhibit G.
(8) Letter from T. N. Stevens, Registered Engineer regarding Mineral Hill Property marked Exhibit H.

Only a small portion of the property has been developed to any depth. There are numerous good showings of copper carbonate ore shoots on the surface for over a distance of at least 2,000 feet easterly from the vertical shaft on the Banes Claim. These surface showings have been explored, according to the best information available, to a depth in most cases of less than 300 feet. I feel that after the Mineral Hill mine has been reopened, a well directed exploration program at about the 600 level horizen to the east and south of the No. 2 Vertical Shaft on the Banes Claim wil open extensive new ore bodies. There are also many fractures in the limestone south and east of the Banes Claim which contan copper carbonate ore shoots.

We are submitting our application for a direct reopening, Exploration and Development program to be financed by the government. The program is to be in two parts; (1) Rehabilitation of the two shafts and unwatering of same together with the reopening of various drifts and cross-cuts down to and including the 600 level. We feel that to re-open this mine and to put it in good operation condition for a long period of production would help the country a great deal at this time. We are willing to use all of our available equipment which is applicable to the new operation and which will almost completely outfit it for the re-opening process plus personnel from our Lordsburg Plant to form the nucleus of the new organization. Our shops at the Lordsburg, New Mexico plant will be available at all times for repairs and maintenance. This re-opening process will take close to a year to complete, at which time we will be in a position to produce steadily at a rate of about 200 tons per day or more. (2) The second phase of this program will be production of ores and the development and exploration work to find new bodies by the extension of the 500 and 600 levels to the East and North out under favorable ore shoots and to open the Hanging Wall orebody on the 500 as has now been found on the 600 level; and also the necessary cross-cutting and drifting to prove up the ore on the 700 level, the incline shaft already being down to this point. This second phase is to be contingent upon successful conclusion of the first

phase. During the latter part of World war II we were given a development and exploration program with which we opened the Miser's Chest Mine here at Lordsburg. It has been producing at the rate of 200 tons per day for the past few years. A total of 240,000 tons has been produced from the Miser's Chest since 1945.

SECOND PHASE OF THE DEVELOPMENT AND EXPLORATION PROGRAM

500 Level	
950 Feet Cross-Cutting and Drifting at $27.00	$ 25,650.00
1500 Feed Diamond Drill Holes @ $ 4.00	6,000.00
600 LEVEL	
1000 Feet Cross-Cutting and Drifting @ $27.00	27,000.00
1500 Feet Diamond Drilling @ $ 4.00	6,000.00
700 LEVEL	
1600 Feet Cross-Cutting and Drifting @ $27.00	43,200.00
2000 Feed Diamond Drilling @ $ 4.00	8,000.00
250 Feet Raising @ $ 23.00	5,750.00
Machinery Purchase Schedule	11,760.00
GRAND TOTAL	$ 133,360.00

EQUIPMENT PURCHASE SCHEDULE FOR SECOND PHASE OF DEVELOPMENT AND EXPLORATION PROGRAM

Six (6) Drifter Machines	$ 5,100.00
Three (3) Mucking Machines	7,800.00
One (1) 800 Cubic Foot Compressor	13,000.00
Hoses and Connections for Machines	1,000.00
TOTAL	$ 26,900.00

Life of these machines - Five Years.
To be used Two years on this program.

Salvage Value at the end of Two Years	$ 17,140.00
COST APPLICABLE TO THE SECOND PHASE OF THE PROGRAM	$ 11,760.00

As to the copper we produce from the Mineral Hill Mine we feel we should receive a premium price above current market for this metal of about 5¢ per pound of contained copper to be able to make a fair profit under present inflated costs with mostly new personnel at least until our own mill will be completed.

We respectfully aoply for the above Development, Exploration and Reopening Program to be financed by the government and trust this application will receive your early consideration. If there is any further information you require, we will be glad to furnish same at your request. Respectfully submitted.

Banner Mining Company

By A. B. Bowman

A. B. Bowman,
Superintendent,
Lordsburg Mines

BARNSDALL MINING COMPANY OF DELAWARE
Subisdiary of Barnsdall Oil Company
Seneca, Missouri, U.S.A.

June 22, 1948

Mr. C. F. Phippen
309 North 4th. Street,
Boise, Idaho.

Dear Mr. Phippen,

Relative to the request for history of operations on our Mineral Hill and Plumed Knight properties.

In checking our files, I find that most of these maps and records have been forwarded. However, I do note from a letter I wrote sometime ago we listed detail of operations from July 1915 to June 1917 and are listing these as follows:-

Net Dry Tons (Smelter)			46,631.22 T.
Amount Recd. from Smelter			
Less Charges and Freight			$ 433,913.26
Average Per ton			9.30
Assay: Copper -			
	Lowest	2.82%	
	Highest	5.56%	
	Average	3.80%	
Silver -			
	Lowest	.50 oz	
	Highest	2.46 oz	
	Av. approx.	.77 oz.	
Prices: Copper			
	Low	16.07 Paid 13.57¢	
	High	27.00 Paid 22.87¢	
Average Freight and Treatment Charge			$ 4.75 per ton

Operations were shut down in July 1917 because the smelter advised they could not take any more ore. From this time on through 1920, operations were confined primarily to development work. This work is described in the Fritschie-Minard Letters. Some $250,000 to $300,000. was expended in this work, I believe. A change in Company policy in 1920 caused the closing of all the Barnsdall mines, their future energies being devoted to oil. The mines since that time have been in the process of liquidation as you are fully aware.

I believe you have been furnished with copies of all the maps that we have on these properties.

Yours very truly

BARNSDALL MINING CO. OF DEL.

s/ E. H. Dobbs
E. H. Dobbs
Vice President

EHD;pjm

C O P Y
EXHIBIT A

EXHIBIT B

EXCERPTS FROM LETTERS OF W. A. FRITCHI, SUPERINTENDENT, TO F. H. MINARD, MANAGER OF BARNSDALL MINING COMPANY WITH REGARD TO MINERAL HILL PROPERTY PIMA COUNTY, ARIZONA.

600 Level Station Started February 17, 1919

May 15, 1919

We will take more samples tomorrow and bring the work up to date. The 6-1-E raise has exposed a body of very fine shipping ore and if copper was around 25¢ we would surely help pay our expenses. This ore will sample at least 5 to 6%, and is of such a nature that it can be graded up by sorting.

June 23, 1919

I am pleased to state that I believe we now have the main ore body in the 600 W - 6-2-So X-Cut. We broke into a slip, running E & W with this afternoon's round and it is solid ore that will assay at least 4%.

July 27, 1919

From what work we have done to date in the West side of 6-2-S X-Cut, the ore now exposed shows a width of about 15 to 20 feet, and looks mighty fine.

October 2, 1919

The west end is looking very fine. The 6-8-So X-Cut is still in ore, but as the ore is very soft we have to timber close as we advance. It is now in 36 feet and all but 10 feet is in ore with ore still in the face. The 6-10-S X-Cut will be started tomorrow. The granite footwall in the west face is all shot full of ore, sulphides and looks very good. The 6-6-S X-Cut, which is now in 62 feet with the face still in ore looks very good also. We hit another flow of water in this face last night which had us guessing for awhile, but it was only a pocket and is gradually getting back to normal. From point of contact (granite) we have practically drifted through over 60 feet of ore in this cross-cut, with ore in the face today. The 6-2-S X-Cut is now in 140 feet from the footwall granite. The last round we blasted here went through the sulphides into a hard iron-garnet shot full of carbonates (oxidized ore). This type of garnet is always near the ore and is either the H.W. casing of the orebody we cut through, or, the beginning of a parallel body. (Hope my guess is correct) This last orebody we cut through is over 20 feet thick (measuring at right angles to slope of footwall of ore) and will run better than 3.5% copper figuring out widths of orebodies cut in this 6-2-S X-Cut, 2 bodies, first body 25 feet, 2nd. body 20 feet, we have cut through (measured at right angles to pitch of body). This width will check out very closely with the ore in the 6-6-So X-Cut which is 120 feet to the west of 6-2-S X-Cut.

I am very anxious to get the 6-10-S X-Cut going and when we cut the orebody at this point we will then have 200 feet in length and this is not taking into consideration that the ore extends to the east of 6-2-S where we found same. We now know it to be 200-225 feet long as already proven by 6-8-S X-Cut. The 6-10-S X-Cut will be 50 feet further west of 6-8-S X-Cut.

January 3, 1920

In the 6-2-S East Forks X-Cut we have hit the ore on the east side of the fault or on the east as well as the south side of the faults. This is very gratifying, for it proves the main orebody to be longer than we thought and opens the question of further x-cutting the hanging beyond the point of all of our east side x-cuts. The 6-2-S. E-forks x-cut, is in fine ore and looks very good. In a very few days, as we advance more into the ore, we will drift on it to the east for I am confident that it extends to and beyond, to the east of a point directly south of the face of the 6-1-S X-Cut.

January 17, 1920

The 6-2-S E forks X-Cut is in fine ore as is also the drift started to the east on this ore. These two places look mighty fine and surely add to our blocked out tonnage. We also started to drive the 6-1-S X-Cut today and I most confidentlylook for very good results to the south from this place.

January 28, 1920

I wired you today that we had hit the ore in the 6-1-S X-Cut and the 6-12-S X-Cut. The first is just entering the ore zone and looks very good, and as the 6-2-S E forks and the east drift off same are all in ore, there is no doubt whatever but that the main orebody extends to the east and still further east than the #1 crosscut. I do not think it is a good plan to drive the 6-5-S X-Cut just yet, or until I turn off to the east on the ore from the #1 cross cut. We are getting this east ground pretty well in hand now, and I am in favor of staying with the ore, doing all the work in ore, after which we can then drive the #5 to facilitate future handling.

The 6-12-S X-Cut is in the ore body and looks very good. It proves that the ore continues to the west of and beyond the big white lime body that cut off our ore in the 6-8-S X-Cut.

The 700 level looks good to me now and I am anxious to get at it.

February 2, 1920

All the 600 work is bearing fruit, and is more than encouraging and just a little more time and work will swell our tonnage beyond all expectations.

February 19, 1920

We are driving the 6-8-S X-Cut again, for since striking the ore in the east face from this X-Cut, it leads me to believe that we can expect good results to the South. The west drift off from the 6-12-S X-Cut has good ore, and I believe that we are on the main orebody to the west of the white lime body that cut our ore off.

February 27, 1920

An engineer from the engineering and geological staff of the Phelps Dodge Corporation at Bisbee, Arizona, called on us today and asked permission to see the mine. I have every reason to believe that Mr. Bishop had him come here to see us and to find out if we could ship them some sulphide

ores, of which they are in great need. (especially our neutral ores). I took him to the 500 and 600 levels and showed him what we had, and told him of the grades of ore in a general way etc., telling him that I had every reason to believe that we had close to 500,000 tons of concentrating ore in sight assuming that our present 600 orebodies extended down 50 feet below the level.

On leaving this afternoon, he asked me if the property was for sale or if we would entertain any proposition from the P.D. Corp. He also requested sketches of the levels, limits of the orebodies, assays, etc, which I refused him telling him to communicate with you.

We are hitting some ore in the east drift off from the end of the 6-8-S X-Cut. This east drift is way out in the hanging, far beyond the point of the end of the 6-6-S X-Cut, so this showing is encouraging. The more work we do out in the hanging, the better it looks and the probabilities are that with more cross-cutting to the south on the N-S Breaks and drifting on the E-W slips therefrom we will find other orebodies as large as those we have already blocked out. There are so many places we should and must drive, that at times I hardly know which to tackle first. The 600, in fact the whole mine looks bigger and better to me every day, and it wears on my nerves at times to have to keep pecking away with just a few machines, when we should have compressor capacity for a dozen machines, and have everyone of them driving and blocking new ore. I am positive that we can go up to the 500 level and cross-cut out into the hanging, in three places that I have in mind, and find the same H.W. orebodies that we have on the 600.

March 10, 1920

The face of the east drift off the end of the 6-8-S X-Cut is all in ore that will run 5% copper. Heretofore, the ore we drifted through some 80 feet long in the 6-8-S X-Cut was in what I call the contact orebody. I always believed that the H.W. orebody as we found it in the 6-2-S-X-Cut extended to the west as well as to the east. We have now proven that it does extend to the east as far as the 6-1-S and now that we have found it way back in the hanging in the 6-8-S X-Cut, we know that we have a whale of an orebody and our tonnage is increasing with leaps and bounds. The east drift off from 6-1-S is looking mighty promising, showing good ore scattered through the garnet. The west drift off from the 6-12-S X-Cut is showing high grade ore, and we are going to hit it big there any day now. We are hitting seams 3 to 6" wide in solid chalcopyrite. We can only work two machines on the 600 level as we are using 3 to 4 machines on the new shaft with the sinking and raising. We got along here for the past two years as best we know how, but now that we have developed a mine here I get anxious and nervous for I should be giving you better returns for money spent, but through no fault of your Sup't., the blame rests with our inadequate equipment, and that hurts.

MINERAL HILL CONSOLIDATED COPPER CO.

Incorporated under Laws of Arizona.

CAPITAL STOCK: Authorized—Preferred $200,000.00; Common $3,000,000.00. Outstanding—Preferred $200,000.00; Common $2,972,000.00.
Barnsdall Corporation owns 71%

DIRECTORS

Robt. Law, Jr. — Jas A. Dunn
F. H. Minard — W. D. Blackmer
E. B. Reeser

OFFICERS

F. H. Minard, President — E. O. Bartlett, Vice President
J. T. Furlong, Treasurer — Jas. A. Dunn, Secretary

The properties belonging to this company are in one of the best copper sections of the State of Arizona and are located in Pima County, twenty miles south of Tucson, at an elevation of 3500 ft. The climatic conditions are ideal and a railroad spur of 8 miles is all the track required to give through rail communication to all the southwestern smelters. There is plenty of water for all mining and milling purposes and Mexican labor is employed throughout the camp. The group consists of 55 claims, or about 1100 acres, a portion of which has already been patented. 37-3 Sat.

The company has carried on development work for a number of years which has reached a depth of 700 feet in the west end of the property. This work has explored only a small fraction of the property, but it has developed a body of copper ore carrying some precious metal values which will average between 3% and 4%, and many veins are found running as high as 10% and 12%. There are practically in sight 500,000 tons of this grade of ore and our development is constantly extending the size of the ore body both laterally and in depth.

There are several other shafts on the property from the workings of which ore has been shipped to the smelter and they will be developed just as soon as adequate machinery and power can be made available. All of these workings show the same grade of copper and development is expected to show large bodies of milling ore.

Negotiations are now under way to build the necessary 8 miles of railroad and plans are being drawn for the erection of a 300 ton concentrating mill, located directly on the property. It is expected to begin shipment of concentrates July 1st of this year and at the present price of copper the property will earn $250,000.00 a year net.

As the property is developed it is expected to add other units to the mill, thereby increasing the earnings very considerably. The property is a large one and there are many indications of ore bodies which have not yet been developed and the character of the deposits are of such a nature that it is fully expected that this property will be a steady producer for many years, as it has all the characteristics of the well known lime-stone ore bodies of Arizona.

F. H. MINARD,
President.

EXHIBIT — (6)

ANALYSIS OF PROPERTIES, INVESTMENTS AND ADVANCES OF BARNSDALL CORPORATION AND SUBSIDIARY COMPANIES

DECEMBER 31, 1919

	Number of shares owned	% of outstanding stock owned by Barnsdall Corporation	As carried in Consolidated Balance Sheet	Market or Fair Value
OIL AND GAS PROPERTIES:				
Barnsdall Oil Company		100%	$13,114,392.06	$15,000,000.00
Victor Oil Company		100%	321,667.56	3,000,000.00
Miscellaneous Oil and Gas Properties			234,205.73	250,000.00
Totals, Oil and Gas Properties			$13,670,265.35	$18,250,000.00
MINING PROPERTIES:				
Barnsdall Zinc Company		100%	$1,114,640.65	$5,000,000.00
American Tripoli Company		100%	256,429.72	500,000.00
Barnsdall Coal Company		100%	461,903.25	750,000.00
Miscellaneous Mining Properties			1,177,992.13	1,500,000.00
Totals, Mining Properties			$3,010,965.75	$7,750,000.00
REAL ESTATE AND MISCELLANEOUS PROPERTIES:			$351,486.01	$500,000.00
Total Properties			$17,032,717.11	$26,500,000.00
INVESTMENT IN SHARES OF OIL AND GAS COMPANIES:				
Potter Gas Company—Common	37,619	88.1%	$452,015.00	$3,761,900.00
Potter Gas Company—Preferred	3,303	60.2%	165,150.00	165,150.00
Pittsburgh Oil and Gas Company	332,770	66.5%	860,543.79	4,991,550.00
Imperial Osage Development Company	14,000	70%	300,000.00	300,000.00
Ashland Oil Company	84,390	84.4%	36,820.84	843,900.00
Moncton Tramways Electric & Gas Co., Ltd	7,052	62.7%	105,780.00	105,780.00
Miscellaneous Oil and Gas Securities			147,403.41	147,403.41
Total Investment in Shares of Oil and Gas Companies			$2,067,713.04	$10,315,683.41
INVESTMENT IN SHARES OF MINING AND MISCELLANEOUS COMPANIES:				
Mineral Hill Consolidated Copper Company—Common	2,070,962	69.7%	$ 590,364.60	$ 1,500,000.00
Mineral Hill Consolidated Copper Company—Preferred	194,010	97%		
Miscellaneous mining and other securities			138,268.50	1,000,000.00
Total Investment in Shares of Mining and Miscellaneous Companies			$ 728,633.10	$ 2,500,000.00
BONDS AND MORTGAGES OWNED			$ 279,986.09	$ 279,986.09
ADVANCES TO AFFILIATED COMPANIES			$1,426,006.21	$ 1,426,006.21
Total Investments in and Advances to Affiliated Companies			$4,502,338.44	$14,521,675.71
GRAND TOTAL OF PROPERTIES, INVESTMENTS, AND ADVANCES:			$21,535,055.55	$41,021,675.71

SURVEYS · MAPS

SUBDIVISIONS

T. N. STEVENS
REGISTERED ENGINEER
MINERAL SURVEYOR G L O.
PHONE 3044 514 N. PLUMER AVE
TUCSON, ARIZONA

May 30, 1948

Mr. D.A. Campbell
Gateway Gold & Copper Co.Inc.
317 Yates Bldg.
Boise, Idaho.

Dear Mr. Campbell;

Referring to your letter of May 24 I remember having a conversation with Mr. Chaffee last fall in connection with your Mineral Hill property near Tucson.

As to the ore dump; there is considerable dump at the main shaft which was made principally I believe from the early development work. From the amount of underground workings in the mine one would expect to find a much larger dump.

This is due to the fact that during the first World War a great amount of ore was shipped to El Paso from the upper workings . There is one stope in the mine 40 ft. or more in width and over 100 ft. high . This was all solid ore and practically all of it shipped to the smelter .

From 1918 to 1920 as I remember very little ore was shipped, if any. as during this period,the ore below the 300 ft. level was being blocked out in preparation for a mill which I understood the Barnsdall Corporation proposed to build but was never started.

There is a great deal of ore below the 300 ft. level which is blocked out and all ready to mine. This of course is now all below water level.

I would be glad to sample the dump or have the work done for you but I have my doubts if there is sufficient values to justify working same.

I am enclosing herewith a map of the district showing your property The cost of this data is $5.00

If there are any further questions you care to ask, do not hesitate to write me.

Trusting I will have the pleasure of meeting you sometime in the future , I am,

Most sincerely yours,

T.N. Stevens.

T.N. Stevens

I CERTIFY THAT THIS IS A TRUE AND EXACT PHOTO NEGATIVE OF THE ORIGINAL AND WAS MADE BY ME THIS 24 DAY OF nov 19 50

E. Garcia

Photostat Operator
R. M. METCALFE, INC.
EL PASO, TEXAS

SUBLEASE OF MINING PROPERTY AND OPTION

From: ANNE M. PHIPPEN and DANIEL KIRBY PHIPPEN and CHARLES C. CHAFFEE, Jr. and ANNE CHAFFEE, husband and wife, and EVERETT H. DOBBS and VERA L. DOBBS, husband and wife, as

OPTIONORS,

To

BANNER MINING COMPANY, a Nevada corporation, as

OPTIONEE

THIS SUBLEASE AND OPTION AGREEMENT, Made and entered into as of the first day of October, 1950, by and between ANNE M. PHIPPEN, the surviving wife of C. F. Phippen, and DANIEL KIRBY PHIPPEN, the only child of C. F. Phippen, and CHARLES C. CHAFFEE, Jr. and ANNE CHAFFEE, husband and wife, all of Boise, Ada County, Idaho, and EVERETT H. DOBBS and VERA L. DOBBS, husband and wife, of Seneca, Missouri, the parties of the first part, hereinafter referred to as the optionors, and BANNER MINING COMPANY, a corporation organized and existing under and by virtue of the laws of the State of Nevada, and qualified to do business in the State of Arizona, under the Constitution and laws thereof, party of the second part, hereinafter referred to as the optionee,

W I T N E S S E T H:

WHEREAS, the optionors own and hold Mining Leases identified and described as follows, to-wit:

Mining Lease dated April 20, 1948, executed between Barnsdall Mining Company of Delaware, a Delaware corporation, therein designated as "Lessor", and the said C. F. Phippen, therein designated as "Lessee", for the term of ten years

commencing on the 1st day of May, 1948, and ending on the 30th day of April, 1958, covering the following designated patented mining claims and property situate in Pima County, Arizona, known as the Mineral Hill Group, to-wit:

NAME OF CLAIM	WHERE RECORDED BOOK	PAGE
Daisy	32	134
Aimee (Annie)	32	134
Little Mammoth	32	134
Surprise (Sunrise)	32	134
Winnie	32	134
Carbonate	32	134
Ninety-Six	32	134
Crest	32	134
Copper Hill	32	134
Banes	32	134
Asurite No. 4	32	134
Jupiter	32	134
Milton	32	134
Crown Prince	32	115
Crown Prince No. 1	32	115
Crown Prince No. 3	32	115
Crown Prince No. 4	32	115
Crown Prince No. 5	32	115
Crown Prince No. 6	32	115
Crown Prince No. 7	32	115
Crown Prince No. 8	32	115
Crown Prince No. 9	32	115
Crown Prince No. 10	32	115
Hughes No. 1	32	121
Black Prince	32	141

a copy of which said Mining Lease is attached hereto, marked Exhibit A, and made a part hereof; and,

Mining Lease dated April 20, 1948, executed between Barnsdall Mining Company of Delaware, a Delaware corporation, therein designated as "Lessor", and the said C. F. Phippen, therein designated as "Lessee", for the term of ten years commencing on the 1st day of May, 1948, and ending on the 30th day of April, 1958, covering the

following designated mining claims and property situate in Pima County, Arizona, known as the Plumed Knight Group, to-wit:

NAME OF CLAIM	WHERE RECORDED BOOK	PAGE
Plumed Knight	DD Records of Mines	74
Plumed Knight No. 2	KK Records of Mines	439
Lake George	GG Records of Mines	216
Lake George No. 2	KK Records of Mines	440
South Side	HH Records of Mines	390
South Side No. 2	KK Records of Mines	438
Out Side	KK Records of Mines	156
Out Side No. 2	KK Records of Mines	441
Sunny Side	KK Records of Mines	155
Sunny Side No. 2	KK Records of Mines	437
Martha B. Ketz	KK Records of Mines	157
Martha B. Ketz No. 2	KK Records of Mines	440
Eida B.	KK Records of Mines	435
Eida B. No. 2	KK Records of Mines	436

a copy of which said Mining Lease is attached hereto, marked Exhibit B, and made a part hereof; and,

WHEREAS, each said Mining Lease provides option in the Lessee therein to purchase the property covered thereby; and,

WHEREAS, each said Mining Lease, copy whereof is attached hereto and made a part hereof, provides that the right of the Lessee thereunder "shall not be assigned or transferred except with the written consent of the Lessor first had and obtained"; and,

WHEREAS, the optionee desires a lease with an option to purchase the said mining claims and property covered by both said Mining Leases, copy of both whereof is attached hereto marked Exhibits A and B, respectively, and made a part hereof, and optionors desire to give to optionee a lease with an option to purchase the same, under the terms and conditions hereinafter set forth;

NOW, THEREFORE, For and in consideration of the sum of

Ten Dollars ($10.00) and other valuable consideration by the optionee to the optionors in hand paid, the receipt whereof is hereby acknowledged, and in consideration of the covenants and agreements hereinafter contained and on the part of the optionee to be done and performed and in consideration of the royalties reserved and the rentals to be paid by the optionee, the optionors hereby sublease unto the optionee and do hereby give and grant unto the optionee the exclusive right, privilege and option to purchase, all said mining claims and property, upon the terms and conditions hereinafter set forth.

IT IS UNDERSTOOD AND AGREED, HOWEVER, That each said Mining Lease (Exhibits A and B, respectively) provides that the rights of the Lessee thereunder "shall not be assigned or transferred except with the written consent of the Lessor first had and obtained"; and, that this sublease and option shall have no force nor effect until, nor unless, the optionors shall secure from the Lessor in each said Mining Lease (Exhibits A and B, respectively) a consent to this sublease and option to the optionee herein, and that when such consent shall be obtained this sublease and option shall relate back to the day and date hereof and shall be effective as of the day and date hereof, and IT IS FURTHER UNDERSTOOD AND AGREED That if such consent shall not be obtained before the 1st day of December, 1950, this agreement shall be wholly and completely at an end.

The term of this lease and option unless forfeited, cancelled, terminated or surrendered as hereinafter provided, shall expire on the 30th day of April, 1958.

IT IS FURTHER UNDERSTOOD AND AGREED That from the effective date of this lease and option agreement the optionee shall thereafter at its own cost and expense duly and punctually perform all and singular the terms, provisions and conditions of each said Mining Lease (Exhibits A and B respectively) on the part of the Lessee therein (the optionors herein) to be done and performed and shall make all payments, including royalties and rental and all other payments to be made under the terms of each said Mining Lease, to the end that each said Mining Lease shall continue in full force and effect and that the optionee may enter upon said mining claims and exercise all of the rights and privileges of the Lessee under the terms and conditions of each said Mining Lease except the right to relinquish the same, but subject to all of the covenants, agreements and conditions on the part of the Lessee therein to be done and performed;

And, the optionors represent that none of the terms of either said Mining Lease have been performed up to the date hereof but warrant that each said Mining Lease is still in full force and effect;

The optionors hereby expressly reserve to themselves, their heirs, administrators, executors and assigns, as royalty, the equal ten percent (10%) part of the net smelter returns on all ore and minerals of every kind which shall be mined or taken from said mining property and milled, smeltered, or otherwise turned to account, deducting therefrom and less the royalty required by said Mining Leases (Exhibits A and B) to be paid to Barnsdall Mining Company of Delaware, including also all royalty which shall be paid such Lessor on all gold, silver and other metals

recovered from said property in addition to copper, zinc and lead. In determining the net smelter return on which royalty shall be computed there shall be deducted, in addition to charges of the smelter, the railroad freight, if any, to the smelter if shipped to a smelter, and charges for trucking or hauling the ore from the mine to the railroad and/or smelter, and/or mill. The royalty to be paid to the optionors shall become due on each smelter return and shall be paid by the optionee to the optionors within ten days after receipt by the optionee of the net smelter return upon which such royalty payment shall be due. Said royalties reserved shall be deducted by the purchaser of the ores and/or concentrates or other products and paid directly to optionors accompanied by copies of the settlement sheets covering each lot of material purchased.

PROVIDED, HOWEVER, that the optionee agrees to pay to optionors, in addition to all royalties and payments to be paid to Barnsdall Mining Company of Delaware under the terms and conditions of each said Mining Lease Exhibits A and B, a minimum rental or royalty as follows:

The said sum of Three Hundred Dollars ($300.00) paid coincident with the execution hereof and the sum of Three Hundred Dollars ($300.00) on the 10th day of October, 1950, and on the 1st day of each month thereafter to and including the month of August, 1952 and on the 1st day of September, 1952 the sum of Six Thousand Four Hundred Dollars ($6,400.00), and on the 1st day of September, 1953 the sum of Ten Thousand Dollars ($10,000.00), and the further annual sum of Ten Thousand Dollars ($10,000.00) on the 1st day of September in each year thereafter to and including the year 1957, and on the 30th day of April, 1958 the sum of Thirty-six Thousand Four Hundred Dollars ($36,400.00); PROVIDED,

FURTHER, however, that in the event such ten percent (10%) royalty after deducting the amounts to be paid to Barnsdall Mining Company of Delaware as reserved by said Mining Leases Exhibits A and B, shall exceed the minimum royalty or rental next thereafter to be paid, then any and all excess shall be carried over and applied to the payment of the minimum rental or royalty next becoming due.

In the event of the comingling of ores from the claims above described and other claims the royalties reserved to which the optionors shall be entitled as above set forth shall be determined by and based upon dry weights and samples of ores, and percentage of recovery, made and taken by optionee in accordance with good engineering practice, taken from the above described claims prior to the comingling and milling with other ores aforesaid. In such event, royalties to be paid to the Barnsdall Mining Company of Delaware under the terms of said Mining Leases shall be paid direct to said Barnsdall Mining Company of Delaware, and the royalties reserved to be paid to the optionors herein shall be paid direct to the optionors by the optionee.

The parties hereto understand that said Mining Lease covering the Mineral Hill Group, copy whereof is attached hereto as Exhibit A, provides option to purchase the property therein described for the sum of Thirty Thousand Dollars ($30,000.00), all payments of royalty and other payments to apply thereon, and that said Mining Lease covering the Plumed Knight Group, copy whereof is attached hereto as Exhibit B, provides option to purchase the property therein described for the sum of Thirty Thousand Dollars ($30,000.00), all payments of royalty and other payments to apply thereon, and that throughout the term of this lease the optionee shall have the right, privilege and option to exercise on behalf of the optionors

the said option to purchase in each said Mining Lease Exhibits A and B and upon the terms in each such Mining Lease set forth and, that throughout the term of this lease the optionee shall have the exclusive right, privilege and option to purchase from the optionors all said leased property by paying in addition to all royalties and purchase moneys to be paid to Barnsdall Mining Company of Delaware under the terms of each said Lease, the further and additional sum of One Hundred Thousand Dollars ($100,000.00) lawful money of the United States of America which sum shall be paid to the optionors, and which sum shall, as hereinbefore stated be, in addition to the purchase moneys to be paid to Barnsdall Mining Company of Delaware for said property as specified in said Mining Leases Exhibits A and B. As stated in each said Mining Lease all royalties and intermittent payments which shall be made under the terms thereof shall apply on the purchase price to Barnsdall Mining Company of Delaware, and in the event this option is exercised to purchase said properties from the optionors, all payments, rentals or reserved royalties previously paid by the optionee or in its behalf under the terms of this agreement to the optionors, but not including royalties paid to Barnsdall Mining Company of Delaware, shall be credited upon the said purchase price of One Hundred Thousand Dollars ($100,000.00) to be paid to the optionors and the remaining balance of said purchase price of One Hundred Thousand Dollars ($100,000.00) to be paid to the optionors shall be immediately due and payable upon the exercise of this option to purchase from optionors.

THE OPTIONEE FURTHER AGREES AS FOLLOWS:

1. To furnish copies of results of drilling and prospecting

to the optionors within a reasonable time after drilling and prospecting shall have been performed;

2. To record and post the statutory notices now or hereafter required by the laws of the State of Arizona to keep the mining claims covered by said mining lease free and clear of all claims for labor or materials;

3. To do all work that shall be performed upon and in such mining claims in a good and miner-like manner;

4. To keep the said mining claims and property free and clear of all liens and encumbrances suffered by the optionee;

5. After optionee begins mining operations upon said mining claims to make monthly reports to the optionors, with duplicate returns and statements of receipts and/or statements of revenues, showing the amount of royalties payable;

6. To permit the optionors, or their agents, at reasonable times to examine the books relating to the mining operations of said property and the sale of the mining products therefrom, and examine said property and the mining operations conducted thereon or therein;

7. Furnish optionors with copies of reports made by the optionee to Barnsdall Mining Company of Delaware and file one copy thereof with the escrow holder; and,

8. The optionees agree to be bound by all of the terms and conditions of each said lease from Barnsdall Mining Company of Delaware, copy whereof is attached hereto, one as Exhibit A and the other as Exhibit B, and to comply with all of the terms and conditions thereof and to keep each said lease in full force and effect.

Upon default by optionee in making any of the payments hereinbefore provided, or to perform any of the covenants hereof or to make any payment provided to be made in either said Mining Lease from Barnsdall Mining Company of Delaware or to perform any of the covenants thereof, the optionors shall have the right, in addition to any other rights and remedies, to declare this mining lease and all rights of optionee under and by virtue of this instrument to be forfeited and terminated, said right to be exercised by the optionors giving written notice to optionee by registered mail specifying the particulars wherein the optionee is then in default, and providing that unless the delinquent payment is made or the failure to perform corrected within twenty (20) days from the date of said notice, this agreement shall be immediately forfeited and terminated, and upon such forfeiture or termination, all payments that shall have been made to optionors on the purchase price shall be considered as rents and royalties and shall be owned by optionors free and clear of any right or claim of optionee, and in this connection time is the essence of this agreement.

Failure of optionors to declare a forfeiture upon default in any payment or payments, or in the performance of any other provisions hereof, shall not be considered a waiver of optionors' right to declare forfeiture in the event of any succeeding default.

Optionee shall not incur any indebtedness for which the Owner shall be liable or which may become a lien or charge upon the property, and it is expressly understood and agreed that the optionee is not the Owner's agent for the doing of any work or

furnished in the mining and/or development of such mining claims, to keep at all times said mining claims and every part thereof free of any claim for labor or materials, then no further security or indemnity to the optionors shall be required.

Optionee shall have the right to use all buildings, machinery and equipment now on said premises in connection with the work and developing of said mining property under this lease, and it may, at its own cost and expense, alter, change and repair the same as it may deem necessary, in carrying on such mining operations, and it may, at its own cost and expense, erect such other buildings thereon and install such other machinery and equipment as it may deem necessary for carrying on such mining operations. Upon the termination of this lease for any cause, the optionee may remove any and all machinery and equipment, pipe, and other property except buildings, which it may have placed on said premises, pursuant to this agreement.

The optionee, at its sole discretion and expense, shall have the right to erect upon and at such mining claims such buildings and structures and to install such machinery, equipment and other property as it shall deem necessary or advisable in carrying on milling operations on said property. The optionee shall also have full rights of ingress and egress upon and across all such premises for all purposes connected with its milling operations of any said described property. Title to all machinery, equipment and other property, except permanent buildings, shall remain in the optionee at all times, and in the event of a forfeiture, cancellation or termination of this agreement any and all machinery,

equipment and other property, except permanent buildings, may be removed from said premises by the optionee within the period of one year from the time of such termination. All permanent buildings which shall be placed upon said described mining claims by the optionee shall become a part thereof and shall not be removed but the optionee shall have the right to make such alterations thereof and change in the location thereof as it may deem advisable from time to time in its mining operations and in its use thereof.

The optionors shall, upon demand in writing therefor at any time after July 1, 1951, furnish and deliver to the optionee abstract of title or abstracts of title to all said described mining claims, which said abstracts shall be continued to and certified as of a date subsequent to the date of the said demand, by a duly licensed and bonded abstracter. The optionee shall make its objections, if any, with respect to the titles to said property, within ninety (90) days from the delivery to it of such abstracts of title. Such objections shall be only to such conditions in the title of such property as shall render the title unmarketable or which shall constitute an encumbrance on the property. Taxes for the purposes of this provision of this agreement shall not be considered an encumbrance. Upon report in writing to the optionors of the optionee's objections, if any, to the titles as disclosed by such abstracts, then the optionors shall thereafter diligently undertake and consummate such proceedings and acts as shall be requisite to make such titles marketable and free of encumbrance.

In the event of and whenever any notice of forfeiture shall be given to any of the optionors herein under and by virtue of the terms of either said lease Exhibit A or B, the optionors

shall immediately notify the optionee herein of such notice and the contents thereof to the end that the optionee herein may remove any default upon which such notice of forfeiture may be predicated.

This agreement is an entirety and it may not be divided or severed by either of the parties hereto into any separate parts without the express written consent of the other party, and in this connection it is expressly understood that among other things, optionee may not assign separately from the lease herein the right to purchase the property.

This agreement shall be binding upon the parties hereto, their heirs, devisees, executors, administrators, successors and assigns, but the rights of optionee hereunder shall not be assigned or transferred except with the written consent of optionors first had and obtained.

Notwithstanding any of the foregoing provisions hereof, it is agreed and understood that optionee and its assigns shall have the right, at any time, by first giving the optionors thirty (30) days' notice of its election so to do, to surrender this lease and agreement and to re-deliver possession of said property to the optionors and to be relieved of all obligations thereafter to be performed under the terms of this agreement, provided that at the time of such surrender, all obligations on the part of the optionee shall have been fully and completely performed to the date of surrender. If the date fixed for surrender falls on any day subsequent to the 30th day of June

in any year, then as a condition precedent to its right to surrender, optionee shall, in addition to all other obligations, be required to first pay all taxes for that entire year.

Provided, further, that such surrender by optionee shall fully terminate this lease and relieve optionors of all further obligations hereunder, but such surrender shall not relieve optionee or its assigns from the payment of any royalties due or to become due on any ores or mineral that may have been mined prior to the actual surrender of the property, nor shall it relieve either party from any obligation, debt, claim or demand actually incurred and accrued to the other prior to the date of such surrender. Upon any such surrender by optionee, all payments that have been made to optionors, both as royalties and as payment on the purchase price of the property covered hereby, shall belong to optionors and shall be considered as rent and royalties hereunder, and upon such surrender, optionee or its assigns shall have no further right to buy the premises and shall be considered to have automatically forfeited all rights created hereunder to purchase the property covered hereby.

All notices of either party to the other shall be addressed to them respectively as follows: To optionors at: c/o Eugene H. Anderson, 504 Idaho Building, Boise, Idaho; to optionee at: 1910 First National Bank Building, Oklahoma City, Oklahoma.

IN WITNESS WHEREOF, the said parties of the first part have hereunto set their hands, and the said party of the second part has hereunto caused its corporate name to be hereunto

subscribed by its officers first thereunto duly authorized by resolution of its Board of Directors, this 7th day of November, 1950, but all as of the day and year herein first above written.

Anne M. Phippen
Anne M. Phippen

Daniel Kirby Phippen
Daniel Kirby Phippen

By: Anne M. Phippen
Anne M. Phippen, HIS ATTORNEY-IN-FACT.

Charles C. Chaffee
Charles C. Chaffee, Jr.

Anne Chaffee
Anne Chaffee

Everett H. Dobbs
Everett H. Dobbs

Vera L. Dobbs
Vera L. Dobbs

OPTIONORS

BANNER MINING COMPANY

By: N. Trimes
President

ATTEST:

W. H. Hardy
Secretary

OPTIONEE

STATE OF IDAHO, }
COUNTY OF ADA, } ss.

On this 7th day of November, 1950, before me, the undersigned, a Notary Public in and for said State, personally appeared Anne M. Phippen, known to me to be the person whose name is subscribed to the within instrument as the attorney-in-fact of Daniel Kirby Phippen, and acknowledged to me that she subscribed the name of Daniel Kirby Phippen thereto as principal, and her own name as attorney-in-fact.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal, the day and year in this certificate first above written.

Ferne Witt
Notary Public for Idaho,
Residing at Boise, Idaho.
My commission expires: 4/8/54

STATE OF IDAHO, }
COUNTY OF ADA, } ss.

On this 7th day of November, 1950, before me, the undersigned, a Notary Public in and for said State, personally appeared Charles C. Chaffee, Jr. and Anne Chaffee, husband and wife, and Anne M. Phippen, known to me to be the persons whose names are subscribed to the within instrument, and acknowledged to me that they executed the same.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal, the day and year in this certificate first above written.

Ferne Witt
Notary Public for Idaho,
Residing at Boise, Idaho.
My commission expires: 4/8/54

STATE OF MISSOURI, }
COUNTY OF NEWTON, } ss.

On this 10th day of November, 1950, before me, the undersigned, a Notary Public in and for said County and State, personally appeared Everett H. Dobbs and Vera L. Dobbs, husband and wife, known to me to be the persons whose names are subscribed to the within instrument, and acknowledged to me that they executed the same.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal, the day and year in this certificate first above written.

M M Mundell
Notary Public for the County of Newton,
State of Missouri.
Residing at Seneca, Missouri.
My commission expires: June 29, 1951

STATE OF OKLAHOMA, }
COUNTY OF OKLAHOMA, } ss.

This instrument was acknowledged before me this 17th day of November, 1950, by N. A. Grimes as the President of Banner Mining Company, a corporation.

Jeanne Jackson
Notary Public for the County of Oklahoma,
State of Oklahoma.
Residing at Oklahoma City, Oklahoma.
My commission expires: October 1, 1954

SUPPLEMENTAL AGREEMENT AND CONSENT

The undersigned, Everett H. Dobbs and Vera L. Dobbs, husband and wife, as grantees and assignees of Barnsdall Mining Company of Delaware, lessor in each of the within described mining leases dated April 20, 1948, and to which copies thereof are appended thereto as Exhibits A and B, do hereby consent and agree to the within and foregoing "Sublease of Mining Property and Option" between Anne M. Phippen and her son Daniel Kirby Phippen and Charles C. Chaffee, Jr. and Anne Chaffee, husband and wife, and Everett H. Dobbs and Vera L. Dobbs, husband and wife, as optionors and Banner Mining Company, a Nevada corporation, as optionee, and to all of the terms thereof and to all of the conditions thereof not contained in said original leases from Barnsdall Mining Company of Delaware, and the parties to said sublease and the undersigned further agree that the royalty to be paid under the terms of said leases Exhibits A and B for gold, silver and other metals recovered from the mining claims therein described, in addition to the copper, zinc and lead, shall be five per cent (5%) and in all other respects as defined in said mining leases Exhibits A and B, and that so long as the optionee in the foregoing sublease shall comply with the laws of the State of Arizona relating to labor and materials furnished for the development or operation of the mining claims in such sublease described, to keep such mining claims clear of all liens or claims for labor or materials, no further bond or other security shall be required of Banner Mining Company.

IN WITNESS WHEREOF the said Everett H. Dobbs and Vera L. Dobbs, as grantees and assignees of Barnsdall Mining Company of

Delaware with respect to the said mining leases and the property therein described, and as parties to the within and foregoing Sublease and Option, and the said Anne M. Phippen and Daniel Kirby Phippen, and Charles C. Chaffee, Jr. and Anne Chaffee, have hereunto subscribed their names, and the said Banner Mining Company, a Nevada corporation, has hereunto caused its corporate name to be subscribed, all this 7th day of November, 1950.

Everett H. Dobbs

Everett H. Dobbs

Vera L. Dobbs

Vera L. Dobbs

Anne M. Phippen

Anne Phippen

Daniel Kirby Phippen

Daniel Kirby Phippen

By Anne M. Phippen His Attorney in Fact
Anne M. Phippen

Charles C. Chaffee

Charles C. Chaffee, Jr.

Anne Chaffee

Anne Chaffee

BANNER MINING COMPANY

By [redacted] President

ATTEST: W. H. Hand
Secretary

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20

STATE OF IDAHO, }
COUNTY OF ADA, } ss.

On this 7th day of November, 1950, before me, the undersigned, a Notary Public in and for said State, personally appeared Anne M. Phippen, known to me to be the person whose name is subscribed to the within instrument as the attorney-in-fact of Daniel Kirby Phippen, and acknowledged to me that she subscribed the name of Daniel Kirby Phippen thereto as principal, and her own name as attorney-in-fact.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal, the day and year in this certificate first above written.

Ferne Witt
Notary Public for Idaho,
Residing at Boise, Idaho.
My commission expires: 4/8/54

STATE OF IDAHO, }
COUNTY OF ADA, } ss.

On this 7th day of November, 1950, before me, the undersigned, a Notary Public in and for said State, personally appeared Charles C. Chaffee, Jr. and Anne Chaffee, husband and wife, and Anne M. Phippen, known to me to be the persons whose names are subscribed to the within instrument, and acknowledged to me that they executed the same.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal, the day and year in this certificate first above written.

Ferne Witt
Notary Public for Idaho,
Residing at Boise, Idaho.
My commission expires: 4/8/54

21 3-fw

STATE OF MISSOURI, }
COUNTY OF NEWTON, } ss.

On this 10th day of November, 1950, before me, the undersigned, a Notary Public in and for said County and State, personally appeared Everett H. Dobbs and Vera L. Dobbs, husband and wife, known to me to be the persons whose names are subscribed to the within instrument, and acknowledged to me that they executed the same.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal, the day and year in this certificate first above written.

Notary Public for the County of Newton,
State of Missouri.
Residing at Seneca, Missouri.
My commission expires: June 29 1951

STATE OF OKLAHOMA, }
COUNTY OF OKLAHOMA, } ss.

This instrument was acknowledged before me this 17th day of November, 1950, by H. L. Grimes as the President of Banner Mining Company, a corporation.

Notary Public for the County of Oklahoma,
State of Oklahoma.
Residing at Oklahoma City, Oklahoma.
My commission expires: October 4, 1954

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22

EXHIBIT A

MINING LEASE

THIS AGREEMENT, Made and entered into this 20th day of April, 1948, by and between BARNSDALL MINING COMPANY OF DELAWARE, a Delaware corporation, duly authorized to do business in the State of Arizona, hereinafter designated "Lessor", party of the first part, and C. F. PHIPPEN of Boise, Idaho, hereinafter designated "Lessee", party of the second part,

WITNESSETH:

Lessor is the owner of the following described lands, mining claims and mineral rights situated in Pima County, Arizona, known as the Mineral Hill Group, to-wit:

	WHERE RECORDED	
NAME	BOOK	PAGE
Daisy	32	134
Aimee (Annie)	32	134
Little Mammoth	32	134
Surprise (Sunrise)	32	134
Winnie	32	134
Carbonate	32	134
Ninety-Six	32	134
Crest	32	134
Copper Hill	32	134
Banes	32	134
Asurite No. 4	32	134
Jupiter	32	134
Milton	32	134
Crown Prince	32	115
Crown Prince No. 1	32	115
Crown Prince No. 3	32	115
Crown Prince No. 4	32	115
Crown Prince No. 5	32	115
Crown Prince No. 6	32	115
Crown Prince No. 7	32	115
Crown Prince No. 8	32	115
Crown Prince No. 9	32	115
Crown Prince No. 10	32	115
Hughes No. 1	32	121
Black Prince	32	141

The parties hereto desire that Lessor shall lease to Lessee the above described property, with all buildings and

improvements thereon and tenements, hereditaments and appurtenances pertaining thereto or used in connection therewith, and all water rights owned by Lessor and used in connection with said property, for mining purposes, and that Lessee shall have certain rights to purchase said property, which lease and rights to purchase are more particularly hereinafter set forth.

THEREFORE, in consideration of the premises and of the mutual covenants and agreements herein contained, the parties hereto agree as follows:

1. Lessor hereby lets and leases unto Lessee all of the above described mining property, including the water rights, machinery, equipment and personal property thereon or used in connection therewith, and all tenements, hereditaments and appurtenances appertaining thereto or situate thereon and used in connection with the property, and grants unto Lessee the exclusive right to enter into the immediate possession thereof and to prospect on said properties for copper, lead, zinc, and other minerals, and to develop and operate said properties, and to mine, extract, mill or smelt the ores and minerals therefrom, and to sell and dispose of the ores and minerals so extracted during the term hereof, and subject to the covenants, terms and conditions herein provided.

2. This agreement is for the term of ten (10) years, commencing the 1st day of May, 1948, and ending on the 30th day of April, 1958. Lessee shall enter into immediate possession of said property, and continue in possession thereof as long as this agreement is in force, and he shall, at his own cost and expense, do or cause to be done all acts or things that may be necessary to protect and maintain in full

24

force and effect the right, title and interest of Lessor in and to said property, and Lessee shall pay all taxes that may be levied or assessed against the property or any part thereof and the business being conducted thereon that accrue during the term of this lease or as a result of the operations thereon, and Lessee shall furnish to Lessor, on or before the 1st day of May -, of each year, satisfactory evidence showing payment of all accrued taxes and compliance by Lessee with the terms hereof.

3. While in general the extent of the prospecting, developing and operating work on the property shall be left to the judgment and discretion of Lessee, this agreement is nevertheless on the express condition that Lessee in any event shall expend not less than Three Thousand Dollars ($3,000.00), during the first two (2) years of the term of this lease, and a similar amount during each succeeding two (2) year period during the term of this lease, in working, developing, and equipping said property. On or shortly before two (2) years from date hereof, Lessee shall deliver to Lessor a sworn statement showing the amount of mining operations conducted on the property and the amounts expended thereon. In the event Lessee has failed to expend the amount above provided during said two (2) year period, or in the event Lessee fails to deliver said statement to Lessor within said time, then Lessor shall have the right and option to cancel and terminate this lease to be exercised by mailing to Lessee a notice of cancellation and termination within twenty (20) days after receipt of said written statement or within twenty (20) days after

20

the time said statement was due. On or shortly before the expiration of each succeeding two (2) year period thereafter, a similar statement covering each succeeding two (2) year period shall be delivered by Lessee to Lessor, and Lessor shall have a similar option and right of cancellation and termination upon failure of Lessee to expend said amount during any of said two (2) year periods or failure of Lessee to deliver said statements in due time.

4. All mining operations by the Lessee in and upon the said properties shall be conducted in a proper and workmanlike manner, but Lessee shall not be liable for the caving or loss of the old mine workings now on the property; provided that nothing herein contained shall be construed to exempt Lessee from liability for damages to Lessor or to others by reason of the negligence of Lessee, his agents, servants, employees, successors, or assigns in operating and developing said properties.

5. Lessee shall pay, or cause to be paid, to the Lessor, royalties as listed below on net smelter returns on all ore and minerals of every kind mined or taken from the property and milled, smeltered or otherwise turned to account.

(a) Copper: - 5% as long as the price of copper remains at or below 25¢, but increasing 1% for each additional 1¢ increase until the royalty reaches 10%.

(b) Zinc: - 5% as long as the price of zinc remains at or below 16¢, but increasing 1% for each additional 1¢ increase until the royalty reaches 10%.

(c) Lead: - 5% as long as the price of lead remains at or below 18¢, but increasing 1% for each additional 1¢ increase until the royalty reaches 10%.

26

In determining the net smelter return on which the royalty shall be computed, there shall be deducted, in addition to the charges of the smelter, the railroad freight, if any, and charges for trucking or hauling the ore from the mine to the railroad or smelter. The royalty which shall become due on each smelter return shall be paid by the Lessee to the Lessor within ten (10) days after receipt by the Lessee of the net smelter return upon which such royalty payment shall be due. At the time of making each such payment of royalty, the Lessee shall transmit to the Lessor a duplicate smelter return statement of the smelter return upon which royalty was then being paid.

It is specifically agreed that Lessee shall, during the first three (3) years of the term of this Lease, pay to Lessor a minimum sum of Five Thousand Dollars ($5,000.00) in royalties; if the amount of royalties payable to Lessor on ore and minerals produced and marketed, based on the schedule of royalties above set out, is less than Five Thousand Dollars ($5,000.00) for the first three (3) years of the term hereof, then the difference between the amount paid to Lessor under the above schedule and the sum of Five Thousand Dollars ($5,000.00) shall be paid Lessor at the end of the period of three (3) years from date hereof.

6. The Lessor agrees to sell, and Lessee agrees to buy said property for the sum of Thirty Thousand Dollars ($30,000.00), which shall be paid on or before ten (10) years from date hereof. All royalties paid by the Lessee thereunder, including the minimum royalty payment, shall be credited upon the said purchase price.

27

Upon payment in full of the said Thirty Thousand Dollars ($30,000.00) purchase price, the Lessor shall execute and deliver to Lessee a good and sufficient deed conveying said described property to the Lessee free and clear of all encumbrances, save and except only those that may be caused and created by the Lessee, or which Lessee by the terms hereof is required to discharge during the term of the lease.

7. Upon default by Lessee in making any of the payments hereinbefore provided, or to perform any of the covenants hereof, the Lessor shall have the right, in addition to any other rights and remedies, to declare this mining lease and all rights of Lessee under and by virtue of this instrument to be forfeited and terminated, said right to be exercised by the Lessor giving written notice to Lessee by registered mail specifying the particulars wherein the Lessee is then in default, and providing that unless the delinquent payment is made or the failure to perform corrected within thirty (30) days from the date of said notice, this agreement shall be immediately forfeited and terminated, and upon such forfeiture or termination, all payments that shall have been made to Lessor on the purchase price shall be considered as rents and royalties and shall be owned by Lessor free and clear of any right or claim of Lessee, and in this connection time is the essence of this agreement.

Failure of Lessee to declare a forfeiture upon default in any payment or payments, or in the performance of any other provisions hereof, shall not be considered a waiver of Lessee's right to declare forfeiture in the event of any succeeding default.

28

8. Lessee shall not incur any indebtedness for which the owner shall be liable or which may become a lien or charge upon the property, and it is expressly understood and agreed that the Lessee is not the owner's agent for the doing of any work or the contracting of any indebtedness, but has only the right and interest of a lessee under this agreement. Lessee shall at all times during the life of this agreement keep the property, and the whole thereof, free and clear of all liens and encumbrances, and the owner shall not be liable for any expenditures made by Lessee or any obligations incurred or contracts entered into by Lessee, and Lessee shall so inform all persons doing labor on or furnishing materials for use on said premises and property at the instance or request of Lessee. Lessee, at his office and at the entrance of each mine being operated hereunder, shall post and keep posted in a conspicuous place, printed or typewritten notices advising all persons furnishing labor or materials the mines are being operated under a lease agreement, and that neither the owner nor the properties are liable for, or chargeable with the cost of labor or materials furnished for use on said premises, but that the Lessee is individually and solely liable therefor.

In the event any law shall be eneacted in the State of Arizona making mining property subject to lien for, or make it liable for the payment of, any obligations incurred by Lessee, then and thereupon Lessee shall at once make arrangements satisfactory to Lessor to fully protect and indemnify the Lessor against any such lien or liability, and failure of Lessee to promptly furnish such protection or indemnity to Lessor shall

29

be sufficient cause for the cancellation and termination of this agreement by the Lessor upon notice in writing, as provided in Paragraph 6 hereof.

9. Lessee agrees to permit Lessor, or its representatives, at all reasonable times, to enter upon the properties and inspect all workings and mining operations and to make such surveys and take such samples as Lessor or his representatives may desire.

10. Lessee shall have the right to use all buildings, machinery and equipment now on said premises in connection with the work and developing of said mining property under this lease, and he may, at his own cost and expense, alter, change and repair the same as he may deem necessary in carrying on such mining operations, and he may, at his own cost and expense, erect such other buildings thereon and install such other machinery and equipment as he may deem necessary for carrying on such mining operations. Upon the termination of this lease for any cause, the Lessee may remove any and all machinery and equipment, except buildings, which he may have placed on said premises, pursuant to this agreement.

11. This agreement is an entirety and it may not be divided or severed by either of the parties hereto into any separate parts without the express written consent of the other party, and in this connection it is expressly understood that among other things, Lessee may not assign separately from the lease herein the right to purchase the property.

12. This agreement shall be binding upon the parties hereto, their heirs, devisees, executors, administrators, successors and assigns, but the rights of Lessee hereunder shall not be assigned or transferred except with the

30

written consent of Lessor first had and obtained.

13. Notwithstanding any of the foregoing provisions hereof, it is agreed and understood that Lessee and his assigns shall have the right, at any time, by first giving the Lessor thirty (30) days notice of his election so to do, to surrender this lease and agreement and to re-deliver possession of said property to the Lessor and to be relieved of all obligation thereafter to be performed under the terms of this agreement, provided that at the time of such surrender, all obligations on the part of the Lessee shall have been fully and completely performed to the date of surrender. If the date fixed for surrender falls on any day subsequent to the 30th day of June in any year, then as a condition precedent to his right to surrender, Lessee shall, in addition to all other obligations, be required to first pay all taxes for that entire year.

Provided further that such surrender by Lessee shall fully terminate this lease and relieve Lessor of all further obligations hereunder, but such surrender shall not relieve Lessee or his assigns from the payment of any royalties due to the Owner on any ores or mineral that may have been mined prior to the actual surrender of the property, nor shall it relieve either party from any obligation, debt, claim or demand actually incurred and accrued to the other prior to the date of such surrender. Upon any such surrender by Lessee, all payments that have been made to Lessor, both as royalties and as payment on the purchase price of the property covered hereby, shall belong to Lessor and shall be considered as rent and royalties hereunder, and upon such surrender, Lessee or his assigns shall have no further right to buy the premises and shall be considered to have automaticaaly for-

31

feited all rights created hereunder to purchase the property covered hereby.

All notices of either party to the other shall be addressed to them respectively as follows: To Lessor, at P. O. Box 2039, Tulsa 2, Oklahoma; to Lessee, at 309 North Fourth Street, Boise, Idaho.

IN WITNESS WHEREOF, the parties have executed this agreement as of the day and year first above written.

BARNSDALL MINING COMPANY OF DELAWARE

ATTEST: (SEAL)

By Jas. A. Dunn
President.
LESSOR

Frank Braman
Secretary.

C. F. Phippen
C. F. Phippen

LESSEE

STATE OF NEW YORK)
COUNTY OF NEW YORK) SS.

This instrument was acknowledged before me this 3rd day of May, 1948, by JAS. A. DUNN, President of BARNSDALL MINING COMPANY OF DELAWARE, a corporation.

(SEAL)
My commission expires:
Wm. Dewey Loucks, Jr.,
Notary Public, Westchest County
Certificate Filed In
N. Y. Co. Clk's No. 374, Reg. No. 680-L-M
Commissioner Expires March 30, 1950

Wm. Dewey Loucks, Jr.
Notary Public.

STATE OF OKLAHOMA)
COUNTY OF TULSA) SS.

This instrument was acknowledged before me this 20th day of April, 1948, by C. F. Phippen.

(SEAL)

Clarice Pinkerton
Notary Public

My commission expires:
March 8, 1950

32

EXHIBIT B

MINING LEASE

THIS AGREEMENT, Made and entered into this 20th day of April, 1948, by and between BARNSDALL MINING COMPANY OF DELAWARE, a Delaware corporation, duly authorized to do business in the State of Arizona, hereinafter designated "Lessor", party of the first part, and C. F. PHIPPEN of Boise, Idaho, hereinafter designated "Lessee", party of the second part,

WITNESSETH:

Lessor is the owner of the following described lands, mining claims and mineral rights situated in Pima County, Arizona, known as the Plumed Knight Group, to-wit:

	WHERE RECORDED	
NAME	BOOK	PAGE
Plumed Knight	DD Records of Mines	74
Plumed Knight No. 2	KK Records of Mines	439
Lake George	GG Records of Mines	216
Lake George No. 2	KK Records of Mines	440
South Side	HH Records of Mines	390
South Side No. 2	KK Records of Mines	438
Out Side	KK Records of Mines	156
Out Side No. 2	KK Records of Mines	441
Sunny Side	KK Records of Mines	155
Sunny Side No. 2	KK Records of Mines	437
Martha B. Ketz	KK Records of Mines	157
Martha B. Ketz No. 2	KK Records of Mines	440
Eida B.	KK Records of Mines	435
Eida B. No. 2	KK Records of Mines	436

The parties hereto desire that Lessor shall lease to Lessee the above described property, with all buildings and improvements thereon and tenements, hereditaments and appurtenances pertaining thereto or used in connection therewith, and all water rights owned by Lessor and used in connection with said property, for mining purposes, and that Lessee shall have certain rights to purchase said property, which lease and

rights to purchase are more particularly hereinafter set forth.

THEREFORE, in consideration of the premises and of the mutual covenants and agreements herein contained, the parties hereto agree as follows:

1. Lessor hereby lets and leases unto Lessee all of the above described mining property, including the water rights, machinery, equipment and personal property thereon or used in connection therewith, and all tenements, hereditaments and appurtenances appertaining thereto or situate thereon and used in connection with the property, and grants unto Lessee the exclusive right to enter into the immediate possession thereof and to prospect on said properties for copper, lead, zinc, and other minerals, and to develop and operate said properties, and to mine, extract, mill or smelt the ores and minerals therefrom, and to sell and dispose of the ores and minerals so extracted during the term hereof, and subject to the covenants, terms and conditions herein provided.

2. This agreement is for a term of ten (10) years, commencing the 1st day of May, 1948, and ending on the 30th day of April, 1958. Lessee shall enter into immediate possession of said property, and continue in possession thereof as long as this agreement is in force, and he shall, at his own cost and expense, do or cause to be done all acts or things that may be necessary to protect and maintain in full force and effect the right, title and interest of Lessor in and to said property, and Lessee shall pay all taxes that may be levied or assessed against the property or any part thereof and the business being conducted thereon that accrue during the

34

term of this lease or as a result of the operations thereon, and Lessee shall furnish to Lessor, on or before the 1st day of May, of each year, satisfactory evidence showing payment of all accrued taxes and compliance by Lessee with the terms hereof.

3. While in general the extent of the prospecting, developing and operating work on the property shall be left to the judgment and discretion of Lessee, this agreement is nevertheless on the express condition that Lessee in any event shall expend not less than Three Thousand Dollars ($3,000.00), during the first two (2) years of the term of this lease, and a similar amount during each succeeding two (2) year period during the term of this lease, in working, developing, and equipping said property. On or shortly before two (2) years from date hereof, Lessee shall deliver to Lessor a sworn statement showing the amount of mining operations conducted on the property and the amounts expended thereon. In the event Lessee has failed to expend the amount above provided during said two (2) year period, or in the event Lessee fails to deliver said statement to Lessor within said time, then Lessor shall have the right and option to cancel and terminate this lease to be exercised by mailing to Lessee a notice of cancellation and termination within twenty (20) days after receipt of said written statement or within twenty (20) days after the time said statement was due. On or shortly before the expiration of each succeeding two (2) year period thereafter, a similar statement covering each succeeding two (2) year period shall be delivered by Lessee to Lessor, and Lessor shall have a similar option and right of cancellation and termination

35

upon failure of Lessee to expend said amount during any of said two (2) year periods or failure of Lessee to deliver said statements in due time.

4. All mining operations by the Lessee in and upon and said properties shall be conducted in a proper and workmanlike manner, but Lessee shall not be liable for the caving or loss of the old mine workings now on the property; provided that nothing herein contained shall be construed to exempt Lessee from liability for damages to Lessor or to others by reason of the negligence of Lessee, his agents, servants, employees, successors, or assigns in operating and developing said properties.

5. Lessee shall pay, or cause to be paid, to the Lessor, royalties as listed below on net smelter returns on all ore and minerals of every kind mined or taken from the property and milled, smeltered or otherwise turned to account.

(a) Copper: - 5% as long as the price of copper remains at or below 25¢, but increasing 1% for each additional 1¢ increase until the royalty reaches 10%.

(b) Zinc: - 5% as long as the price of zinc remains at or below 16¢ but increasing 1% for each additional 1¢ increase until the royalty reaches 10%.

(c) Lead: - 5% as long as the price of lead remains at or below 18¢, but increasing 1% for each additional 1¢ increase until the royalty reaches 10%.

In determining the net smelter return on which the royalty shall be computed, there shall be deducted, in addition to the charges of the smelter, the railroad freight, if any, and charges for trucking or hauling the ore from the mine to

36

the railroad or smelter. The royalty which shall become due on each smelter return shall be paid by the Lessee to the Lessor within ten (10) days after receipt by the Lessee of the net smelter return upon which such royalty payment shall be due. At the time of making each such payment of royalty, the Lessee shall transmit to the Lessor a duplicate smelter return statement of the smelter return upon which royalty was then being paid.

It is specifically agreed that Lessee shall, during the first three (3) years of the term of this lease, pay to Lessor a minimum sum of Five Thousand Dollars ($5,000.00) in royalties; if the amount of royalties payable to Lessor on ore and minerals produced and marketed, based on the schedule of royalties above set out, is less than Five Thousand Dollars ($5,000.00) for the first three (3) years of the term hereof, then the difference between the amount paid to Lessor under the above schedule and the sum of Five Thousand Dollars ($5,000.00) shall be paid Lessor at the end of the period of three (3) years from date hereof.

6. The Lessor agrees to sell, and Lessee agrees to buy said property for the sum of Thirty Thousand Dollars ($30,000.00), which shall be paid on or before ten (10) years from date hereof. All royalties paid by the Lessee thereunder, including the minimum royalty payment, shall be credited upon the said purchase price.

Upon payment in full of the said Thirty Thousand Dollars ($30,000.00) purchase price, the Lessor shall execute and deliver to Lessee a good and sufficient deed conveying

37

said described property to the Lessee free and clear of all encumbrances, save and except only those that may be caused and created by the Lessee, or which Lessee by the terms hereof is required to discharge during the term of the lease.

7. Upon default by Lessee in making any of the payments hereinbefore provided, or to perform any of the covenants hereof, the Lessor shall have the right, in addition to any other rights and remedies, to declare this mining lease and allrights of Lessee under and by virtue of this instrument to be forfeited and terminated, said right to be exercised by the Lessor giving written notice to Lessee by registered mail specifying the particulars wherein the Lessee is then in default, and providing that unless the delinquent payment is made or the failure to perform corrected within thirty (30) days from the date of said notice, this agreement shall be immediately forfeited and terminated, and upon such forfeiture or termination, all payments that shall have been made to Lessor on the purchase price shall be considered as rents and royalties and shall be owned by Lessor free and clear of any right or claim of Lessee, and in this connection time is the essence of this agreement.

Failure of Lessee to declare a forfeiture upon default in any payment or payments, or in the performance of any other provisions hereof, shall not be considered a waiver of Lessee's right to declare forfeiture in the event of any succeeding default.

8. Lessee shall not incur any indebtedness for which the Owner shall be liable or which may become a lien or

38

charge upon the property, and it is expressly understood and agreed that the Lessee is not the owner's agent for the doing of any work or the contracting of any indebtedness, but has only the right and interest of a lessee under this agreement. Lessee shall at all times during the life of this agreement keep the property, and the whole thereof, free and clear of all liens and encumbrances, and the owner shall not be liable for any expenditures made by Lessee or any obligations incurred or contracts entered into by Lessee, and Lessee shall so inform all persons doing labor on or furnishing materials for use on said premises and property at the instance or request of Lessee. Lessee, at his office and at the entrance of each mine being operated hereunder, shall post and keep posted in a conspicuous place, printed or typewritten notices advising all persons furnishing labor or materials the mines are being operated under a lease agreement, and that neither the owner nor the properties are liable for, or chargeable with the cost of labor or materials furnished for use on said premises, but that the Lessee is individually and solely liable therefor.

In the event any law shall be enacted in the State of Arizona making mining propertysubject to lien for, or make it liable for the payment of, any obligations incurred by Lessee, then and thereupon Lessee shall at once make arrangements satisfactory to Lessor to fully protect and indemnify the Lessor against any such lien or liability, and failure of Lessee to promptly furnish such protection or indemnity to Lessor shall be sufficient cause for the cancellation and termination of

39

this agreement by the Lessor upon notice in writing, as provided in Paragraph 6 hereof.

9. Lessee agrees to permit Lessor, or its representatives, at all reasonable times, to enter upon the properties and inspect all workings and mining operations and to make such surveys and take such samples as Lessor or his representatives may desire.

10. Lessee shall have the right to use all buildings, machinery and equipment now on said premises in connection with the work and developing of said mining property under this lease, and he may, at his own cost and expense, alter, change and repair the same as he may deem necessary in carrying on such mining operations, and he may, at his own cost and expense, erect such other buildings thereon and install such other machinery and equipment as he may deem necessary for carrying on such mining operations. Upon the termination of this lease for any cause, the Lessee may remove any and all machinery and equipment, except buildings, which he may have placed on said premises, pursuant to this agreement.

11. This agreement is an entirety and it may not be divided or severed by either of the parties hereto into any separate parts without the express written consent of the other party, and in this connection it is expressly understood that among other things, Lessee may not assign separately from the lease herein the right to purchase the property.

12. This agreement shall be binding upon the parties hereto, their heirs, devisees, executors, administrators, successors and assigns, but the rights of Lessee here-

70

under shall not be assigned or transferred except with the written consent of Lessor first had and obtained.

13. Notwithstanding any of the foregoing provisions hereof, it is agreed and understood that Lessee and his assigns shall have the right, at any time, by first giving the Lessor thirty (30) days notice of his election so to do, to surrender this lease and agreement and to re-deliver possession of said property to the Lessor and to be relieved of all obligation thereafter to be performed under the terms of this agreement, provided that at the time of such surrender, all obligations on the part of the Lessee shall have been fully and completely performed to the date of surrender. If the date fixed for surrender falls on any day subsequent to the 30th day of June in any year, then as a condition precedent to his right to surrender, Lessee shall, in addition to all other obligations, be required to first pay all taxes for that entire year.

Provided further that such surrender by Lessee shall fully terminate this lease and relieve Lessor of all further obligations hereunder, but such surrender shall not relieve Lessee or his assigns from the payment of any royalties due to the Owner on any ores or mineral that may have been mined prior to the actual surrender of the property, nor shall it relieve either party from any obligation, debt, claim or demand actually incurred and accrued to the other prior to the date of such surrender. Upon any such surrender by Lessee, all payments that have been made to Lessor, both as royalties and as payment on the purchase price

41

of the property covered hereby, shall belong to Lessor and shall be considered as rent and royalties hereunder, and upon such surrender, Lessee or his assigns shall have no further right to buy the premises and shall be considered to have automatically forfeited all rights created hereunder to purchase the property covered hereby.

All notices of either party to the other shall be addressed to them respectively as follows: To Lessor, at P. O. Box 2039, Tulsa 2, Oklahoma; to Lessee, at 309 North Fourth Street, Boise, Idaho.

IN WITNESS WHEREOF, the parties have executed this agreement as of the day and year first above written.

ATTEST: (SEAL)

Frank Braman
Secretary

BARNSDALL MINING COMPANY OF DELAWARE

By Jas. A. Dunn
President.

LESSOR

C. F. Phippen
C. F. Phippen

LESSEE

STATE OF IDAHO)
(SS
COUNTY OF NEW YORK)

This instrument was acknowledged before me this 3rd day of May, 1948, by Jas. A. Dunn, President of Barnsdall Mining Company of Delaware, a corporation.

(SEAL)

My commission expires:

March 30, 1950 (rubber stamp)

Wm. Dewey Loucks, Jr.
Notary Public

STATE OF OKLAHOMA)
) SS
COUNTY OFTULSA)

This instrument was acknowledged before me this 20th day of April, 1948, by C. F. Phippen.

(SEAL)

My commission expires:
March 8, 1950

Clarice Pinkerton
Notary Public

42

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
WASHINGTON 25, D. C.

DOCKET COPY

PROJECT SUMMARY REPORT

By: F. L. Knouse December 24, 1953

1. DMEA Docket No. 269X-A
Contract No. I-DMA-E32
Property: Mineral Hill Copper Mine, consisting of the patented mining claims, Banes, Copper Hill, and Milton
Pima County, Arizona.
Lessee from the Barnsdall Mining Company, dated April 20, 1948.
(Annex 2 to contract I-DMA-E32 agrees to waive (requirement of the lessor's subordination agreement).

Operator: Banner Mining Company
2042 Conner Stravenue
Tucson, Arizona

2. Contract - dated June 29, 1951.

Work authorized - Government authorized	$126,786.00
Government's participation 50% or	$ 63,393.00
a. Power installation	$ 10,000.00
b. Rehabilitate 500' vertical shaft @ $30.00/ft. If required by State law for access and ventilation	$ 15,000.00
c. Rehabilitate 700 foot incline shaft @ $30.00/ft. (900' slope distance)	$ 27,000.00
d. Incline shaft - 45 foot high head frame and bin installation	$ 6,300.00
e. Vertical shaft head frame repair and hoist installation	$ 1,500.00
f. Clean out and make accessible 3900 feet of drifts and crosscuts on the 500, 600 and 700 foot levels @ $7.00/ft. and 400 feet of raise @ $10.00/ft.	$ 27,300.00
g. 1500 feet of diamond core drilling from the 500 and 600 levels @ $4.00/ft.	$ 6,000.00
h. 400 feet of drifting - 6x8 feet in crosssection the 600 level @ $27.00/ft.	$ 10,800.00
i. Sampling and assaying	$ 2,100.00

j.	Geological study including surveying and mapping	$ 800.00
	Hoist house and combination changeroom	$ 5,450.00
	Equipment	$ 8,656.00
	Repairs to facilities	$ 580.00
	Compensation Insurance	
	Social Security & pay roll taxes	$ 5,300.00
	T O T A L	$126,786.00

Amendments -

No. 1 (although not numbered), dated November 20, 1951.
Permitted employment of two electricians @ $2.00/hr.
One bookkeeper @ $65.53/month
and allowed rental of one 6-ton Diamond T-Truck @ $2.00/hr.

No. 2 - dated February 16, 1952.
Permitted increase in wage rates of workmen and salaries of supervisors.

No. 3 - dated February 16, 1952.
Permitted rental of 685 c.f.m. G-D compressor @ $131.16/mo. in lieu of a 445 c.f.m. compressor originally allowed.

No. 4 - dated April 11, 1952.
Permits employment of seven addditional workmen.

No. 5 - dated September 26, 1952.
Sets forth time Superintendent Engineer and Foreman are to be employed on project work, and extends time for completion of the work an additional 12 months.

Work Completed -

	Description	Actual Cost	Footage Rehabilitated	Actual Cost per Foot
1.	Initial Rehabilitation & Repairs to Existing Facilities together with Power Installation.			
a.	Building Bins in Warehouse.	344.77		
b.	Walling of Section of Warehouse for Office Space	418.04		
c.	Deposit for Power Line and Installing Necessary Electrical Equipment to Service Motors.	11,157.08		

Description	Actual Cost	Footage Rehabilitated	Actual cost per foot
2. Erecting 40' x 40' Steel Frame Galvanized Iron Clad Shop and Changeroom Building. (½ of total cost).	3,688.71		
3. Erecting 20' x 25' Wood Frame, Galvanized Iron Clad Hoist House.	1,252.34		
4. Framing & Erecting 45' Wooden Headframe, Installing Skip Dump, Installing 75 HP Single Drum Hoist.	6,086.51		
5. Repair, Retimber where necessary to make accessible-837' Inclined Shaft.	48,547.51	837.0'	$ 58.00
6. 500 Level Rehabilitation.	10,659.02	994.5'	10.72
7. 600 Level Rehabilitation.	32,092.21	2,282.0'	14.06
8. 700 Level Rehabilitation.	1,020.99	208.5'	4.90
9. Sampling and assaying, surveying and mapping.	2,549.05		
10. Equipment Purchases	2,165.25		
11. Equipment (Depreciation)	2,034.29		
12. Power Cost.	5,316.35		
13. Freight & Transportation Cost	877.82		
T O T A L	$128,209.94		

Note:

(1) Compensation Insurance, Social Security and Unemployment Taxes, etc. have been included in the costs of the various jobs.

(2) The Diamond Drilling and the Drifting as set up in item 7 of the contract was not done because of exhaustion of funds.

(3) The work of repairing the 500 foot vertical shaft and the headframe over it was not completed due to exhaustion of funds. However, Banner Mining Company is now proceeding with this work and this shaft has been rehabilitated to a depth of 250 feet at this time.

(4) The Total Estimates cost of the project was $126,789.00.

Project work was completed during December 1952.

3. Audit Certificate, dated May 5, 1953.

Total allowed by contract		$126,789.00
Total cost per MF-104		128,209.94
Less: Proceeds from Property Disposition		25,550.97
Adjusted Cost		$102,658.97
Exceptions:		
During Audit	$403.33	
Prior to Audit	-o-	403.33
Total accepted cost		$102,255.64
Government participation 50%		$ 51,127.82

4. Certification date - May 29, 1953

Ore reserve estimates - measured, indicated and inferred 451,261 tons as estimated by the examining engineers and geologists and 529,400 tons as estimated by Operator of 0.78 ounces silver per ton, 2.61 percent copper, 0.05 percent WO_3 and 0.05 percent MOS_2 as estimated from some 500 samples.

Production - Operator reports a production of 1582 tons of ore containing 4.34 percent copper up to May 1, 1953.

5. Comments:

The project was conducted in an efficient manner. Operator furnished good engineering and geological reports. The project was established to verify the existence of and extensions of reported partially developed copper, silver, molybdenum, tungsten ore bodies, by re-opening, and rehabilitating old workings and diamond drilling for ore body extensions. It is believed that sufficient low grade copper ore reserves with accessory minerals havebeen found to justify a beneficiation plant. The ore occurs principally in NACO limestone

and shales as replacements of the contact metamorphic type. The work completed was successful in adding to and verifying the reported tonnage of expected ore reserves but the shape and size of the ore bodies have not been fully determined. It will be necessary to do additional work to more fully establish ore reserves and add to the known reserves. However, the operator is financially able to do this additional work without additional Government exploration assistance. Metallurgical work has been done and a processing plant is being constructed.

This property is a potential source of copper, some molybdenum, tungsten and silver during period of high metal prices or in a national emergency.

F. L. Knouse

FLKnouse/db
12-29-53
cc to: Docket (Original)
Adm. Reading File
Operating Committee
Mr. Ellis
Mr. Knouse
Chron.

File Copy
Surname

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
WASHINGTON 25, D. C.

September 21, 1955

Memorandum

To: The Administrator

From: Chief, Base Metals Division

Subject: Docket No. DMEA-1526, Vermont Copper Company, Elizabeth Mine, Orange County, Vermont, Contract No. Idm-494, (Copper).

Docket No. DMA-269X-A, Banner Mining Company, Mineral Hill Copper Mine, Pima County, Arizona, Contract No. I-DMA-E32, Copper.

Docket No. DMA-269X-B, Banner Mining Company, Twin Buttes Copper Mine, Pima County, Arizona, Contract No. I-DMA-E33, Copper.

I have scanned the above dockets relative to any possible change in tonnage setup due to present copper prices.

In the case of Vermont Copper Company, Inc., it would be hard to expand the ore reserve (due to increased price base) with the information we have at hand.

The DMEA drilling extended the known ore zone for a distance of 800 feet northerly. It is quite probable that such ore zone continues northerly beyond the limits of the DMEA drilling, but no data are available other than favorable surface exposures.

The main ore body occurs in the east limb of a synclinal fold. DMEA drilling also indicated mineralized areas within the west limb of the same fold but the intercepts were very low grade, 0.3 to 0.5% copper, which is hardly ore even at present prices. However, it is possible that this west limb may contain commercial ores in some areas.

As to the remaining tonnage, these people paid their indebtedness to the Government in May 1954 and we have no subsequent data. DMEA ores were 90,000 tons, 2.5% Cu.

We have two Banner Mining Company projects, DMA-269X-A and DMA-269X-B.

DMA-269X-A

The Field Team gave an estimate of 451,261 tons of 2.8% copper ore.

The Operator's estimate was 529,400 tons with a grade of:

2.61% Cu.
.78oz. Ag.
.05% WO_3
.05% MoS_2

In view of the present price situation, I would be inclined to accept the Operator's estimate.

The company also discovered a promising orebody called The Daisy Mine, some 2,500 feet to the northwest. We have little information on this.

As to ore remaining, the Government received full payment in April 1955, and we have no recent information. A fair guess would be that 225,000 tons have been milled to date, which would leave some 300,000 tons. However, some of the ore milled may have come from the Daisy Mine.

DMA-269X-B

A small DMA orebody of 4,057 tons has already been mined out. However, low-grade ores, totalling 63,800 tons of 1.6% copper, should properly be included if such has not already been done. Such ore should be commercial today.

W. R. Griswold

W. R. Griswold

WRG/er

Copy to: Docket (3)
Base Metals (3)
Chrom.

Talbert
Chambers

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
WASHINGTON 25, D. C.

JUL 2 6 1955

Mr. T. H. Brading
DMEA Auditor
224 New Customhouse
Denver 2, Colorado

Re: Banner Mining Company
Contract No. I-DMA-32
Docket No. DMA-269X-A

Dear Mr. Brading:

Reference is made to your letter of July 22, 1955, requesting advice as to whether a Report of Royalty Review is desired to cover the subject Exploration Project Contract.

The records indicate that the Operator has repaid the total amount of the Government's participation. Furthermore, by letter to the Operator under date of June 20, 1955 the Administration acknowledged liquidation of the amount advanced by the Government. Copies of this letter were furnished the Region III Field Team.

Accordingly, a Report of Royalty Review is not necessary since no purpose would be served by its issuance.

Sincerely yours,

SIGNED

Jay L. Chambers, Chief
Contract Administration
and Audit Division

EDTalbert/ama
July 26, 1955

Copy to: Docket
Admr. Reading File
Mr. Chambers

R.P.S.

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
WASHINGTON 25, D. C.

RECEIVED
JUL 25 1955

224 New Customhouse
Denver, 2, Colorado

July 22, 1955

Mr. Jay L. Chambers, Chief
Contract Administration and Audit Division
Defense Minerals Exploration Administration
Washington 25, D. C.

Re: Banner Mining Co
Contract No. IDMA-E32
Docket No. DMA-269XA

Dear Mr. Chambers:

An examination of the Finance Officer's records, Region III, confirms the fact that the subject operator has repaid royalties totaling $51,127.82, which is equivalent to the total Government participation in this project.

Will you please advise if you wish a Report of Royalty Review on this project.

Sincerely,

T. H. Brading

T. H. Brading, Auditor

☒ Audited

☒ Certified

[redacted] ANALYSIS SHEET - DMEA PROJECT [redacted]

Analysis as of 12/2/54
Incl. Voucher for Dec. 1952

☒ Actual Cost

☐ Agreed Unit Costs

Name Banner Mining Company

DMA Docket No. 269A-X

State Arizona

Commodity Copper

Idm-E No. 32

OPERATION	AUTHORIZED Units	AUTHORIZED Cost	COMPLETED Units	COMPLETED Cost	NET COST
Drifting & Crosscutting	400	10,800.00	—	—	
Raising					
Shafts			Transferred to Underground Rehabilitation		
Winzes					
Drilling Diamond-Core (Specify)	1500	6000.00	—	—	
Surface Excavation					
Underground Excavation					
Roads and Trails					
Operating Equipment Purchased		2165.25		2,165.25	— *
Surface Rehabilitation & Repairs		4001.12		4,001.12	4,001.12
Underground Rehabilitation		98971.25		99,991.86 ✓	98,254.52 *
New Building, Improvements, etc.		21,648.38		21,648.38	— *
Other (Specify)					
Totals		$126,786.00		$127,806.61 ✓	$102,255.64

Distributed to underground rehabilitation:

Labor, supplies, supervision etc.	$69,300.00
Assay & Engineering	2900.00
Insurance & Taxes	5300.00
Drifting	10,800.00
Diamond drilling	6,000.00
Use of other funds authorized	4671.25
	$98,971.25

* Purchased by Banner Mining Co. at end of contract:

Operating equipment	$2165.25
Physical improvements	21,648.38
Materials & supplies	1737.34
	$25,550.97

Prepared by F. M. Murphy

✓ accepted by auditor pending salvage.

✓

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
WASHINGTON 25, D. C.

Alley
Talbot
Klingschard
Lazurd
Selfridge
Fehlman

Mr. E. S. Bowman, President
Banner Mining Company
2042 Conner Stravenue
Tucson, Arizona

JUN 20 1955

Re: Docket No. DMA-269X-A (Copper)
Contract No. I-DMA-E32
Banner Mining Company
Mineral Hill Copper Mine
Pima County, Arizona

Dear Mr. Bowman:

Under the contract cited above the Government allotted a total of $126,789.00 for exploration of copper and agreed to share 50 percent of the cost as approved and accepted by this Administration. The Contract Administration and Audit Division of this Administration in its final audit report of May 5, 1953, determined the total allowable cost of the project to be $102,255.64, and the Government's share at 50 percent participation to be $51,127.82.

Since the exploration work resulted in a discovery, the Company was to pay the Government a royalty at a rate stipulated in the contract for a period of 10 years or until the amount advanced by the Government was liquidated, whichever occurred first. You started to pay royalty in November 1954 and have consistently paid royalty until April 1955, at which time you liquidated the amount advanced by the Government.

I wish to congratulate you for a successful exploration and to thank you for the payment of your account under the contract. It has been a pleasure to participate with you in this very fine underteking.

Sincerely yours,

C. O. Mittendorf

Administrator

AMAlley/ama
June 17, 1955

Copy to: Docket
Admr. Reading File
Administrator
Region III Field Team (2)
Mr. Johnson
Mr. Kiilsgaard
Mr. Meyer
Mr. Griswold
Mr. Chambers

R.C.

For Certificate of Deposit No. 102, dated May 2, 1955, giving royalty repayment of $14,593.45, see E-6.

QUADRUPLICATE

STANDARD FORM 209c (Formerly Cert. of Deposit, Form 6599)
Promulgated August 1951 by Treasury Department, Fiscal Service

CERTIFICATE OF DEPOSIT FOR CHECKING ACCOUNT

Deposited with Federal Reserve Bank of Kansas City, Mo., Denver, Colo. 4/8

(Name and location of depositary) (Date sent)

DEPOSIT NO. 14-23-040-91

$ 20,333.40

the sum shown opposite for credit, subject to check, in the disbursing account of—

C. E. Evans, R.D.O., Denver, Colo.

(Name and address of officer to be credited)

SYMBOL NO. 413

APR 11

On account of— 14X4401

(Depositor will insert below his name, title, Department or Agency concerned, and his address)

Defense Minerals Exploration
Administration
224 New Customhouse
Denver 2, Colo.

SPACE BELOW TO BE USED BY DEPOSITARY ONLY

I certify that the above amount has been received for credit in the account of the Treasurer of the United States on the date shown, subject to adjustment for uncollectible items included therein.

(Authorized signature)

APR 8 1953

(Date of credit in Treasurer's account)

DEPOSITARY WILL DATE, SIGN, AND RETURN THIS TO DEPOSITOR FOR HIS RETAINED COPY

Banner Mining Co. E-32 20,333.40

DENVER BRANCH

1955 APR 8 AM 11 47

MAIL DEPT.

QUADRUPLICATE

STANDARD FORM 209c (Formerly Cert. of Deposit, Form 399)
Promulgated August 1951 by Treasury Department, Fiscal Service

CERTIFICATE OF DEPOSIT FOR CHECKING ACCOUNT

DEPOSIT NO. 14-23-040-77

Deposited with Federal Reserve Bank of Kansas City, Mo. 3/2/[illegible]
(Name and location of depositary) Denver, Colorado (Date sent)

$ 5,312.00

the sum shown opposite for credit, subject to check, in the disbursing account of—

E-32

C. E. Evans, HDO, Denver, Colorado
(Name and address of officer to be credited)

SYMBOL NO.

On account of—
14X4401

(Depositor will insert below his name, title, Department or Agency concerned, and his address)

Defense Minerals Exploration
Administration
224 New Customhouse
Denver 2, Colorado

SPACE BELOW TO BE USED BY DEPOSITARY ONLY
I certify that the above amount has been received for credit in the account of the Treasurer of the United States on the date shown, subject to adjustment for uncollectible items included therein.

(Authorized signature)

(Date of credit in Treasurer's account)

DEPOSITARY WILL DATE, SIGN, AND RETURN THIS TO DEPOSITOR FOR HIS RETAINED COPY

Idm E-32	Banner Min.	5,312.00

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
WASHINGTON 25, D. C.

Surname copy
F L Knouse
Ellis
Chambers
F E Johnson
Selfridge

JAN 31 1955

Mr. A. B. Bowman
Vice President and General Manager
Banner Mining Company
2042 Conner Stravenue
Tucson, Arizona

JAN 31 1955

Re: Docket No. DMA-269X-A (Copper)
Contract No. I-DMA-E32
Mineral Hill Copper Mine
Pima County, Arizona

Dear Mr. Bowman:

This is in response to your letter of January 13, 1955, regarding the method to be used in calculating royalties for ore produced that is subject to the repayment provisions of the above-referenced contract.

Although we had hoped, as indicated in my letter of December 23, 1954, that you would adopt the method of calculation used by all of our other operators, since it appears from your letter of November 23, 1954, to Mr. King, that the entire amount of the Government's participation will be repaid during this year, we will tentatively accept your present method of calculating royalties. However, the Government reserves the right to further review and reopen the matter whenever it may appear in its best interest to do so.

With respect to hauling and trucking charges, I wish to point out that such charges may be deducted from the gross value in computing royalties due the Government only when they are paid directly to a common carrier by the purchaser of the material sold. Your attention is also called to the fact that all of your production and royalty records are subject to audit by the Government.

Sincerely yours,

C. O. Mittendorf
Administrator

FLKnouse/JLHofflund/FEJohnson,emd/gla
1-28-55

Copy to: DMEA Docket
Solicitor's Docket
Adm. Reading File
Operating Committee
Field Team, Region III (2)
Mr. Kiilsgaard, Rm. 5224
Mr. Johnson, Rm. 3621

Code 700
Mr. Johnson, Rm. 4460
J. L. Hofflund
J. L. Chambers
Mr. Knouse

Docket copy
Surname: ~~F. L. Knouse~~
~~Ellis~~
Rewritten by: Hofflund

140

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
WASHINGTON 25, D. C.

Mr. A. B. Bowman
Vice President and General Manager
Banner Mining Company
2042 Conner Stravenue
Tucson, Arizona

Re: Docket No. DMA-269X-A (Copper)
Contract No. I-DMA-E32
Mineral Hill Copper Mine
Pima County, Arizona

Dear Mr. Bowman:

In your letter to me of January 13 you request: "Please advise if we may have your approval for continuing our present method of royalty calculations."

Although we had hoped, as indicated in my letter of December 23, 1954, that you would adopt the method of calculation used by all of our other operators, yet we will accept payments based upon the method of calculating the royalties as indicated in your letter. We have come to this conclusion in view of the fact that it is the opinion of your attorney that your contract permits the calculation of royalty in the manner indicated, and by the further fact that it appears from your letter of November 23, 1954, to Mr. King that the entire amount of the Government's participation will be paid during the ensuing year.

Sincerely yours,

Administrator

FLKnouse/JLHofflund/emd
Copy to: DMEA Docket
Solicitor's Docket
Adm. R. File
Operating Committee
Field Team, Reg. III (2)
Mr. Kiilsgaard, Rm. 5224
Mr. Johnson, Rm. 3621

E. W. Ellis
J. L. Hofflund
J. L. Chambers
chron.
pending

Surname 700

F L Knouse

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
WASHINGTON 25, D. C.

Selfridge
Johnson
Northcutt

JAN 25 1955

Mr. William Traver
Executive Officer
DMEA Field Team, Region III
224 New Customhouse Building
Denver 2, Colorado

Re: Docket No. DMA-269X-A (Copper)
Contract I-DMA-E32
Banner Mining Company
Mineral Hill Copper Mine
Pima County, Arizona

Dear Mr. Traver:

This is in response to your memorandum of January 18, 1955, concerning the method the Operator is using to calculate the royalties due from production.

A letter is now being drafted to the Operator concerning this question and a copy will be mailed to you when it is mailed to the Operator.

We note your question concerning the smelter paying for the silver content in the ore. In reviewing the smelter settlement sheets we note they have allowed a credit of $0.885/ounce for the silver content in the ore after deducting five percent of the silver. In order for you to better understand the basis of the payments being made by the smelter, we suggest that you request a copy of the smelter contract from the Operator.

Sincerely yours,

George C. Selfridge

Chairman, Operating Committee (GCS)

APPROVED:

J. H. Hedges
Member, Bureau of Mines (JH)

Thor H. Kiilsgaard
Member, Geological Survey (JH)

FLKnouse:am
1-24-55

cc to: Admr. Reading File
Operating Committee
Docket

Messrs: C. H. Johnson, Rm. 3621
T. H. Kiilsgard, Rm. 5224
Code 700
Mr. Knouse

A.S.S.

For Certificate of Deposit No. 64, dated January 19, 1955, giving royalty repayment of $6,210.40, see E-4.

1/17/55 gla

BANNER MINING COMPANY

2042 CONNER STRAVENUE TUCSON, ARIZONA PHONE 6-2971

A. B. BOWMAN
VICE-PRES. & GEN. MGR.

E. S. BOWMAN, PRESIDENT

Defense Minerals Administration
RECEIVED
JAN 17 1955

January 13,1955

Mr. C. O. Mittendorf, Administrator
Defense Minerals Exploration Administration
Washington 25, D.C.

Re: Docket DMA-269X-ACopper
Contract No. I-DMA-E-32
Mineral Hill Copper Mine

Dear Mr. Mittendorf:

This will acknowledge receipt of your letter of December 23, 1954 regarding royalties under Contract I-DMA-E-32.

Our attorney has studied the contract and advises me that it is his opinion that royalty is to be paid on the net smelter value of each ton of crude ore.

I feel that our auditors would object if I were to authorize payments not made in conformity with the contract.

The value of the silver and copper in our ores is in proportion to the grade of ore produced. However, the cost of producing each ton of ore and the milling of same does not go down whenever the grade is lower.

Mineral Hill Mine sulphide ores are marginal in character at best, so it does not seem quite proper for us to pay the highest royalty rate whenever the value is less than that which commands the highest royalty rate according to the table of royalties listed in our contract.

Regarding the freight from our mill to the railroad on the concentrates, I wish to advise that we were informed by Mr. W. H. King of your Denver office on July 3, 1953 that haulage and trucking charges may be deducted from the gross value if they are paid by the purchaser or the smelter as the case happened to be. I am enclosing a copy of this letter from Mr. King.

Estimated royalties due the government on production through December 1954 totals over $34,000.00 and will be paid as payments for our refined copper are received from the government.

I am enclosing a royalty statement covering July production of Mineral Hill concentrates. Our check in the amount of $6,210.40 was sent to the Denver office of DMEA today.

Our production is continuing on a basis of about 12,000 tons per month.

Please advise if we may have your approval for continuing our present method of royalty calculations.

Sincerely yours,

BANNER MINING COMPANY

A. B. Bowman
Vice President

ABB: d
enc: 2

C
O
P
Y

UNITED STATES
DEPARTMENT OF THE INTERIOR
Defense Minerals Exploration Administration
Washington 25, D.C.

224 New Customhouse
Denver 2, Colorado

July 3, 1953

Mr. W. H. Hardy
Assistant Treasurer
Banner Mining Company
550 First National Building
Oklahoma City, Okla

Re: Contract I-DMA-E33

Dear Mr. Hardy:

We have received settlement sheets covering nine shipments of ore from the Banner Mining Company during the period from March 27, 1953 to April 27, 1953, and settlement sheets covering nine shipments of ore for the month of May, 1953.

The total royalty paid on the first group of shipments was $286.48. The total royalty on the second group of shipments was $402.99. The charges for trucking the ore from the mine to the railroad was not deducted in calculating the net smelter value per ton for the purpose of determining the royalty rate and the net value upon which the royalty is computed. The haulage and trucking charges may be deducted from the gross value if paid by the purchaser; in this case the smelter, in determining the royalty rates as well as the amount of the royalty due the Treasurer of the United States.

We have recalculated the amount of royalty due the Government on this basis. A copy of each of our calculation sheets is attached. According to our calculations, the Banner Mining Company made an overpayment of $49.71 in the first group of shipments and an overpayment of $30.50 in the second group. The amount of overpayment of $80.21 may be deducted from your next royalty check.

Yours very truly,

/s/ W. H. King
Executive Office
Field Team, Region IV

Royalty Statement
Re: Contract No. I-DMA-E32

BANNER MINING COMPANY
2042 Corner Stravenue
Tucson Arizona

MINERAL HILL CONCENTRATES SHIPPED TO THE EL PASO SMELTING WORKS
July 1954

Date of Arrival at Smelter	Car No.	Lot Nos. Banner	Lot Nos. Smelter	Dry Tons Conc	Refined Copper Lbs.	Refined Copper Value	Silver Ozs	Silver Value	Total Gross Value	Smelter Deductions	Net Smelter Value
7-5	S.P.90306	26	2144	49.9965	24,888	7,715.28	277.48	233.48	7,948.76	1,525.26	6,423.50
7-6	S.P.152876	27	2179	49.4485	25,298	7,842.38	271.97	228.45	8,070.83	1,533.56	6,537.27
7-9	S.P.152341	28	2202	50.9425	26,572	8,237.32	294.45	247.58	8,484.90	1,590.57	6,894.33
7-12	S.P.152946	29	2226	46.6440	21,904	6,790.24	240.22	201.97	6,992.21	1,388.20	5,604.01
7-13	S.P.152781	30	2246	48.7920	22,044	6,833.64	223.96	188.34	7,021.98	1,420.92	5,601.06
7-13	S.P.152910	31	2249	48.9425	22,083	6,845.73	234.92	197.73	7,043.46	1,422.32	5,621.14
7-14	S.P.150974	32	2269	49.1915	23,002	7,130.62	245.96	206.60	7,337.22	1,459.84	5,877.38
7-16	S.P.46827	33	2301	47.1675	22,471	6,966.01	228.76	192.44	7,158.45	1,413.45	5,745.00
7-16	S.P.152282	34	2302	48.6590	23,969	7,430.39	240.86	202.42	7,632.81	1,474.57	6,158.24
7-19	S.P.94647	35)									
7-19	S.P.151593	36	2329	98.2550	48,145	14,924.95	501.10	421.51	15,346.46	2,977.37	12,369.09
7-19	S.P.46337	37)									
7-22	S.P.95376	38	2339	97.6810	47,580	14,749.[illegible]	493.29	415.14	15,164.94	2,948.23	12,216.71
7-26	S.P.152823	39)									
7-26	S.P.92833	40	2412	106.8155	51,442	15,947.[illegible]	566.12	476.40	16,423.42	3,199.20	13,224.22
7-27	S.P.351994	41)									
7-29	S.P.352899	42	2432	103.5960	49,405	15,315.[illegible]	537.98	435.10	15,750.65	3,092.70	12,657.95
8-5	S.P.91972	43)									
8-2	S.P.152618	44	2515	104.0620	50,158	15,540.[illegible]	567.14	476.60	16,025.58	3,107.62	12,917.96
8-6	S.P.151308	45	2575	52.9965	24,781	7,682.[illegible]	283.53	238.48	7,920.59	1,560.51	6,360.08
				1003.1900	483,742	149,960.[illegible]	5,187.74	4,362.24	154,322.25	30,114.32	124,207.94

Royalty Calculation

$124,207.94 ÷ 10002 Tons Milled = $12.42 Net Value per ton

5% x $124,207.94 = $6,210.40 Royalty Payment on July Production

RECEIVED
JUN 1 7 1955

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
WASHINGTON 25, D. C.

F L Knouse
Ellis
Selfridge
Johnson
Northenday

DEC 23 1954

DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADM.

14X1401(01) Revolving Fund, Defense Production Act, Interior (Allocated Working Fund to the Office of the Secy.)

T E L E T Y P E

W. H. KING, EXECUTIVE OFFICER
DMEA FIELD TEAM, REGION IV
224 NEW CUSTOMHOUSE BUILDING
DENVER 2, COLORADO

REURTT DECEMBER 22 DMA-269X-A BANNER MINING COMPANY LETTERS TO YOU AND OPERATOR MAILED TODAY.

George C. Selfridge
GEORGE C. SELFRIDGE
CHAIRMAN, OPERATING COMMITTEE

FLKnouse/gla
12-23-54
cc to: Admr. Reading File
Operating Committee
Docket
Code 700 contract file
Mr. Knouse
Confirmation to Region IV, DMEA

R.C.B.

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
WASHINGTON 25, D. C.

J. P. Krause
Ellis
Selfridge
Hofman
Mathendorf

DEC 23 1954

Mr. W. H. King
Executive Officer
DMEA Field Team, Region IV
224 New Customhouse Building
Denver 2, Colorado

Re: Docket No. DMA-269X-A (Copper)
Banner Mining Company
Mineral Hill Copper Mine
Pima County, Arizona
Contract No. I-DMA-532

Dear Mr. King:

Reference is made to your memorandum to the Operating Committee dated November 30 to which you attached a copy of a letter from the Operator dated November 23, all relating to the method of computing royalties due to the Government from the Operator. Attached hereto is a copy of the Administrator's letter to the Operator which is intended to resolve and settle this matter.

This treatment of the matter is pursuant to the last paragraph of DMEA Circular 32, Supplement No. 2. It was recognized when DMEA Circular 32, Supplement No. 2 was promulgated that operators under the earliest contract forms might object to computing their royalties in the manner stated by the circular. We recognize that this operator's construction of this early contract form is justified, and believe that we should not contest it.

As indicated in the letter to the Operator, we have no intention to demand that he change his method of royalty calculation, however we do relate what has been done to clarify ambiguities with the hope that he might also "fall in line." If he does not choose to do so, then there is little we can do about the matter. We note that it appears likely that the entire amount due the Government will be paid at an early date regardless of the method used in computing the royalty.

It seems unlikely at this late date that the question is apt to arise again on the few outstanding contracts remaining on the early contract

R.C.S.

forms. If it does arise again, the matter should be submitted here as in this case and handled directly with the operator by this office.

Sincerely yours,

George C. Selfridge

Chairman, Operating Committee (216)

Enclosure

APPROVED:

C. H. JOHNSON (216)

Member, Bureau of Mines

Thor H. Kiilsgaard (216)

Member, Geological Survey

JLHofflund/FEJohnson/COMittendorf/emd/am
(12/13/54) 12/15/54

Copy to: DMEA Docket ✓
Solicitor's Docket
Adm. R. File
Operating Committee
Field Team, Reg. I V(2)
Mr. Kiilsgaard, USGS
Mr. Johnson, USBM
E. W. Ellis
J. L. Hofflund
J. D. Parriott
F.L. Knouse

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
WASHINGTON 25, D. C.

Kulsgaard
Selfridge
Johnson
J E Johnson

DEC 23 1954

Mr. A. B. Bowman, Vice President
Banner Mining Company
2042 Connor Straveme
Tucson, Arizona

Re: Docket No. DMA-269X-A (Copper)
Contract No. I-DMA-E32
Mineral Hill Copper Mine
Pima County, Arizona

Dear Mr. Bowman:

Your letter of November 23 to Mr. W. H. King, Executive Officer, DMEA, at Denver, Colorado, enclosing checks in payment of royalties due to the Government and a calculation sheet showing how the royalties were computed, have been referred to this office.

We note that some question has arisen as to whether the rate of royalty is to be calculated upon a crude ore, concentrate, or metal value basis.

Your contract was written on the earliest form which was used by this Administration in contributing to the costs of exploration. You say in your letter:

> "We have made a very careful study of our contract and find that it refers directly to the net smelter value of each ton of crude ore in arriving at the percentage royalty to be paid in each instance."

By the time the DMEA was established in November 1951, we recognized that the repayment articles of the earlier DMA forms were susceptible to different legal interpretations.

I have always considered that the basic intent of these contract articles was that royalty should be due the Government upon "gross revenue from sales," which gross amount would ordinarily be compatible with the sum used for the calculation of depletion allowances for income tax purposes. Also, that the percentage figure applied to that sum should be based on the unit value of the product sold, in the form sold, and be consistent with industry practice in most lessor-lessee relationships. Our next contract form issued during February 1952 more clearly spelled out that intent.

R.C.S.

As the exploration program progressed it became apparent that there was no strict "industry practice" which could be expressed concisely in the contract form and still be applied uniformly to a program of this magnitude where so many commodities are marketed; and even where an individual commodity can be marketed in different forms. For instance, it would be wholly impracticable, and contrary to industry practice, to exploit a pegmatite formation for strategic mica and then calculate royalties on the basis of the value of sheet mica sold divided by gross tonnage of pegmatite mined.

We also learned that, even within the non-ferrous metals industry, the interpretation of the term "net smelter returns" has been the subject of legal action between lessors-lessees in many instances.

To clarify these situations the DMEA has more clearly spelled out the royalty provisions of the earlier contracts through the medium of Contract Annexes and has expanded the original repayment language accordingly as individual contracts were amended from time to time.

However, the fact remains that the Banner Mining Company contract number I-DMA-E32 has never been amended so as to afford the opportunity to clarify the royalty provisions and, therefore, any ambiguities recognized in the earlier forms still remain before us at this time. In rare instances, when dealing with cases identical to yours, we have either been requested by the operator to give our interpretation of the repayment articles or we have done so voluntarily. In so doing we have cited the provisions of Section 10 of DMEA Order-1, Amended, a copy of which is enclosed for your information.

As a consequence, repayments from all of the other 227 projects which have reported production are being made on a uniform basis, and in no instance is an operator applying a percentage figure based on the calculated value of the crude ore in a case where a concentrate, metal, or other beneficiated product is sold.

I note from the production data you have reported in your letter to Mr. W. H. King, dated November 23, 1954, that the weighted value of the 60,332 tons milled during the period between May and October is about $10.78 per ton. I also note from the A.S. & R. settlement sheets that trucking charges to the railhead are treated as a smelting charge. It is possible that these hauling charges may be considered as an operating cost when our representative audits your production-royalty account, which would add approximately $1.00 per ton to the value of the crude ore as reported by you. This would increase the weighted value of the ore to above $11.50 per ton, at which figure the 5 percent royalty is applicable.

In view of that eventuality and the other considerations herein stated, I wonder if you agree that, for all practical purposes, it would be administratively expedient to calculate royalties at a uniform 5 percent of the net proceeds received from GSA, less toll charges by A.S.& R. I shall be pleased to receive your reactions to this suggestion.

Sincerely yours,

C. O. Mittendorf (for)

Administrator

Enclosure

JLHofflund/FEJohnson/COMittendorf/emd/gla
(12/13/54, 12/15/54) 12/20/54

Copy to: DMEA Docket
Solicitor's Docket
Admr. Reading File
Field Team, Region IV (2)
Mr. Kiilsgaard, USGS
Mr. Johnson, USBM
E. W. Ellis
J. L. Hofflund
J. D. Parriott
F. L. Knouse

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
WASHINGTON 25, D. C.

F. L. Krause

Mr. A. B. Bowman, Vice President
Banner Mining Company
2042 Connor Stravenue
Tucson, Arizona

Re: Docket No. DMA-269X-A (Copper)
Contract No. I-DMA-E32
Mineral Hill Copper Mine
Pima County, Arizona

Dear Mr. Bowman:

Your letter of November 23 to Mr. U. H. King, Executive Officer, DMEA, at Denver, Colorado, enclosing checks in payment of royalties due to the Government and a calculation sheet showing how the royalties were computed, have been referred to this office.

We note that some question has arisen as to whether the rate of royalty is to be calculated with reference to the net smelter returns or with reference to the tons of ore which were processed in producing the metal.

Your contract was written on the earliest form which was used by this Administration in contributing to the costs of exploration. You say in your letter:

> "We have made a very careful study of our contract and find that it refers directly to the net smelter value of each ton of crude ore in arriving at the percentage royalty to be paid in each instance."

By the time the DMEA was established in November 1951, we recognized that the repayment articles of the earlier DMA forms were susceptible to different legal interpretations.

I have always considered that the basic intent of these contract articles was that royalty should be due the Government upon "gross revenue from sales," which gross amount would ordinarily be compatible with the sums used for the calculation of depletion allowances for income tax purposes. Also, that the percentage figure applied to that sum should be based on the unit value of the product sold, in the form sold, and be consistent with industry practice in most lessor-lessee relationships. Our next contract form issued during February 1952 more clearly spelled out those intents.

As the exploration program progressed it became apparent that there was no strict "industry practice" which could be expressed concisely in the contract form and still be applied uniformly to a program of this magnitude where so many commodities are marketed; and even where an individual commodity can be marketed in different forms. For instance, it would be wholly impracticable, and contrary to industry practice, to exploit a pegmatite formation for strategic mica and then calculate royalties on the basis of the value of sheet mica sold divided by gross tonnage of pegmatite mined.

We also learned that, even within the non-ferrous metals industry, the interpretation of the term "net smelter returns" has been the subject of legal action between lessors-lessees in many instances.

To clarify these situations the DMEA has more clearly spelled out the royalty provisions of the earlier contracts through the medium of Contract Annexes and has expanded the original repayment language accordingly as individual contracts were amended from time to time.

However, the fact remains that the Banner Mining Company contract number I-DMA-E32 has never been amended so as to afford the opportunity to clarify the royalty provisions and, therefore, any ambiguities recognized in the earlier forms still remain before us at this time. In rare instances, when dealing with cases identical to yours, we have either been requested by the operator to give our interpretation of the repayment articles or we have done so voluntarily. In so doing we have cited the provisions of Section 10 of DMEA Order-1, Amended, a copy of which is enclosed for your information.

As a consequence, repayments from all of the other 227 projects which have reported production are being made on a uniform basis, and in no instance is an operator applying a percentage figure based on the calculated value of the crude ore in a case where a concentrate, metal, or other beneficiated product is sold.

I note from the production data you have reported in your letter to Mr. W. H. King, dated November 23, 1954, that the weighted value of the 60,332 tons milled during the period between May and October is about $10.78 per ton. I also note from the A.S. & R. settlement sheets that trucking charges to the railhead are treated as a smelting charge. It is quite probable that these hauling charges will be considered as an operating cost when our representative audits your production-royalty account, which would add approximately $1.00 per ton to the value of the crude ore as reported by you. This would increase the weighted value of the ore to above $11.50 per ton, at which figure the 5 percent royalty is applicable.

In view of that eventuality and the other considerations herein stated, I wonder if you agree that, for all practical purposes, it would be administratively expedient to calculate royalties at a uniform 5 percent of the net proceeds received from GSA, less toll charges by A.S.& R. I shall be pleased to receive your reactions to this suggestion.

Sincerely yours,

Administrator

Enclosure

JLHofflun/FEJohnson/COMittendorf/emd/gla
(12/13/54, 12/15/54) 12/20/54

Copy to: DMEA Docket
Solicitor's Docket
Admr. Reading File
FieldTeam, Region IV (2)
Mr.Kiilsgaard, USGS
Mr. Johnson, USBM
E. W. Ellis
J. L.Hofflund
J. D. Parriott
F. L. Knouse

J. I. Kraus
Ellis

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
WASHINGTON 25, D. C.

Mr. A. B. Bowman, Vice President
Banner Mining Company
2042 Conner Stravenue
Tucson, Arizona

Re: Docket No. DMA-269X-A (Copper)
Mineral Hill Copper Mine
Pima County, Arizona
Contract No. I-DMA-E32

Dear Mr. Bowman:

Your letter of November 23 to Mr. W. H. King, Executive Officer, DMEA, at Denver, Colorado, enclosing checks in payment of royalties due to the Government and a calculation sheet showing how the royalties were computed, have been referred to this office.

We note that some question has arisen as to whether the rate of royalty is to be calculated with reference to the net smelter returns or with reference to the tons of ore which were processed in producing the metal.

Your contract was written on the earliest form which was used by this Administration in contributing to the costs of exploration. You say in your letter:

> "We have made a very careful study of our contract and find that it refers directly to the net smelter value of each ton of crude ore in arriving at the percentage royalty to be paid in each instance."

By the time the DMEA was established in November 1951, we recognized that the repayment articles of the earlier DMA forms were susceptible to different legal interpretations.

Our administrative interpretation of the intent of these contract articles was that royalty should be due the Government upon "gross revenue from sales," which gross amount would ordinarily be compatible with the sums used for the calculation of depletion allowances for income tax purposes. Also, that the percentage figure applied to that sum should be based on the unit value of the product sold, in the form sold, and be consistent with industry practice in most lessor-lessee relationships. Our next contract form issued during February 1952 more clearly spelled out those intents.

As the exploration program progressed it became apparent that there was no strict "industry practice" which could be expressed concisely in the contract form and still be applied uniformly to a program of this magnitude where so many commodities are marketed; and even where an individual commodity can be marketed in different forms.

We also learned that, even within the non-ferrous metals industry, the interpretation of the term "net smelter returns" has been the subject of legal action between lessors-lessees in many instances. The DMEA does not, of course, desire to resort to that type of action, and we have more clearly spelled out the royalty provisions to make them entirely certain, and have changed the original repayment language accordingly as individual contracts were amended from time to time. As a consequence, repayments from 228 projects are being made on a uniform basis, without industry protest, and in no instance is any operator applying a percentage figure based on the value of crude ore in the case where concentrate or metal is sold. It would be appreciated if you could see fit to conform to that general practice.

Enclosed for your information is a copy of DMEA Order-1, Amended. Your attention is particularly directed to Sec. 10.

Sincerely yours,

Administrator

Enclosure

JLHofflund/FEJohnson/COMittendorf/emd/gla
(12/13/54) 12/15/54

Copy to: DMEA Docket
Solicitor's Docket
Adm. R. File
Operating Committee
Field Team, Reg. IV (2)
Mr. Kiilsgaard, USGS
Mr. Johnson, USBM
E. W. Ellis
J. L. Hofflund
J. D. Parriott
F. L. Knouse

Hotlund

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
WASHINGTON 25, D. C.

Mr. A. B. Bowman
Vice President
2042 Conner Stravenue
Tucson, Arizona

Re: Docket No. DMA-269X-A (Copper)
Mineral Hill Copper Mine
Pima County, Arizona
Contract No. I-DMA-E32

Dear Mr. Bowman:

Your letter of November 23 to Mr. W. H. King, Executive Officer, DMEA, at Denver, Colorado, enclosing checks in payment of royalties due to the Government and a calculation sheet showing how the royalties were computed, have been referred to this office.

We note that some question has arisen as to whether the rate of royalty is to be calculated with reference to the net smelter returns or with reference to the tons of ore which were processed in producing the metal.

Your contract was written on the earliest form which was used by this Administration in contributing to the costs of exploration. You say in your letter:

> "We have made a very careful study of our contract and find that it refers directly to the net smelter value of each ton of crude ore in arriving at the percentage royalty to be paid in each instance."

We believe that this early form of contract is susceptible to the construction you have put upon it, and we are not inclined to dispute it. Our later contract forms have spelled out the royalty provisions and I believe have made them entirely certain in this respect. We are somewhat aided in agreeing with your construction of this early form by the fact that it appears very likely that the Government will be fully repaid at an early date regardless of the method of computing the rate of royalty.

In view of the foregoing, we have no objection to the method of calculating royalties under this contract as shown by your calculation sheet and smelter settlement sheets, and accept your checks accordingly. We also thank you for the payments and for supplying us with copies of the documents on which they are based.

Sincerely yours,

Administrator

JLHofflund/emd 12/13/54

Copy to: DMEA Docket
Solicitor's Docket
Adm. R. File
Operating Committee
Field Team, Reg. IV (2)
Mr. Kiilsgaard, USGS
Mr. Johnson, USBM
E. W. Ellis
J. L. Hofflund
chron.
pending
J. D. Parriott

Surname copy

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
WASHINGTON 25, D. C.

Ellis
Chandler
Selfridge
Johnson
Talbut
Matthews

Mr. W. H. King
Executive Officer
DMEA Field Team, Region IV
224 New Customhouse Building
Denver 2, Colorado

Re: Docket No. DMA-269X-A (Copper)
Contract No. I-DMA-E32
Banner Mining Company
Mineral Hill Copper Mine
Pima County, Arizona

Dear Mr. King:

This will acknowledge receipt of your memorandum dated November 30, together with copy of Operator's letter of November 23, 1954, and smelter settlement sheets for May and June for the captioned project.

We note that the Operator bases the royalty calculations on the recovered value per ton of crude ore. We further note that you believe the royalty should be based on the gross value of the concentrates before any deduction for hauling, concentrating, and smelter charges.

Since this contract was prepared on one of the earliest forms, it is readily understood how some shippers of concentrate might base their royalty calculations on the average value per ton of crude ore. Only if the Operator was shipping crude ore would that be the case. However, when concentrates are shipped, it was not the intention to calculate royalties on ore mined. The method for calculating royalties is more clearly stated in the later contract forms and in DMEA Circular 32, Supplement No. 2. On the other hand, to calculate royalties as you suggest, without making the regular buyers' smelting deductions, might work a hardship on some shippers. We believe that the subject project shipments should be treated as though the shipper were receiving the net smelter value as shown on the settlement sheets for May and June, which, as a matter of fact, he is. Consequently, we feel that a just settlement would be to take 5 percent of the net return for May and for June since both values, figured back to per ton of concentrate, are in excess of the base price ($11.50) per ton. Thus, you would have the following:

5 percent of	$43,544.45 equals	$2,177.22
5 percent of	$100,634.90 equals	$5,031.75
	Total	$7,208.97

This would leave a royalty due for those two months in the amount of $2,530.40, $4,678.57 having been paid.

We note from the Operator's letter of November 23 that shipments were made for July, August, September, and October, and the royalties calculated on a per ton of crude ore basis. Evidently you have not yet received said royalties. It is hoped that the Operator will recalculate the royalties on the basis shown above and submit the amount due in order that we may keep our receivables current.

Sincerely yours,

George C. Selfridge (24B)
Chairman, Operating Committee

APPROVED:

J. H. Hedges
Member, Bureau of Mines (24B)

Thor H. Kiilsgaard
Member, Geological Survey (24B)

EWEllis/JLChambers,FEJohnson/gla
12/3/54
12/6/54
cc to: Admr.'s Reading File
Operating Committee
Docket
Messrs. C. H. Johnson, Rm. 3621
T. H. Kiilsgaard, Rm. 5224
J. L. Chambers, Rm. 4448
Code 700

Chairman, Opr. Comm. D.M.E.A.
12-22-54
3:41 P.M.

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
DEC 22 1954

DN 235 BUREAU MINES 12-22-54 1-41 PM

CHAIRMAN, OPERATING COMMITTEE, DMEA

RE OUR MMXXX MEMO NOVEMBER 30,1954 DOCKET NO. DMEA 269XA, CONTRACT IDM-E32 /COPPER/ BANNER MINING COMPANY, COPPER HILL MINE, PIMA COUNTY, ARIZONA. PLEASE ADVISE US AMOUNT OF ROYALTY DUE THE GOVERNMENT ON TH E OPERATOR S SHIPMENTS OF ORE FOR THE MONTHS OF MAY AND JUNE, 1954.

W H KING

Denver, Colo.

For Certificate of Deposit No. 52, dated December 2, 1954, giving royalty repayment of $4,678.57, see E-4.

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
WASHINGTON 25, D. C.

Defense Minerals Administration
RECEIVED
NOV 8 - 1954

224 New Customhouse
Denver 2, Colorado

November 5, 1954

Memorandum

To: Chairman, Operating Committee

From: Executive Officer, DMEA Field Team, Region IV

Subject: Docket No. DMA-269X-A (Copper) Contract I-DMA-E32, Banner Mining Company, Mineral Hill Copper Mine

Reference is made to your letter dated November 1, 1954, regarding the payment of royalty by the Banner Mining Company under contract I-DMA-E32.

The Chief of the Mining Methods Branch, Mining Division, Region IV, discussed the matter of royalty payments with Allen Bowman, manager of the Banner Mining Company, during the week of October 11, 1954. Mr. Bowman stated that the company's first invoice for payment on its copper production was sent to the General Services Administration in Washington in August. It requires the minimum of 90 days for payment by the G.S.A.

Mr. Bowman will commence making royalty payments under contract I-DMA-E32 as soon as he receives payment from the G.S.A.

John F. Shaw
for W. H. King

Surname copy 700

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
WASHINGTON 25, D. C.

F.L. Knouse
Ellis
Selfridge
J.E. Murdock
Mattendorf

NOV 1 - 1954

Mr. W. H. King
Executive Officer
DMEA Field Team, Region IV
224 New Customhouse Building
Denver 2, Colorado

Re: Docket No. DMA-269X-A (Copper)
Contract I-DMA-E32
Banner Mining Company
Mineral Hill Copper Mine
Pima County, Arizona

Dear Mr. King:

This is with reference to your memorandum dated October 11, which transmitted memoranda from Mr. W. R. Storms and Mr. William R. Hardwick, both dated August 3, concerning the inspection of the subject project on July 8, 1954.

You will note from the above dates that considerable time has elapsed from the inspection date until the report was transmitted by you to Washington. In order for us to keep our records current such reports should be sent to us with a minimum of delay.

In this connection we note in Mr. Hardwick's report that no royalties have been paid on production from this project, and our records show no royalties paid to date. Please investigate this question and report the results of your inquiry.

Sincerely yours,

George C. Selfridge

Chairman, Operating Committee (GCS)

APPROVED:

J. H. Hedges
Member, Bureau of Mines (JHH)

Thor H. Kiilsgaard
Member, Geological Survey (THK)

FLKnouse/gla
10-28-54
cc to: Admr. Reading File
Operating Committee
Docket
Messrs. C. H. Johnson, Rm. 3621
T. H. Kiilsgaard, Rm. 5224
Code 700
Mr. Knouse

R.C.H.

FILE COPY
SURNAME:

Chambers

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION
WASHINGTON 25, D. C.

JAN 27 1954

Mr. Thomas N. Breding
DMEA Auditor
224 New Customhouse Building
Denver 2, Colorado

Re: Contract Idm-E32, DMA-269XA
Contract Idm-E33, DMA-269XB
Banner Mining Company

Dear Mr. Breding:

I am sending you a letter received from L. N. Treadaway and Associates, Certified Public Accountants, Tucson, Arizona, requesting a confirmation of an account between the Banner Mining Company and the United States Government. Please furnish the Company the information which it has requested.

Sincerely yours,

(Signed) J. L. Chambers

Jay L. Chambers, Chief
Contract Administration
and Audit Division

Enclosure

JLChambers/wb
January 27, 1954

Copy to: Docket
Admr. Reading File
Mr. Chambers
L. N. Treadaway & Associates
P. O. Box 1704
Tucson, Arizona

R.C.G.
1-28-54

GENERAL SERVICES ADMINISTRATION

Emergency Procurement Service
Washington 25, D. C.

RECEIVED
JAN 13 1954

January 12, 1954

In Reply Refer To: EDE

Mr. C. O. Mittendorf
Administrator
Defense Minerals Exploration Administration
U. S. Department of Interior
Washington 25, D. C.

Re: Docket No. DMA-269X-A (Copper)
Contract No. Idm-E32
Banner Mining Company
Mineral Hill Copper Mine
Pima County, Arizona

Dear Mr. Mittendorf:

This will acknowledge receipt of your letter of January 4, 1954, addressed to Mr. Irving Gumbel on the above subject, setting forth the results of the exploration work now completed.

Thank you for this information.

Very truly yours,

Clarence A. Fredell

Clarence A. Fredell
Acting Chief
Expansion Branch

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
WASHINGTON 25, D. C.

Mr. Irving Ginnel, Acting Director
Materials Division
Emergency Procurement Services
General Services Administration
Washington 25, D. C.

JAN - 4 1954

Re: Docket No. MA-269[illegible] (Copper)
Contract No. Idm-32
Tanner Mining Company
Mineral Hill Copper Mine
Pima County, Arizona

Dear Mr. Ginnel:

This is with reference to our letter dated [illegible], 1953, addressed to Mr. Donald Waite, Acting Administrator, Defense Materials Procurement Agency. In that letter we attached thereto a copy of the final field item report on the captioned project so that it could be forwarded to him as soon as it was received in Washington.

As the procedure of forwarding copies of the final field item report has been discontinued in favor of a brief description of the work provided for in the contract, and work and results accomplished, we are setting forth this information below:

The contract was signed June 29, 1951, and provided for reopening of and rehabilitating the Mineral Hill Mine to make the workings accessible for a geological study, sampling of the reported ore bodies, and drifting, crosscutting and diamond drilling to explore for additional ore bodies. The Government participation was 50 percent of $102,255.64, or $51,127.82, after crediting salvage value of installations and equipment. The work completed under the contract consisted of improvement to surface plant, unwatering, and rehabilitation of 130 feet of an inclined shaft, and rehabilitation of 1,101 feet of drifts, crosscuts, and raises on the 100, 400, and 500-foot levels. The mine workings on the 300, 500, 600, and 700-foot levels were surveyed and mapped and the ore bodies sampled. Before all the work set forth in the contract was completed the funds were exhausted and the operator is continuing to perform work at the mine at his expense.

The exploration work resulted in a discovery or development of measured, indicated, and inferred ore reserves, ranging in amounts from 151,261 tons as estimated by the examining engineers and geologists, to 229,400 tons as estimated by the operator. The average grade of the ore reserves, as calculated from some 500 of the operator's samples, was 0.70 ounces silver per ton, 2.61 percent copper, 0.05 percent MoS_2, and 0.05 percent WO_3.

Sincerely yours,

R. C. Hittendorf (for)

Administrator

Messrs: C.H. Johnson, Rm. 3621
A.R. Kinkel, Jr., Rm. E-242A, GSA
Ellis
Knouse

Operating Committee
Docket
BMEA Field Team, Region IV (2)

FLKnouse/gla/db
12-22-53
cc to: Adm. Reading File

Docket
LEB
FL Knouse
Ellis
Lavrader
Hedges
Selfridge

R.C.H.
1-4-54

mbl

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
WASHINGTON 25, D. C.

DEC 8 - 1953

224 New Customhouse
Denver 2, Colorado

December 7, 1953

Memorandum

To: Secretary to the Operating Committee, DMEA

From: Executive Officer, DMEA Field Team, Region IV

Subject: Docket DMA 269XA (Copper), Contract I-DMA-E32, Banner Mining Company, Mineral Hill Copper Mine, Pima County, Arizona

In conjunction with material forwarded by the memorandum from the Field Team, Region IV, dated October 5, 1953, we are enclosing the original and three copies of the final geologic report by the U.S. Geological Survey pertaining to the results of work completed under the subject contract.

W H King
W. H. King

Enclosures

13

Final Geological rpt with Mines Final rpt. (Combined)

Reviewed by
DMEA OPERATING COMMITTEE
12-16-53
(date)

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
WASHINGTON 25, D. C.

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
OCT - 8 1953

224 New Customhouse
Denver 2, Colorado

October 6, 1953

Memorandum

To: C. O. Mittendorf, Administrator, DMEA

From: Executive Officer, DMEA Field Team, Region IV

Subject: Docket No. DMA 269X-A (Copper), Contract I-DMA-E32, Banner Mining Company, Mineral Hill Copper Mine, Yuma County, Arizona

Reference is made to our memorandum of October 5, 1953, by which we transmitted the original and one copy of the operator's final report and the original and three copies of the final engineering report with advice that the geologic report by the U.S. Geological Survey would be forwarded when available.

For record purposes we are not considering the project account closed until we have submitted the final geologic report.

W. H. King

W. H. King

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
WASHINGTON 25, D. C.

224 New Customhouse
Denver 2, Colorado

Defense Minerals Administration
RECEIVED
OCT - 8 1953

October 5, 1953

Memorandum

To: Secretary to the Operating Committee, DMEA

From: DMEA Field Team, Region IV

Subject: Docket No. DMA 269X-A (Copper), Contract I-DMA-E32, Banner Mining Company, Mineral Hill Copper Mine, Pima County, Arizona

Enclosed are the following final reports pertaining to work under the subject contract:

1. Original and one copy of the operator's final report, with attached maps.

2. Original and three copies of the final engineering report by the Bureau of Mines.

The final geologic report by the U.S. Geological Survey will be forwarded when it is made available to this office.

Work completed was in conformance with the contract and the operator has complied with all of the contract requirements. Form MF-104, Operator's Monthly Progress Report and Voucher for the month of December 1952, which constituted the final accounting report, was processed in this office June 1, 1953, in conformance with the report of final audit by the Contract Administration and Audit Division, dated May 5, 1953, which was released to this office May 28, 1953.

The reported cost of the project, after liquidation of the jointly owned property, amounted to $102,255.64, in which the Government participated to the extent of 50%, or an amount of $51,127.52.

The exploration work resulted in a discovery or development of measured, indicated and inferred ore reserves, ranging in amount from 451,261 tons as estimated by the examining engineer, to 529,400 tons as estimated by the operator. The average grade of the ore reserves, as calculated from some 500 of the operator's samples, was 0.78 ounces silver per ton, 2.61 percent copper, 0.05 percent WO_3, and 0.05 percent MoS_2.

W. H. King
W. H. King

A. H. Koschmann
A. H. Koschmann

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
WASHINGTON 25, D. C.
Denver Federal Center
Denver 2, Colorado

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
DEC 8 1953

December 4, 1953

Memorandum

To: DMEA Field Team, Region IV

From: A. H. Koschmann

Subject: DMA Docket 269XA, Banner Mining Company, Mineral Hill Mine, Pima County, Arizona

Enclosed are 9 copies of the final geologic report by Raymond F. Robinson of the U. S. Geological Survey covering the above docket.

Mr. Robinson has estimated that there are 381,601 tons of indicated ore averaging 2.78% copper and 66,660 tons of inferred ore and a certificate of discovery is warranted.

A. H. Koschmann

A. H. Koschmann
Supervising Geologist
Colorado-Wyoming

Enclosures (9)

Reviewed by
DMEA OPERATING COMMITTEE
12-16-53
(date)

IN REPLY REFER TO:

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
P.O. Box 4126, University Station
Tucson 5, Arizona

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
DEC 9 - 1953

September 4, 1953

Memorandum

To: A. H. Koschmann

From: R. F. Robinson

Subject: DMA 269X, Banner Mining Company, Mineral Hill Mine, Pima County, Arizona

Enclosed please find the original and 8 copies of the finalization report on the geology of the Mineral Hill Mine by Raymond F. Robinson.

Raymond F. Robinson

Raymond F. Robinson
Acting District Supervisor
Arizona - New Mexico

Enclosures 9

Reviewed by
DMEA OPERATING COMMITTEE
12-16-53
(date)

SEP 1953
RECEIVED
U.S. Geological Survey
Mineral Deposits Branch
Denver

GEOLOGICAL REPORT FOR THE FINALIZATION OF THE CONTRACT BETWEEN THE GOVERNMENT AND THE BANNER MINING COMPANY AT THE MINERAL HILL MINE

PIMA COUNTY, ARIZONA

DMA 269XA

By Raymond F. Robinson
U. S. Geological Survey

Reviewed by
DMEA OPERATING COMMITTEE

12-16-53
(date)

OUTLINE AND TABLE OF CONTENTS

	Page
SCOPE OF THE GEOLOGIC WORK	1
AREAL GEOLOGY	2
HISTORY OF THE MINERAL HILL PROPERTY	6
MINE GEOLOGY	8
Surface Geology	8
Underground Geology	10
Stratigraphy and Rock Types	10
Quartzite	11
Limestone	11
Tactite	13
Igneous Rocks	14
Folding	15
Faulting	16
Alpha-Beta faults	17
North-South faults	20
North-Dipping faults	21
Flat South-Dipping faults	22
Tactite breccia zone	22
San Xavier thrust fault - regional thrust	23
Relative ages of faulting	24
Alteration (megascopic analysis)	25
Contact Metamorphism	25
Chloritization	26
Silicification	27
Hydrothermal alteration	27
The Mineral Deposits	28
Copper Ore Bodies	28
1. Ore bodies resulting from replacement of Naco Limestone	29
2. Chloritic Bodies	29
3. Massive Tactite Bodies	30
Ore Controls	30
Mineralogy	32
Paragenesis from field relationships	34
Secondary enrichment or impoverishment	34
ORE RESERVES	35
EXPLORATION POSSIBILITIES	38
SUMMARY AND CONCLUSIONS	39

ILLUSTRATIONS TO ACCOMPANY REPORT

FIGURE 1 Surface Geology after B. W. Venable (5), scale 1" = 100'

FIGURE 1A Surface Geology after M. N. Mayuga (2), scale 1" = 1250'

FIGURES 2 through 5 Geologic plans of 300, 500, 600, and 700 levels by R. F. Robinson. Scale 1" = 20'

FIGURES 6 through 12 Vertical geologic cross sections through the various ore bodies in the Mineral Hill Mine. Geology and interpretations by R. F. Robinson. Scale 1" = 50'

FIGURE 13 Longitudinal vertical section through the Mineral Hill Mine showing the ore reserves on the various ore bodies. Scale 1" = 50'. By R. F. Robinson.

SCOPE OF GEOLOGIC WORK

This final geologic report is the result of 8 days work of underground mapping over a period of 3 months at the Mineral Hill Mine of the Banner Mining Company, Pima County, Arizona. It is not the result of an exhaustive geologic study and leaves much to be desired in many respects. The work has been confined to megascopic observations but due to the nature of the problems at the mine a more detailed investigation would certainly be warranted. Geologic work was hampered by the fact that the mine has been under water for many years so that the resulting coating of mud and oxides together with the dirt from recent operations provided very poor exposures throughout the mine. No geologic work has been done here by the U. S. Geological Survey prior to that done for this report.

Due to the limited amount of time which could be devoted to this project and the adverse factors mentioned above, detailed mapping of the actual ore mineralization was not attempted. Much of the ore is finely disseminated and its limits can be determined now only by sampling. Therefore the definition of the ore shoots in plan have been defined from the sampling by the Banner Hill Mining Company and this is believed to be accurate and satisfactory. Visual checks were made wherever possible and no difference of opinion existed regarding the plan of the ore shoots on the 300, 500, 600 and 700 levels.

An attempt was made to map most of the conspicuous faults, fractures, rock types and alteration types in the mine (excluding the 200 level which has not been mapped or surveyed). It is believed that these features exercise the principle controls over the ore in the mine.

Base maps for the work were provided by the Company. They are the result of brunton-tape work by company engineers. They were found to be reasonably correct for this type of surveying but not actually satisfactory. Transit surveys have been made from point to point in the mine as needed since these maps were first produced and changes have been necessitated which have been sufficient to effect projection of some of the structural features. The original errors appear to have been in bearing, as might be expected in this environment. Additional changes can be expected to be made in the mine maps as surveying progresses.

AREAL GEOLOGY

The Mineral Hill Mining District in which the Mineral Hill Mine is located is a subdivision of the Pima Mining District which lies on the east slope of the Sierrita Mountains about 18 to 30 miles by road south of Tucson, Arizona.

Very little geologic work has been done here. Consequently a complete understanding of the various geologic features is yet to be attained. Faulting and igneous intrusion have contributed to the incomplete exposures of the sedimentary rocks in the area and extensive alluvial cover has obscured most of the structural relations and nature of the igneous masses.

In general, the Sierritas have a granitic core. On the west slope the sedimentary rocks have been regionally metamorphosed from conglomerates, sandstones, shales, limestones, tuffs and rhyolites to schistose equivalents. No fossils have been found and their age is unknown. On the east slope are sediments which are altered to a much lesser degree by contact metamorphism. Fossils indicate that they range in age from Cambrian to Cretaceous. (1)

In the Mineral Hill Mining District the following sequence of sedimentary rocks has been proposed. (2 and 4)

<u>Upper Cretaceous</u> (unknown thickness)

Arkose with shale and thin limestone
Recreation Red Beds
Undifferentiated volcanics and sedimentary beds

<u>Permian</u>

Snyder Hill Limestone	Thickness ?
Quartzite	"
Limestone	"
Quartzite	"
Limestone	"
Shale Limestone, marl, gypsum	A few hundred feet thick

Pennsylvanian

Naco Limestone	Thin bedded cherty limestone with many thin shaly portions interbedded with massive thick bedded limestone, fossiliferous. 750' thick at Mineral Hill and very important as host for ore.

Mississippian

Escabrosa Limestone	Pure limestone with cherty nodules. Fossiliferous. 350 feet thick at Mineral Hill.

Devonian

Martin Limestone	Fossiliferous. 100-350 feet thick at Mineral Hill.

Cambrian

Abrigo Limestone	Brown to light green silicified, and 350 feet thick at Mineral Hill.
Bolsa Quartzite	Brown weathering approximately 600 feet thick at Mineral Hill.

Coarse grained igneous rocks ranging from granite and quartz monzonite to granodiorite floors much of the pediment surface about the mine. Contact metamorphism along its contact in sedimentary rocks suggest that the igneous mass is intrusive. Some intrusive dikes which range from acid to basic composition cut the sediments and are believed related to the granitic intrusion. Some irregular andesitic bodies are younger than the Cretaceous sediments and are mineralized. Red basalt masses may be even later. (4)

There is evidence that the regional structure has been complicated by folding, overturning, and low angle thrusting but for the most part the pattern has not been worked out. Mayuga (2) interprets the attitude and relation of the sediments in the Mineral Hill area to be due to their position on the east limb of an overturned fold. The position of the west limb of the fold he believes is occupied by a body of granite. He also admits that the pattern may be caused by remnant of a thrust fault slice, but thinks this is rather a remote possibility. See figures 1 and 1A. Some geologists believe that the igneous mass has been emplaced along an ancient thrust fault and along which faulting has been resumed after intrusion. In contrast to Mayuga, Mershon and Short (3) believe that the relationship of the Permian Naco lying under the Escabrosa and Martin limestone north of the Mineral Hill mine is due to a 45 degree northeast dipping thrust fault.

The ore deposits of the area consist of three types: contact, replacement, and fissure veins. The principle mines are less than a mile from igneous contacts and the evidence suggests that northeast and east-trending fissures were the principle channels of the ore bearing solutions. An apparent zoning of the contact minerals is reported to be present. (4) The zone nearest the contact is characterized by garnet and other ferric iron compounds. The next zone outward is characterized

by ferrous iron compounds such as hedenbergite. Sulphides occur in the outer zone with little or no contact minerals.

Contact deposits are limestone replacements marked by the presence of contact silicates containing copper-silver mineralization. Very little lead or zinc is present, but some tungsten occurs as scheelite. Distribution of the minerals is erratic along fissures which trend northeast or east. (4)

The principle replacement deposits occur in limestone other than the pure Escabrosa. These deposits contain lead, zinc, silver, and copper along with the contact metamorphic silicates, quartz, pyrite, magnetite and hematite. (4)

Fissure veins occur in arkosic and volcanic rocks in steep dipping fractures which strike about north 8 west. They contain lead, zinc and silver but some have gold-pyrite and quartz-scheelite deposits. (4)

HISTORY OF THE MINERAL HILL PROPERTY

The original discovery and location of this property was made in 1882 by Thomas Hughes. He worked the deposit for copper, silver, and gold from the surface and by 1889 had succeeded in shipping 9000 tons of "high-grade" copper ore of unknown grade to the American Smelting and Refining Company's smelter at El Paso, Texas. In 1889 the Mineral Hill Mining Company was formed and operated the mine. From 1889

to 1894, 4000 tons of 12½% copper ore was shipped to El Paso, Texas. In 1894 this company consolidated with the Copper King Company and the latter became the operating concern. From 1895 to 1897 4,976,487 pounds of ore were shipped to the smelter at El Paso. This ranged from 10.7% to 22.0% copper and averaged about 11.0%.

In 1897 the consolidated companies were reorganized under the laws of the territory with two and a half million shares of stock at par value of one dollar. It became known as the Azurite Copper and Gold Company.

In 1898 they installed a smelter of their own which had the capacity of 84 tons per 24 hour shift. This was operated intermittently for two years at intervals of 7 to 8 months. During this period 9600 tons of ore were smelted which averaged 6% copper. This produced about 800,000 pounds of matte averaging 65 to 70% copper and 25 to 45 dollars gold. In 1899 they shipped 42,900 pounds of copper bullion and matte.

In 1904 the Azurite Company was succeeded by the Mineral Hill Consolidated Copper Company of Pittsburgh, Pennsylvania. They also owned the Azurite, Plumed Knight and Sunrise group of claims. This company operated the mine intermittently until 1918. The production records during this latter period

are incomplete. Mineral Resources and U. S. Geological Survey reports credit the Pima Mining District of Arizona with 6,683,094 pounds of copper which came mostly from the Azurite workings of the Mineral Hill Consolidated Copper Company. Elsing and Heineman (6) credit the Company with 8,000,000 pounds of copper and $50,000.00 in silver which total close to two million dollars between 1898 and 1918.

Little information is available for the period of 1918 to the present time. At some point the Barnes Mining Company, a subsidiary of the Barnes Oil Company of Texas, secured the Mineral Hill Mine. The Banner Mining Company of Nevada secured an option to buy the mine from the Barnes Company prior to 1950 and in 1950 requested a DMA loan from the Government to unwater, rehabilitate, and sample the mine. If the ore thought to be present according to records and reports was indicated, the Banner Hill Mining Company planned to exercise the option. The loan was granted and the contract executed to a successful conclusion and termination by 1953.

MINE GEOLOGY

Surface Geology

The surface geology is shown on figures 1 and 1A which have been taken from the work of Mr. B. W. Venable and Mr. M. N. Mayuga (2). This area has been mapped several

times by students from the University of Arizona and others, and the geology as portrayed on the above maps represents the general consensusof the various workers' opinions.

The geological picture essential to this report is as follows. A large normal fault, the Mineral Hill fault, is conspicuously exposed in the mine area and it strikes about north 65 west and dips about 45 degrees southwest. On the footwall side the formations strike steeply northwest and dip steeply south. According to the age and structural relationships, the formations are over-turned to the northeast. On the hangingwall side the formations strike parallel to the fault, dip steeply south, but are not over-turned. The amount of movement on this fault is not known. However Permian Naco limestone is brought down against Cambrian Bolsa quartzite and an extreme vertical range would be about 2400 feet. The throw is left and perhaps at least 1000 feet. The east-west striking south dipping Beta fault, is interpreted to sever the northeasterly trending south, east dipping Alpha fault. The indicated throw appears to be about two hundred feet and the vertical component is unknown.

A tongue of granite appears to be intrusive into the quartzite on the footwall of the Mineral Hill fault and another one in the Naco on the hangingwall side.

Accompanying the trend of the Mineral Hill fault is a zone of characteristic contact metamorphism of the limestone up to six hundred feet in width. This appears to be present in the Naco and Abrigo formations but not to a marked extent in the Bolsa quartzite. It is spatially related to the fault but not the intrusive granite.

Mineralization is confined largely to the zone of contact metamorphism in the limestones and is associated with the principle faults mentioned above. Mineralization indicated on figure 1, consists largely of secondary and oxidized copper minerals which are known to pass into sulphides at a relatively shallow depth. Most of these showings do not constitute ore and have been abandoned at an early stage of exploration years ago.

Underground Geology

Stratigraphy and rock types

The stratigraphy of the surface in the immediate area of the mine is the same as that mentioned previously (2) and illustrated in figures 1 and 1A. The surface geology and stratigraphy do not strictly apply underground because of low angle thrust faulting and because mine openings are almost wholly within the zone of contact metamorphism which renders identification of some formations difficult. The complexity of the geology in the mine is not reflected in the exposures on surface. Figures 1 through 13 including plans and sections

which accompany this report illustrate the geologic picture in the mine workings.

The only formations which can be correlated between the surface and the underground exposures are the Naco and the Bolsa.

Quartzite

A hard glassy grey to dark grey strongly shattered rock which does not contain obvious bedding planes is exposed on the northeast end of the 500 and 300 levels. On the 500 level it is in faulted contact with granite on its west side and extends uninterruptedly several hundred feet east to and beyond the number two shaft. It is in faulted contact with limestone on the 300 level (See figures 2 and 3). This is thought to be Bolsa quartzite.

On the 600 level east end, a poor exposure of mixed silicified limestone and thin beds of clear to light grey glassy quartz was noted. This may be an exposure of Abrigo formation, but its structural relation to the Naco limestone (tactite) is not clear.

Limestone

Although there is no limestone in the mine workings which fails to show some effects of contact and hydrothermal metamorphism, several areas of limey rock showing a minor degree

of alteration relative to the tactites and marbles, etc. have been classified as limestone. They vary in color and texture and probably range in age from Cambrian to Permian. No positive identification is possible at this time and no evidence of fossils has been found.

Such rock occurs on the 300 and 600 levels. They are generally fine-grained and range in color from white to light grey and light green. As far as can be determined, these may be either Abrigo or Martin (?). It is believed that the Naco is completely altered to tactite in the ore zone from the 200 level downward.

A dark grey to black medium to fine-grained limestone has been separately designated. It is present in small exposures on the south end of the 700 level and on the northwest end of the 600 level. The rock is virtually unaltered on the 700 level. On the 600 it has been a little more strongly sheared, partially bleached, and contains some coarse disseminated pyrite mineralization. Some chlorite is developed on the shear planes. This tends to lighten the rock color to a small extent. It is thought to be the Snyder Hill Limestone of Permian age.

A medium to fine-grained recrystallized limestone classed as marble is separately designated. This is a pure white rock and thought to be Escabrosa Limestone of Mississippian age.

Tactite

Two types of tactite are present in the mine. One type, distinctive in its appearance and distribution, is Naco Limestone of Permian age. The second type cannot be bracketed as being the equivalent of any particular formation. The metamorphosed equivalent of the Naco Limestone is a light buff, greenish or light brown, fine- to medium-grained granular rock containing light and dark brown garnet, green epidote and diopside, together with other finer-grained unidentified silicate minerals. The thin-bedded shaly portions of the formation are characterized by conspicuous thin banding which has been emphasized by replacement of the impure partings by sulphides, hematite, magnetite and chlorite. The massive unbanded tactite represents the massive limestone. It is generally much harder than the banded sections as well as finer-grained.

A fine- to medium-grained massive hard dense reddish-brown tactite is locally termed "jasperoid" or"garnetite". The fine-grained portions consist of unidentified skarn-type minerals but brown garnet up to $\frac{1}{4}$" is present in the more coarse-grained variety. In places the rock is silicified. It is characteristically mineralized by myriads of minute red hematite-bearing veinlets, but it also contains disseminated

granular hematite and magnetite. Considerable disseminations of chalcopyrite and small stringers,occur in it to constitute ore. The distribution of this rock type on the 300, 600 and 700 levels suggests that it may be either an alteration product of a certain portion of the Naco limestone or possibly another formation. However, the distribution of some scattered segments unrelated to the main mass, suggest the possibility that it is related to geologic features other than original sedimentary distribution.

Igneous rocks

A coarse-grained normal type granite is present throughout the mine and creates a footwall for many of the ore bodies. In the hand specimen it consists of quartz orthoclase and hornblende. All sedimentary-granite contacts show evidence of faulting and are usually accompanied by one to several feet of shearing most of which is localized on the sedimentary side. Chloritization of the contacts is usual and much of it occurs in the granite. Fault adjustment has taken place along the contacts and sharp intrusive contacts are very rare. Since this body is surrounded by the halo of contact metamorphism, it is probably intrusive to the adjacent sediments.

A dark green, fine-grained, dense crystalline rock which might be a basic intrusive is present on the 300, 500 and 600 levels. It appears to have an intrusive contact with

granite in the north crosscut west of the shaft on the 600 level. An especially heavily chloritized zone on the main crosscut of the 600 level has been too heavily sheared to determine if the zone is due to the presence of a basic dike or merely due to hydrothermal alteration in sheared granite. An exposure similar to the 600 level is noted in the north lateral east of the shaft on the 500 level where a sharp contact with this type of rock and granite is visible. A similar relationship is observable on the north side of the 300 level northwest of the main shaft. See figures 2, 3 and 4.

Folding

Surface exposures as noted before have been interpreted by Mayuga and Wilson and others (2) (4) to be due to extreme folding and consequential overturning to the northeast. This is one possible interpretation of the exposures on the footwall side of the Mineral Hill fault but it does not appear to apply to the hangingwall. Complex faulting as well as metamorphism has destroyed almost all bedding planes and formational identities are not yet able to be established with confidence. Evidence of regional folding, as noted on surface, is not apparent in the underground workings.

The Naco Limestone provides the only recognizable bedding. This is crumpled and folded. It is noted to lie at all attitudes from east-west to north-south and from nearly horizontal to vertical. Most of this disturbance appears to be very small-scale and related to the local faulting of small fault blocks rather than directly to regional folding stress.

Faulting

In contrast to the surface exposures, a complex set of faults occur in the underground. Correlation of these is difficult because there has been insufficient exploration between levels to aid in the development of the three dimensional picture of the structural relationships between the various levels. One of the principle factors complicating the projection of the various faults on dip is the presence of extremely flat south-dipping faults. Some of these can be observed on the levels, in the inclined shaft, the one accessible raise in the mine, and in old stopes. See plans and sections. The presence of such faults between levels can also be inferred because of numerous anomalous results obtained in projection of igneous contacts and faults from level to level. (See figures 6 through 12, vertical sections.) This is especially true for the area between the 300 and 500 levels. Faults also tend to change strike and dip and character of gouge when passing through the hard and soft formations in the mine.

This makes correlation uncertain in some instances.

Alpha-Beta faults

The surface fault pattern is simple. See figures 1 and 1A. The major Mineral Hill fault is normal and strikes north 60-65 west and dips 45-50 degrees south. It cuts off the east-west striking, south-dipping Beta fault and also the northeast-trending, southeast-dipping Alpha fault. The Beta fault offsets the Alpha, and the resulting throw is left about 250 feet. The actual amount of displacement on the Alpha and Beta faults is unknown. The Mineral Hill fault here brings Naco Limestone on the hangingwall down against Bolsa quartzite on the footwall. The magnitude of adjustment thus indicated could vary from 1000 feet to 2350 feet vertically as based upon local formational thicknesses. The apparent throw on the Naco formation appears to be about 3700 feet horizontally.

On the 300 level of the mine the Mineral Hill fault displays Bolsa quartzite on both the foot and hangingwall so that the indicated vertical movement is a matter of a few hundred feet at the most. This suggests that the fault plane has undergone a rotational motion rather than a simple normal displacement. If this is true, the overturned appearance of the footwall formations (see figure 1A) may

be due to clockwise rotation of the footwall of the fault relative to the hangingwall rather than to a regional overturning suggested by earlier workers. The Mineral Hill fault is not exposed on any of the other levels in the mine but apparently lies in the footwall of the mine workings a few hundred feet north of the shaft.

The tentative relations between the Alpha and Beta fault are shown on the various plan and vertical sections. A direct projection of these large faults throughout the mine cannot be made because they have been offset by both steep north-dipping faults and probably by undisclosed flat faults previously mentioned. See figures 7 and 9. Vertical exploration is needed to substantiate or disprove the present interpretations in this report. In spite of this later faulting, it is believed that the Alpha and Beta faults maintain the spatial relationship shown on the surface plan and can be individually identified on the 300, 500, 600 and 700 levels. In other words, post- alpha-beta fault displacement has not destroyed the basic pattern shown on surface.

At some point above the 300 level in the hangingwall of the Mineral Hill fault the Alpha and Beta faults encounter a granite mass which apparently does not crop out at surface.

The contact of this granite is utilized by the faults. On the 300 level the junction of the Beta fault with its hangingwall segment of the Alpha fault is disclosed meeting at the granite contact. Only the hangingwall segment of the Alpha fault is disclosed and according to the surface pattern the footwall segment must lie about 250 feet west of the 300 level workings. This is an important factor to consider later under possible exploration.

Below the 300 level the granite is present in two tongues. This pattern is believed to be due in part to original intrusion, but later faulting has complicated it. See figures 3 and 9. Below the 300 level the Alpha and Beta faults each follow the contacts of the two tongues of granite. The segment of the Alpha fault on the 500 level is the footwall segment but <u>it lies almost immediately below</u> the hangingwall segment shown on the 300 level. This indicates that the relative horizontal shift between the 300 and 500 levels is about 250' on the basis of the relative position of the Alpha fault segments. The 300 level horizon was apparently shifted northwest relative to the 500. This must have taken place along an undisclosed fault, presumably a post Alpha-Beta flat dipping structure probably similar to other flat faults abundant in the workings.

On the 500 level the hangingwall segment of the Alpha may be the flat northeast-trending fault passing through the 500 number 3 ore body (see figure 2).

On the 600 level the east-west Beta fault follows the granite contact and appears to sever the Alpha fault in the same pattern noted above. The footwall segment of the Alpha is present in the main crosscut from the shaft and here, instead of following the granite contact, it lies within the granite. The hangingwall segment of the Alpha may be as indicated on figure 3. Fault X may be an intersecting northerly fault or a result of the Alpha changing its strike. There is no indicated horizontal shift between the 500 and 600 levels as there is between the 300 and 500.

The 700 level exposures are too limited to show the Alpha-Beta fault relationships. The Beta fault may not be exposed. The Alpha Fault is thought to be the principle fault on the south side of the level.

North-south faults

A system of north-striking steep to vertical dipping faults and fractures are present in the 600 #1 ore body which are very similar in appearance to the Question Mark and X faults and with which they are probably associated in formation. They are commonly open fractures, vuggy and lined with calcite and quartz crystals which cover abundant fragments of brecciated wall rock partially filling the openings.

The fragments all contain chalcopyrite, so that post-mineral adjustment is thus indicated. Faults of this type are rare. They appear to have been terminated by low angle south dipping faults as indicated on figure 3.

The north-south Question Mark fault on the 600 west end has been interpreted by the operators to be the Alpha fault. However it is much too far west of the proper projection of the Alpha fault and it dips in the opposite direction. It appears to be a different fault belonging to north-south series. It brings what is thought to be Escabrosa limestone on its hangingwall against Naco on the footwall. This indicates that it is a reverse fault with a vertical component of only a few hundred feet. It consists of a wide zone of open vuggy fractures which are individually up to ten inches in width. It is the only single fault in the mine which makes about 100 gallons of water per minute. It is displaced on the north by a south dipping flat fault.

North dipping faults

A few north dipping faults occur on which the latest fault movement has taken place, according to present interpretations. The dips of these faults vary from steep to flat. They appear to strike northeasterly. They are best illustrated in vertical section figures 7 through 13. They

appear to be both reverse and normal types.

Flat south dipping faults

Numerous flat south dipping faults occur throughout the mine, most of which appear to strike northeasterly or east-west. They appear to be later than other faults except possibly the steeper north dipping faults previously mentioned. They are best seen on and about the 300 level where they conspicuously displace the thin-bedded horizons in the Naco limestone. Differences of strike and dip above and below some of the faults are as great as 90 degrees. A flat south-dipping fault is recently reported by the operator which he believes limits the south extremity of the 600 #1 ore body. A flat south-dipping fault definitely limits the 600 #2 and 3 ore bodies above the level, but that fault in turn is displaced by a north-dipping reverse fault. See figure 11.

Tactite breccia zone

An intensely brecciated and hydrothermally altered tactite zone occurs on the 600 level a short distance south of the granite contact on the hangingwall side of the Beta fault. It varies from 30 to 50 feet in width and traceable between crosscuts for at least 300 feet along its strike.

It appears to have been derived from the more massive member of the Naco limestone by extreme crushing and shear. It contains rounded fragments, the largest of which do not exceed 1/8", in a fine-grained matrix. Several steep faults cutting through it were noted to contain up to one inch of long asbestos fibers on them. The zone itself is barren of commercial quantities of any metallic mineral. However, on some slips within the zone, blebs and pods of molybdenite occur (up to 1/2 or 3/4" thick and a foot or two in length). It bounds the 600 #1 ore body on the north and the 600 #2 and 3 ore bodies on the south. It stands very well in the mine opening as long as it is dry but as soon as water reaches it, it turns quickly to a soft muddy running mixture. This has not been noted on other levels.

San Xavier thrust fault - regional thrust

The operator's report indicates his interpretation of the San Xavier thrust by a vertical section. The writer is not in agreement with this. In the crosscut south from the shaft on the 700 level the granite walls from top to bottom display very closely spaced flat dipping shear and fracture planes of the type associated found in the wall rack adjacent to faults. This phenomena is visible from the shaft south to the ore body.

At the point where the crosscut meets the ore body it first encounters a south-dipping flat fault (12 degrees) which separates the tactite from the granite footwall, and which is thought to "bottom" the ore. This, according to the operator, is the San Xavier thrust. This fault also occurs in the raise as shown on figures 6 and 7 at 29 feet above the level where it steepens to 45 degrees. The writer believes that this is merely a hangingwall segment of a far larger fault which lies undisclosed just below the 700 level and is evidenced by the intense shearing in the crosscut. It appears possible that the mine is in an over-thrust block and that the granite and all formations above the fault have been transported from an unknown direction and distance.

Relative ages of faulting

It is not possible to work out a satisfactory sequence of faulting in the mine on the basis of limited information. Many of the faults have undergone post-intrusive adjustment but many were probably pre-intrusive in origin. The Beta fault, which is known to be younger than the Alpha fault, in two places on the 600 level contains tongues of granite which appear to be intrusive to the fault and die out within it. No evidence is visible which indicates that these relations are due to faulting. Thus both the Alpha and Beta may be very early in origin. The Mineral Hill fault is post-igneous and pre-ore mineral in age.

It is believed that most of the faults in the mine

were pre-ore mineral in origin and that some of them have undergone a limited amount of post-mineral adjustment which cannot be demonstrated to be of appreciable magnitude. Steep dipping north-south striking breccia faults on the 600 level contain copper ore in the breccia fragments. These faults are terminated against later flat south dipping faults which also contain copper mineralization. North dipping faults are observed to offset the flat south dipping faults. It is believed that the flat dipping faults are related to the large regional San Xavier thrust fault which appears to underlie the 700 level. This large fault is post-igneous in age and by inference, because of the relations of the faults of similar attitude above it, probably pre-mineral also. Movement on this fault probably reactivated the earlier faults and further shuffled the faulted contact zone by creating some of the later faults. The latest movement is probably on the east-west and northeast trending north dipping faults.

Alteration (megascopic analysis)

Contact metamorphism

Alteration of the sedimentary rocks in the mine is widespread and, excluding the 700 level exposure of the Snyder Hill (?), none have escaped it. The principle alteration type

is contact metamorphic which resulted in tactite, described under rock types. In view of the proximity to granite contacts the rocks have not been metamorphosed to a high degree and massive coarse-grained tactites are lacking throughout the mine. In several places relatively unmetamorphosed limestone lies within 50 to 100 feet from the granite while tactite lies further beyond. In general the degree of metamorphism seems to be related to the granite contacts in the mine. This is not true at the surface exposures. In the mine, contact metamorphism in the Naco (the formation closest to the granite) starts about 100 feet below the collar of the inclined shaft and reaches a maximum around the 200 level. This degree of metamorphism is maintained below the 600 level. Above this point the limestone appears to be hydrothermally bleached rather than contact metamorphosed. This apparent limit of contact metamorphism is 150 feet above the nearest known granite.

Chloritization

A second type of alteration, chloritization, is widespread in the mine. It is later than the contact metamorphism on which it is superimposed. It is spatially related to granite contacts along which or near which it is most intense. Almost all the granite contacts are chloritized as well as the adjacent rocks. Fault planes and shear zones within the granite have been highly chloritized in places. However, some of these may be basic dikes. Exposures are not extensive enough to

disclose sufficient evidence for this. The most intensely chloritized zones in the tactites are in and along the thin-bedded portions of the Naco Limestone and extend farthest from the granite along these zones. This is probably a function of the permeability and the relative accessibility provided to the hydrothermal solutions by the rocks. Chlorite in massive tactite is always associated with a fault or faults.

Silicification

Silicification is present to a minor extent in the copper-bearing ore zones, but it is prominent in a rich silver-lead-tungsten-zinc zone of mineralization on the west end of the 600 level. See figure 3.

Hydrothermal alteration

Hydrothermal alteration of an uninvestigated nature has bleached and altered the limestones on the eastern extremity of the 300 and 600 levels. It is also evident that hydrothermal alteration has been superimposed on the contact metamorphism in the ore-bearing zones in the thin-bedded Naco. It has similarly affected the breccia zone on the 600 level. The effect has been to lighten the color and soften the rock, and it probably closely attended ore emplacement. Hydrothermal alteration is probably associated with the formation of small veinlets of red hematite which occur in the tactite (jasperoid)

of some of the ore shoots and is responsible for its red coloration.

Recrystallization of the limestones such as the Escabrosa is thought to be associated with contact type of metamorphism.

The age relationships of the alteration appear to be the same as would normally be expected. Contact metamorphism was followed by chloritization, which in turn was followed by hydrothermal "bleaching".

The Mineral Deposits

The deposit of principle economic interest is a series of low-grade, copper-bearing ore bodies. In addition, three zones exist which are at present only of mineralogical interest and which have not been investigated. These contain sphalerite-scheelite, molybdenite, and high silver bearing cosalite-scheelite respectively. They are small occurrences and in an entirely different environment than the copper bodies. Investigation of these might reveal that larger deposits of similar nature occur around the fringes of copper mineralized areas.

Copper ore bodies

Copper-bearing zones appear to be confined to contact metamorphosed sediments which constitute the Naco formation.

In general the bodies are grouped around the granite-sedimentary contacts and do not extend more than a few hundred feet from them. Emplacement of the ore is the result of hydrothermal processes which followed the faulting of the metamorphosed limestoned. Three types of ore bodies may be defined.

1. Ore bodies resulting from replacement of thin-bedded Naco limestone. The largest production of ore has come from this type of ore body, which contains the bulk of the ore reserves above the 500 level. Thin-bedded shaley zones in the Naco have been replaced along bedding slips by chalcopyrite, pyrite, hematite, magnetite and chlorite. The massive limestone between these thin-bedded members is also mineralized by a disseminated type of mineralization but constitutes lower grade ore. The massive type was sub-marginal for past operations and consequently constitutes the pillars in the old stoped areas. Some of these will be reclaimed by the present operators. Not all the thin-bedded zones in the Naco contain ore. Some are isolated from ore channels by faulting and some were too far from channels bringing ore solutions. The extent of the ore emplacement was apparently a function of permeability. This type of body becomes less common at depth as the more massive member becomes relatively more prominent. Ore bodies of this type are 300 #1, 500 # 2 and 4, 600 # 2 and 3.

2. Chloritic bodies

Some ore bodies are present in soft, strongly-sheared chloritized rock. This alteration preceeded the sulphide

mineralization and was superimposed upon the tactite and limestones. The most strongly chloritized bodies appear to have been thinly bedded members in the more competent massive formations and which were less resistent to crushing and shearing stresses. Not all chloritic bodies contain commercial ore but all show some degree of sulphide mineralization, except those in the granite which are barren. Ore bodies of this type are the 300 #1 and 500 #4.

3. Massive tactite bodies.

The 600 #1 and 700 #1 ore bodies are contained in a hard massive and somewhat shattered reddish brown tactite which is locally called garnetite or jasperoid. Traces of thin-bedded members of the Naco are not present.

Ore Controls

There is abundant evidence of geologic control of the ore bodies in the Mineral Hill Mine. Primary prequisites for the receptical of ore depositions appear to be as follows:

1, Sedimentary rocks, mainly limestones and limey argillaceous rocks, which have undergone contact metamorphism and been converted to tactite. No ore bodies occur, as far as now known, outside of tactite zones.

2. Tactite must have been prepared prior to ore deposition by strong shearing and fracturing to produce the necessary permeability. Massive unfractured tactite rarely contains ore except in the immediate vicinity of the permeable

thin-bedded zones. On the other hand extreme crushing and alteration is unfavorable. The large brecciated zone on the 600 level along the hangingwall of the Beta fault is not mineralized to an appreciable extent.

Structural controls which are observed to affect the localization of the ore are as follows:

1. Igneous contacts: all ore bodies are grouped around the known igneous contacts within the halo of contact metamorphism. Several ore bodies are bottomed by faulted zones along the granite contacts. Granite thus provides a footwall for a portion of the 300 #1, 500 #1, 500 #4 and 600 #2-3 ore bodies. A flat fault, which has been interpreted by Mr. Venable to be a normal intrusive contact, underlies and apparently limits the 700 #1 ore body. Granite has been an unfavorable host rock for ore although, in places, it contains a small amount of ore in a thin zone at the immediate contact with the tactites where it has been extremely sheared.

2. Faulting: this produced the desired permeability and the favorable zones by creating accessibility for the ore bearing solutions. At the surface mineralization was localized at the Alpha-Beta-Mineral Hill fault junctions. Below, the Mineral Hill apparently does not exert a direct influence upon the ore bodies which are rather remote from it. They occur along the Alpha and Beta faults at or near their junction with other faults.

Most of the faulting has been post-intrusive and contact metamorphic but pre-ore. This has resulted in considerable displacement and redistribution of the favorable beds. Consequently, the ore bodies are scattered and not continuous because of selective replacement of certain favorable fault blocks.

Some faults and breccia zones have acted as impervious barriers and have damned or directed the flow of ore bearing solutions. Flat faults have been especially influencial in this respect as shown by the results of stoping in the 600 #2 and 3 ore bodies.

Thin-bedded zones have been especially favorable and usually contain the highest grade ore. In some instances faulting has isolated blocks of these zones in such a way that they have not been reached by ore bearing solutions. In the present mine exposures post-mineral faulting cannot be demonstrated to have been extensive or to have dislocated any of the ore bodies.

Mineralogy

The ore minerals in the copper bearing ore bodies are chalcopyrite containing silver or associated with unknown silver bearing minerals, minor amounts of sphalerite, covellite, chalcocite, molybdenite and scheelite. Chalcocite is present only as a superficial coating, which is post-mine opening in age.

The gangue minerals are pyrite, hematite, magnetite, quartz, calcite, chlorite and tactite.

As noted on the plan map of the 600 level figure 4, there are several zones of mineralogical interest. On the extreme south side of the level a narrow rich vein 6-8" in width occurs in white marble. It contains sphalerite quartz and calcite with considerable amounts of scheelite. A sample of this vein, assayed at Jacobs Assay office in Tucson, contained the following:

.005 ozs. gold; 0.1 ozx. silver; 1.96% tungsten; 1.6% molybdenum; 0.1% lead and 30.0% zinc.

On the northwest end of the level a strongly silicified zone along a marble-tactite contact contained abundant cosalite (identified by Mr. Lamar Evans of the U. S. B. M. Metallurgical Division). One sample of this mineral contained up to 300 ounzes of silver in the pure specimen. A considerable amount of scheelite occurred with this. On the marble side of the contact several lenses of almost pure sphalerite were present. A cut sample of the cosalite zone over a width of 1.5 feet assayed at the U.S.B.M. Metallurgical Laboratory as follows:

8.5% Pb; 7.4% Bi; No Sb; 2.55% Zn; 0.35% WO_3; 60.1 ozs Ag.;

A sample of the sorted material assayed as follows:

42.% Pb; 45% Bi; 16% S; 8% Zn and .6% Ag.

The Beta fault zone on the north side of the level contained good molybdenite mineralization which is entirely in granite. A picked sample representing six inches of the better mineralized section assayed as follows:

0.02% copper - 2.25% MO

The lead-zinc-scheelite zones should be investigated since they occur in what has been considered an unfavorable rock type. They might lead to larger occurrences and have some economic importance.

Paragenesis from field relationships

The following paragenetic relationships are suggested from the manner in which the minerals were noted to occur in the mine. The order is that of deposition.

1. Tactite, probably with quartz and carbonates
2. Chlorite
3. Magnetite-hematite
4. Pyrite
5. Molybdenite-scheelite (order not certain)
6. Sphalerite
7. Primary copper minerals
8. Cosalite
9. Calcite quartz in post-ore faults
10. Malachite and secondary minerals
11. Post-mine oxidation, chalcocite-gypsum-copper sulfates, etc.

Secondary enrichment or impoverishment

There has been no secondary enrichment or impoverishment in the presently active mine levels below the 300 level, which is anything more than a superficial post-mine phenomena.

Casual observation of the 200 level and the shaft above indicated that secondary enrichment or leaching was never very important in the mine. It appears that the copper in the small areas which have been leached, did not move very far. Water from above had to perculate through some thick-bedded limestones and was probably charged with carbonate water and migrating copper was quickly fixed as malachite. There is no evidence of abundant chalcocite on the 200 level or below.

ORE RESERVES

The ore reserves and the calculations by which they were obtained are shown on the section figure 13 and need little explanation of the manner of calculation. The Banner Mining Company arrived at their estimates by averaging the tonnages which were measured on each level and multiplying the result by the vertical distance between levels. This procedure tacitly assumes that the ore will be continuous between levels.

Geological and structural conditions indicate that in most instances the ore will not be continuous between levels. Actually, it occurs in rather isolated bodies. The writer has estimated the ore reserves in a different manner than the Banner Mining Company and has arrived at a somewhat different result. The areas of the ore bodies as defined by the sampling of the Banner Hill Mining Company have been used as the basis for determining the tonnages for each level. These tonnages

were projected above and below the level for distances which seemed reasonable on the basis of available geologic information. In comparison with the figures of the operator, this resulted in lower tonnages of indicated and larger tonnages of inferred ore between the 300-500 and 600 levels. There is enough evidence to indicate that the ore will be continuous between the 600 level and 700 level on the number one ore bodies only. The calculations based on this resulted in lower tonnages of indicated ore than estimated by the operator.

A considerable discrepancy occurs between the writer's estimated tonnages above the 300 level and those of the operators. The bedded rich ore zones on the east half of the 300 level have been largely mined out. Left are pillars and the lower grade ore mostly in the form of massive tactite. The operator has estimated that he can profitably mine the whole area of the 300 level which includes the richer thin-bedded zones and as well as the massive tactite around them (see 300 level plan for relationship of massive and thin-bedded tactite). He fails to carry indicated ore above the 300 level but he does claim some 8600 tons of measured ore between the 300 and 200 levels. It is reasoned that if the undeveloped tactite on the west end of the 300 level can be mined profitably, the rock of somewhat lower grade over the east end can be mined profitably because it is already developed for mining

around the old stopes. It is therefore believed that a considerable tonnage of indicated ore is present here.

The writer's estimate is arrived at by taking the total volume of the zone and subtracting the tonnages of past production and that of the measured ore estimated by Mr. Farnham of the U. S. Bureau of Mines. The grade indicated by the operator has been used.

There has been so little actual exploration accomplished in the mine that it is very difficult and probably impossible to establish a true and accurate picture of the ore reserves at this time. The estimates which have been made are not considered to be of great significance as far as indicating what the ultimate production will be. The picture which has been developed shows that the operator will have to modify his previous conception of the mining methods to be used, as he planned to handle large tonnages of continuous ore shoots; he will have to develope instead a cheap fast method of mining small discontinuous ore bodies separated by faults and barren ground. He will also have to contemplate development and exploration work which he did not consider necessary. This will be essential to explore and mine several isolated ore blocks which do not come to the level below. He will have to test the barren an

questionable blocks between levels by drilling or raising and this will entail drifting and crosscutting to provide raise and drill sites.

He has two alternative programs. He can try for mining large tonnages cheaply and sacrifice grade; or he can try to maintain higher grade and mine the small ore shoots by more expensive methods. In any event, it appears that the tonnage of ore below the 300 level will be considerably less than hoped for. On the other hand, the apparently barren and questionable areas may prove to be better than it is expected. There is an equal chance at the best either way.

EXPLORATION POSSIBILITIES

Exploration is warranted in many places in the mine. The operator should test the areas above and below the known ore shoots for continuity and grade as well as the several barren and questionable areas between levels which were discussed under ore reserves. These are best seen in the vertical sections which accompany this report, figures 6 through 12. This would entail crosscutting, drifting, raising and diamond drilling.

According to surface indications, ore exists in the footwall of the Beta fault associated with the north segment of the Alpha fault which it has displaced. The area comparable to this on the 200 and 300 levels lies west of the present mine openings

about 250 feet. Crosscuts from these levels into that area appears a reasonable procedure.

All copper ore bodies occur in tactite and probably no tactite zone should be left unexplored. The 200, 300, and 500 levels are bounded on almost all sides by tactite except where granite is present on the north sides. Diamond drilling and crosscutting would be in order to explore these areas. The 600 level is largely bounded by limestones or marble which appear to be unfavorable for the occurrence of copper ore in the area. However, certain zinc-lead-tungsten bearing occurrences in the marble and adjacent tactite appear worthy of at least a limited amount of investigation to determine their potential.

The 700 level is one of the most puzzling problems for exploration in the mine. The ore body is surrounded by limestones and cut off by faults below and on its sides. It is believed that the best chance of finding ore will be by drifting along granite sedimentary contacts. It may be possible to find other tactite zones which are not indicated clearly at present time.

Further Government participation in the project is not warranted because the company is now in good financial position and can adequately bear the expenses of future operation.

SUMMARY AND CONCLUSIONS

1. The mining areas east of the Sierrita Mountains have had very little geological investigation in the past. Recent discoveries at the Mineral Hill Area and elsewhere indicate that important undiscovered ore deposits probably occur in the Pima mining district.

It is felt that this area should be given priority for a project or projects by the U. S. Geological Survey and the Bureau of Mines whereby detailed studies of the ore deposits can be made.

2. The DMA project at the Mineral Hill Mine of the Banner Mining Company must be classified as successful and a certification of discovery is warranted. No further Government participation is warranted.

3. The operating company has probably under rated the importance of geologic controls for its ore bodies, particularly fault structure. It has therefore possibly failed to obtain a correct picture of the distribution of the ore bodies in the mine.

4. Since mining methods and estimated costs have been geared to a picture of mining large tonnages from continuous ore bodies between levels instead of small disconnected bodies, the economic margin of profit will likely be far smaller than anticipated.

5. The over-all success of the Company's ventures in the area seems assured mainly because reliable indications of the existence of several new ore bodies have been found by the company near the Mineral Hill Mine by geophysical and diamond drilling methods.

6. The writer estimates that there are 380,601 tons of indicated ore averaging 2.8% copper in eight separate ore blocks. There is also about 66,660 tons of inferred ore in 4 of these blocks. Mr. Farnham of the U. S. Bureau of Mines estimates there are 4000 tons of measured ore averaging 3.23% above the 3rd level.

7. The primary ore controls appear to be rock type, igneous contacts, and pre-mineral faulting. All ore bodies occur

about and near the granite contact and wholly within tactite derived from the Naco Limestone and thin-bedded argillaceous limestone. Extensive shuffling of favorable blocks of ground by pre-mineral faulting appears to account for the unexpected distribution and relation of the various ore bodies.

9. The actual mutual relationships of the several sets of faults cannot be worked out satisfactorily on the basis of present information. However, the dominant and major fault structure appears to be a flat-lying fault beneath the 700 level. It is believed to be a regional thrust fault and has been named the San Xavier thrust. It is later than the granite and by inference it is thought to be pre-mineral.

10. The ore bodies contain chalcopyrite, sphalerite, molybdenite, scheelite and silver but copper is the economically important metalic element contained therein. There is some occurrence of argentiferous cosalite, sphalerite-scheelite on the fringes of the copper-bearing bodies which might be significant enough to investigate.

11. A considerable amount of additional exploration is warranted within the perimeter of the mine workings on all of the levels. Much, also, should be directed to unknown areas around the ore bodies and between levels. Likewise, a large potential ore-bearing area lies just outside of the limits of the mine workings which also must be investigated.

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Mining Division
Date Rec'd
OCT 5 - 1953

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES
MINING DIVISION
REGION IV

BUREAU OF MINES
Denver, Colorado
TUCSON, ARIZONA

SOUTHWEST EXPERIMENT STATION
Box 4097
UNIVERSITY STATION

OCT - 8 1953

September 24, 1953

Memorandum

To : W. H. King, Chief, Mining Division, Region IV

From : Chief, Mining Methods Br., Mining Div., Region IV

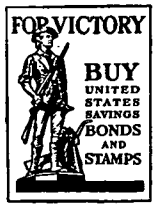
Subject : Final engineering report, Contract I-DMA-E32, Docket DMEA-269XA, Banner Mining Co.'s Mineral Hill Copper Mine, Pima Mining District, Pima County, Ariz.

Enclosed are original and 8 copies of the final engineering report on the above property by L. L. Farnham and T. M. Romslo of the Bureau of Mines. Romslo began this report during the 1952 fiscal year but was detailed to other work on July 1, 1953, so the report was completed by Farnham.

Walter R. Storms

Walter R. Storms

CC W. H. King (8)
DMA-269XA
DF



Reviewed by
DMEA OPERATING COMMITTEE
10-14-53
(date)

Defense Minerals Administration
RECEIVED
OCT - 6 1953

UNITED STATES
DEPARTMENT OF THE INTERIOR
DOUGLAS McKAY, SECRETARY

DEFENSE MINERALS EXPLORATION ADMINISTRATION

REPORT OF EXAMINATION BY FIELD TEAM
REGION IV

DMA-269X-A, Contract I-DMA-E32

Banner Mining Co.'s Mineral Hill Copper Mine

Pima Mining District

Pima County, Arizona

L. L. Farnham and T. M. Romslo
Mining Engineers
U. S. Bureau of Mines

September 1953

Reviewed by
DMEA OPERATING COMMITTEE
10-14-53
(date)

Defense Minerals Administration
RECEIVED
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DMA-269X-A, CONTRACT I-DMA-E32
BANNER MINING CO.'S MINERAL HILL COPPER MINE
PIMA MINING DISTRICT
PIMA COUNTY, ARIZONA

CONTENTS

Engineering report — Page

Summary, conclusions and recommendations -------- 1
Introduction ---------- 4
Acknowledgments ---------- 6
Location, topography, and physical features ------ 6
History and production ---------- 8
Ownership and extent ---------- 8
Geology and ore reserves ---------- 9
Description of the project work ---------- 12
Efficiency of operations ---------- 15
Expenditures ---------- 16
Equipment purchased for project ---------- 16
Projection plan ---------- 18
Additional exploration ---------- 20
Conclusions ---------- 21
Appendix ---------- 22

ILLUSTRATIONS

Figure — Following Page

1 Location map ---------- 6
2 Surface map ---------- 8
3 300 level ---------- 8
4 500 level ---------- 8
5 600 level ---------- 8
6 700 level ---------- 8
7 Vertical cross sections ---------- 10
8-12 (See geologic report)
13 Longitudinal section showing ore reserves ---------- 11

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

The Mineral Hill copper mine, Pima County, Ariz., was reopened in 1951-1952 by the Banner Mining Co. with Governmental aid as authorized under the Defense Production Act of 1950. The company applied to the Defense Minerals Exploration Administration for assistance in reopening the mine in order to verify reported reserves of 200,000 tons of 3.36 percent copper. Following investigations of the application, designated as docket DMA-269X-A, the project was authorized by Exploration Project Contract I-DMA-E32. The contract provided for expenditures not to exceed $126,786, of which the Government would participate to the extent of 50 percent of the incurred costs. The actual cost of the project, after the liquidation of the jointly owned property, was $102,255.64, of which $51,127.82 was paid by the Government.

The Mineral Hill property has been operated intermittently since the late 1880's. Recorded production, made largely during World War I, amounted to 46,631 tons of ore averaging 3.8 percent copper. Activity ceased in 1921 and the mine remained dormant until the initiation of the present operations in August 1951.

The project work, consisting essentially of rehabilitation, mapping, and sampling of some 4,300 feet of mine working, proceeded continuously and effectively until mid-December 1952 when the funds

authorized by the contract were exhausted. As the results of the exploratory work were successful in disclosing a substantial tonnage of ore, the company has continued the development work on its own account.

Certification of a discovery was made by the Defense Minerals Exploration Administration in May 1953. A production contract and a loan were secured from the Defense Materials Procurement Agency, which provides a guaranteed price of 31 cents a pound for the copper over a period of 3 years, or until 12,960,000 pounds have been produced. The company recently started the construction of a 300-ton flotation mill on the property. Production is expected to start early in 1954.

The Mineral Hill copper deposits occur in a zone of contact metamorphism as various sized irregular replacements in altered limestone. Exploration has exposed 8 separate mineralized areas distributed sporadically within a zone which has been explored for 500 feet along the strike and to an inclined depth of 800 feet. The ore bodies range from 2 to 30 feet in thickness, and have moderately flat dips. There are no raises in the principal mineralized areas so the vertical continuity and correlation of the ore bodies from level to level has not been demonstrated, nor have the irregular margins of the mineralization been fully outlined on the levels. Consequently, tonnage estimates at this time are necessarily based largely on arbitrary assumptions which, no doubt, would differ with different appraisers.

The ore reserves as estimated by the operator amount to 529,400 tons, comprising 84,400 tons of measured ore, 364,100 tons of

indicated, and 80,900 tons of inferred ore. The average grade of the reserves as calculated from some 500 of the operator's samples was 0.78 ounces silver per ton, 2.61 percent copper, 0.05 percent WO_3, and 0.05 percent MoS_2.

The ore reserves as estimated by the representatives of the Defense Minerals Exploration Administration amount to 451,261 tons, comprising 4,000 tons of measured ore, 380,601 tons of indicated, and 66,660 tons of inferred ore having an average content, before dilution, of 2.80 percent copper, 0.78 ounces of silver per ton, and 0.05 percent tungsten trioxide. Dilution presumably will decrease the grade about 10 percent, so as mined the ore will probably average about 0.7 ounces of silver per ton, 2.5 percent copper, and 0.05 percent tungsten trioxide.

The ore will be mined by modifications of inclined room-and-pillar, and shrinkage methods. Roof bolting has been tried experimentally with satisfactory results. Portable slusher hoists with scrapers will be used in the stopes to pull the broken ore down the flatly-inclined footwall to the haulage levels.

Ore dressing tests have shown that about 65 percent of the silver and 95 percent of the copper are recoverable in a flotation concentrate, and that from 50 to 60 percent of the scheelite can be recovered by tabling.

On the basis of these tests, that portion of the reserves covered by the Defense Materials Procurement Agency purchase contract will have an average net smelter value of $13.16 a ton. Operating costs

including royalty, were estimated to total $12.17 a ton, thus indicating an operating profit of about $1.00 a ton before interest, income taxes, depreciation, and depletion.

It appears probable that the Defense Minerals Exploration Administration loan of $51,127 can be repaid within the first year of full production. When that debt is retired, the indicated operating profit will be increased to $1.65 a ton.

The exploration project was conducted in an efficient and satisfactory manner by a competent company staff. The Banner Mining Co. is now in a position to continue the further exploration and development of the property without outside aid. The Governmental assistance rendered this company was instrumental in transforming a hitherto dormant mineral deposit into a productive enterprise which in all probability will produce significant amounts of needed metals.

INTRODUCTION

This report describes the results of a completed exploratory project authorized by the Defense Minerals Exploration Administration under the Defense Production Act of 1950.

On December 12, 1950, the Banner Mining Company applied for Governmental assistance in the reopening and exploration of (1) The Mineral Hill and Plumed Knight Mines, and (2) The Copper Glance, Copper Queen and Copper King group of mines at nearby Twin Buttes. The Copper Commodity Committee of the Defense Minerals Administration investigated

the application and decided, with the consent of the applicant, to consider it as 2 exploratory projects. The proposed projects were designated as the Mineral Hill Copper Mine, and the Twin Buttes Copper Mines, and were given docket numbers DMA-269XA, and DMA-269X-B, respectively.

The 2 properties were examined on April 16, 1951 by Grant R. Rubly, U. S. Bureau of Mines, and Nels P. Peterson, U. S. Geological Survey. The examinations resulted in favorable recommendations and the awarding of a contract for explorations at each project.

The Mineral Hill project was authorized by Exploration Project Contract I-DMA-E32 of June 29, 1951. The contract provided for explorations costing an estimated $126,786.00, and for Governmental participation of 50 percent of incurred costs. It specified that the 3 lower levels of the mine should be made accessible for an examination to verify reported reserves of 200,000 tons of ore containing 3.36 percent copper. It also provided for diamond drilling, drifting, and crosscutting in event an authorized geologic study of the workings indicated that such explorations were advisable.

The project was started on August 7, 1951 and was completed during December 1952. Monthly inspections of the project were made by an engineer of the Bureau of Mines for the Defense Minerals Administration and later the Defense Minerals Exploration Administration. This engineer submitted Progress Reports to the Field Team of Region IV, Denver, Colo. The Operator also submitted monthly reports consisting of a narration of accomplishments and findings, and cost reports. Charges of the cost reports were reviewed by the

inspecting engineer and personnel of the Denver office before the Operator received monthly checks covering the Government's share of approved costs. The monthly inspection of charges was supplemented by 2 on-site audits of cost accounts, one of which was made shortly after completion of the project. Reimbursement of the Government's share of costs for the last month of operation was withheld until the operator had: (1) Paid the Government for its equity in Physical Improvement, Equipment, Supplies, Materials, and Accessories; and (2) submitted a final geologic and engineering report, including an estimate of ore reserves. These provisions were complied with and all matters were eventually settled to the satisfaction of both the operator and the Defense Minerals Exploration Administration.

ACKNOWLEDGMENTS

Acknowledgment is due the following members of Banner Mining Co.'s field-staff for their cooperation with representatives of the Defense Minerals Exploration Administration: A. B. Bowman, Superintendent, E. E. Bray, Mine Foreman, B. W. Venable, Geologist, and E. C. Bowman, Clerk.

Acknowledgment also is due E. S. Bowman and W. H. Hardy, President, and Secretary, respectively, for their cooperation during the 2 periods when project records were audited.

LOCATION, TOPOGRAPHY AND PHYSICAL FEATURES

The Mineral Hill mine is situated in Sec. 2, T. 17 S., R. 12 E., and Sec. 35, T. 16 S., R. 12 E., Pima Mining District, Pima County, Ariz. It is about 20 miles south of Tucson, Ariz. (figure 1). It

may be reached from Tucson by driving west from U. S. Highway 89 on State Highway 86 to the Mission-Twin Buttes road, thence southerly 16 miles on the Mission-Twin Buttes road, and thence easterly about 0.1 mile on the mine road. All but the last 2 miles of this route is paved. The mine also may be reached by taking U. S. Highway 89 to the village of Sahuarita, a distance of 13 miles from Tucson, thence 7 miles westerly to the Twin Buttes road, and thence 4 miles north to the mine road. Sahuarita, the nearest railroad shipping point, is served by the Tucson-Nogales branch of the Southern Pacific Railroad. Sahuarita also is the site of Eagle-Picher Mining Co.'s concentrator for its San Xavier mine, the mine being one mile south of the Mineral Hill mine.

The Mineral Hill mine is on the northwest piedmont of the Sierrita Mountains at an altitude of 3,650 feet. The main shaft and surface structures are at the south foot of Mineral Hill. The hill, about 200 feet in height, is one of several in an area of a gently rolling surface that drains eastward to the Santa Cruz valley.

Vegetation is scant, consisting of forage grasses and a light growth of cacti.

The average annual precipitation is about 11 inches. Thunder showers during July and August may be heavy but should not seriously hamper mining operations. Temperatures range from about 20° F. to 110° F. above zero.

HISTORY AND PRODUCTION

Claims of the Mineral Hill property were located in the late 1880's, but little or no ore was produced from the property until World War I. From 1915 to 1917, 46,631 tons of ore, containing 3.8 percent copper and 0.77 ounce of silver a ton, was shipped to the smelter of the American Smelting and Refining Co., El Paso, Texas. From 1917 to 1921, the Barnsdall MiningCo. developed the lower levels. The mine was closed in 1921 and remained inactive until the present operations were initiated in August 1951.

OWNERSHIP AND EXTENT

The Banner Mining Co., a Nevada corporation, holds the Mineral Hill group of 38 patented mining claims under a lease and option agreement from the Barnsdall Mining Co. In the Twin Buttes area, the company has acquired major claims under similar agreements and holds other claims by locations. The company operates a mine near Lordsburg, N. Mex., and to date has maintained its main office in Oklahoma City, Okla.

The agreement covering the sale of the Mineral Hill group of claims was made during 1951. It calls for a purchase price of $160,000.00 to be paid at the rate of $300.00 monthly for the first 2 years and thereafter at minimum yearly payments of $10,000.00.

Property involved in the exploratory program at Mineral Hill comprises a group of 3 claims that are described in Mineral Survey 1649 as the Banes, the Copper Hill, and the Milton (figure 2).

GEOLOGY AND ORE RESERVES

Sedimentary and igneous rocks crop out in the vicinity of the Mineral Hill mine. The sedimentary rocks, consisting mainly of limestone, shales, and quartzite, range in age from Cambrian to Cretaceous. They have been intruded by granite that floors much of the area, and by porphyry dikes believed to be related to the granitic intrusion. Other igneous rocks consist of a few small masses of andesite and basalt.

At the Mineral Hill mine, the sedimentaries dip steeply to the southwest. The exposed ore bodies occur principally in Naco limestone and shales as replacements of the contact metamorphic type. They occur in the hanging wall of the Mineral Hill fault, one of four prominent exposed faults. The Mineral Hill fault can be traced on the surface for about 750 feet. It strikes northwest, dips approximately 45 degrees to the southwest, and joins the east-west striking Beta fault on the west. The 2 faults have dropped Naco limestone and shale beds down alongside Bolsa quartzite. The Beta fault forms the footwall of some of the exposed ore and appears to offset the Alpha fault to the west. The Alpha fault strikes northeasterly and dips steeply to the southwest. Its fault zone, about 200 feet wide, cuts through the west side of the mine and appears to form the westerly boundary of commercial ore. The San Xavier fault forms the contact between the sediments and underlying granite and cuts off the Mineral Hill fault between the 600 and 700 levels. It strikes north and dips about 10 degrees to the east.

The ore is present in fissures, sheared zones, and as disseminations in areas of metamorphism. It occurs mainly as chalcopyrite. Minor amounts of chalcocite, scheelite, and molybdenite also are present. The gangue consists of much pyrite and a host of contact silicate minerals.

The ore bodies are distributed sporadically in the zone of metamorphism, which has been explored more or less for 500 feet along the strike and to an inclined depth of 800 feet. The present drifts and crosscuts on the 4 lower levels have disclosed 8 separate mineralized areas which range in plan from those covering 150 square feet, to the largest which appears to cover some 2,000 square feet. As the ore replaces the altered limestones, it is generally parallel to the bedding. The beds, though locally distorted, dip southward and terminate downward against either the more flatly-dipping Beta fault or the granite (figure 7).

There are no raises in the principal mineralized areas so the vertical continuity and correlation of the individual ore bodies from level to level have not been determined, nor have the irregular margins of the major mineralized areas been fully outlined on the levels. Along the dip the ore has been found in places to end abruptly against flat faults. Consequently any estimate of ore reserves at this time must be based largely on arbitrary assumptions.

The ore reserves as estimated by Defense Minerals Exploration Administration examiners are almost entirely the work of R. E. Robinson of the Geological Survey who mapped the geology of the mine in considerable detail. A tabulated summary of these estimates is given below:

TABLE 1. - Ore Reserves.

Ore body	Tons measured	Tons indicated	Tons inferred	Total tons	Percent copper
300 - No. 1	4,000	173,760	45,480	223,240	3.23
500 - No. 1	None	17,622	11,748	29,370	2.01
500 - No. 2	None	10,164	5,544	15,708	2.57
500 - No. 3	None	12,662	None	12,662	3.50
500 - No. 4	None	7,776	3,888	11,664	2.46
600 - No. 1 & 700 - No. 1	None	154,585	None	154,585	2.29
600 _ No.2 & 3	None	4,032	None	4,032	4.64
Totals	4,000	380,601	66,660	451,261	2.80

The copper content of the reserves was calculated from 514 samples taken by the operator as shown on the level maps. Composite samples were assayed for silver, tungsten, and molybdenum.

The amount of ore that it will be necessary to leave as pillar supports during mining is expected to be largely offset by dilution. As the walls of the ore bodies in most cases contain appreciable mineralization it appears that the grade dilution will probably not amount to more than 10 percent. Thus the estimated minable reserves are of the order of 451,000 tons with an average content of 0.07 ounces of silver per ton, 2.5 percent copper, 0.05 percent tungsten trioxide, and 0.05 percent molybdenite.

The detailed calculations of the ore reserves are shown on figure 13 and a more comprehensive discussion of the reasoning employed in the estimates will be found in the geological report. The ore reserve estimate prepared by the operator is attached in the Appendix of this report.

DESCRIPTION OF THE PROJECT WORK

Work authorized by the contract was started on August 7, 1951 and was completed during December 1952 when allowable funds were exhausted. Existing facilities at the mine were confined to a galvanized-iron, wood-framed warehouse that had been completed shortly before the project started. During the life of the project, the operator did much work and installed various company-owned equipment at no cost to the Government. The following covers these principal items of work and equipment in which the Government did not share the expense:

1. Installation of an additional 50 H.P. pump at the 385-foot level with electric switches and armored conductor cable from the surface to the pumps;

2. On the 300 level, 870 feet of accessible drifts and cross-cuts were surveyed and 221 samples were cut; assays of these samples included 221 for copper, 167 for silver, 11 composite samples for MoS_2, and 5 composite samples for WO_3;

3. Several short diamond drill holes were drilled to delimit ore bodies;

4. Metallurgical samples were cut and sent to Salt Lake City for testing by Galigher Company;

5. Installation of a 686 cfm compressor.

Project Work

Surface

1. In the existing warehouse, partitions were erected for an office, and bins were built and installed to facilitate storage and handling of supplies;

The water then was lowered to immediately below the 700 level where station pumps were installed for pumping from the shaft sump to the upper sump. Approximately 300 gallons of water per minute was handled during these operations. Since the accumulated water was removed, estimates indicate an average inflow at about 150 gallons per minute.

2. Drifts, crosscuts and raises. A total of 3,485 feet of workings was rehabilitated. Of this footage, 994.5 feet was on the 500 level, 2,280 feet was on the 600 level, and 208.5 feet was on the 700 level. This work included clean-up of debris, laying of track, installation of air and water pipe lines, and the repairing of timbers or installation of new timbers where necessary. Debris encountered was mucked into cars, mainly by hand, that were hand-trammed to the shaft. The material then was hoisted to the surface in a skip. Mucking was done with a power shovel where feasible. Spiling was necessary at 2 places on the 500 level and at 3 locations on the 600 level. In general, the condition of the ground was found to be good on the 500 and 700 levels. On the 600 level, extensive timbering was necessary and much difficulty was encountered in reopening a raise that was filled with mud in a highly fractured rock.

Surveys

Maps were prepared for the 300, 500, 600, and 700 levels from a Brunton and tape survey. All of this work on the 300 level and most of the work on the 700 level was completed after termination of the contract at no expense to the Government.

2. Upon completion of a power line to the mine and a substation by the Trico Electric Co-Operative, the operator installed power lines and electrical apparatus from the substation to the motors of surface equipment;

3. A 40- by 40-foot galvanized-iron-sheeted steel-frame shop and change-room building was erected;

4. A 45-foot timber headframe was erected at the inclined shaft, and a 75-H.P. hoist was installed in a hoist house that was built near the headframe. The hoist house was a 20- by 25-foot wood-frame galvanized-iron clad structure.

Underground

1. Shaft. The inclined shaft was unwatered and rehabilitated from the surface to a depth of 830 feet. Track was installed for a skip that was used to remove considerable debris encountered in the shaft and other mine workings. The upper 325 feet of this 1½-compartment shaft was retimbered and other sections of the shaft were supported by installing new timbers or repairing existing timbers. Ladders, power and signal cables, and air and water pipe lines were installed for the entire depth. Mine water, encountered at an inclined depth of about 200 feet, was removed with sinking and station pumps. A sinking pump removed water to the surface until 2 50-H.P. station pumps were installed and placed in operation at a sump that was excavated on the 385 level. The sump, cut into the hanging wall, was completely coated with cement and walled off with a dam 6.5 feet high.

Sampling

A total of 293 channel samples was taken on the 500, 600, and 700 levels. The samples were analysed by Jacobs Assay Office, Tucson, Ariz. Determinations made were: Copper, 293; silver, 105; WO_3, 14; MoS_2, 23; and zinc, 13. Grab samples also were taken in mineralized areas while the workings were being reopened. The locations and assays of channel, bulk, and drill hole samples are shown on the attached level maps.

Sampling procedure appears to have been good with special attention given to zones where mineralization occurred in bands. In those zones, the channel samples were taken normal to the planes of mineralization.

EFFICIENCY OF OPERATIONS

All phases of the project were conducted in an efficient manner. Allan B. Bowman, a mining engineer with considerable operating experience, supervised the operations. He was assisted by E. E. Bray, a capable mine foreman, and B. W. Venable, geologist. The competency of Venable was demonstrated by the able manner in which he carried out geologic mapping, sampling, diamond drilling operations, and his commendable geologic report. E. C. Bowman, clerk and warehouseman, also carried out his duties in a manner that appeared to be above average.

Much of the equipment and supplies was obtained at considerable savings to both the operator and Government. This was made possible by building some items at the company's shop in Lordsburg, N. Mex. and by purchasing new or slightly used items from non-operating mines and used-equipment dealers.

EXPENDITURES

The total cost of the project, as allowed by an Audit Report of May 5, 1953, was $102,255.64. It reflects the adjustments for property liquidations shown in the following section of this report, "Equipment purchased for project".

A break-down of the total costs follows:

Labor and Supervision:	
Labor	$58,024.75
Supervision	9,505.39
Operating Mat'ls. and Supplies:	
Timber	4,975.69
Explosives	89.65
Pipe	2,805.67
Track	2,523.79
Other supplies	3,865.97
Power	6,615.42
Operating Equipment:	
Depreciation	2,162.29
Miscellaneous:	
Repairs to Equipment	1,493.19
Sampling and Analysis	681.00
Payroll taxes	2,225.01
Liability Insurance	6,525.22
Contingencies:	
Accountant's salary	762.60
Totals	$102,255.64

EQUIPMENT PURCHASED FOR PROJECT

The Government's interest in equipment, materials, and supplies purchased, and the installation cost of physical improvements was determined during a final inspection of the project. Costs of these items were obtained from monthly inventories by the inspecting engineer and from company accounts. Materials and supplies were

considered in categories. Where the cost of the remaining unexpended portion of any such category of supplies and materials did not exceed $50.00, it was considered as free from any claim by the Government.

Schedules of all items in which the Government claimed an interest were prepared and are shown in an Appendix of this report. All items of the schedules were purchased by the Banner Mining Co. on the basis of settlement shown in the following tabulation:

Table 2. - Summary of Schedules.

Article	Schedule	Cost	Basis of Settlement	Amount
Operating Equipment purchased	(1)	$2,165.25	100% of cost to project	$2,165.25
Physical improvements	(2)	21,648.31	100% of cost to project	21,648.38
Electrical Supplies, Equipment and Accessories	"A"	856.03	35% of cost to project	299.61
Tools & Small Equipment	"B"	237.61	30% of Cost to project	71.28
Hose, Air & Water	"C"	119.88	35% of cost to project	41.96
*Pipe	"D"	2,671.64	5% above net salvaged value	449.19
Pipe fittings	"E"	729.03	20% of cost to project	145.81
*Track	"F"	2,776.55	5% above net salvaged value	585.27
Track accessories	"G"	443.35	25% of cost to project	110.84
Drill steel & bits	"H"	133.51	25% of cost to project	33.38
Totals		$31,781.23		$25,550.97

Government interest, 50% $12,775.49

Reimbursement due Government $12,775.49

*An abstract of bids for the purchase of these items is included in the Appendix of this report.

The Banner Mining Co.'s check for $12,775.49, payable to the Treasurer of the United States, was forwarded to the Field Team of Region IV on May 7, 1953.

PRODUCTION PLAN

The Banner Mining Co. is continuing to develop the mine and has started the construction of a 300-ton flotation mill on the property. The company has secured a production contract from the Defense Materials Procurement Agency which covers the purchase of 12,960,000 pounds of copper over a period of 3 years at a guaranteed price of 31 cents a pound. The contract provides also for a Government loan amounting to not more than $473,665, repayable in 4.5 years and bearing 5 percent interest. The company is obligated under the contract to expend $90,000 to its own funds. The mill is expected to be completed early in 1954 and thereafter copper production should exceed 4,000,000 pounds a year.

The ore will be mined by modifications of inclined room-and-pillar, and shrinkage methods. The ore bodies range from 2 to 30 feet in thickness and for the most part have an average dip of about 35°. Roof bolting has been tried experimentally with indications that by its use less timber and pillar supports will be necessary. About 15 percent of the ore is expected to be lost in unreclaimed pillars. Triple-drum slusher hoists with scrapers will be used to pull the broken ore from the flat slopes down to the haulage levels.

Ore dressing tests have shown that it is possible to recover from 93 to 97 percent of the copper, and about 65 percent of the silver in a flotation concentrate. By tabling the flotation tailings, the tests indicated that from 50 to 60 percent of the scheelite could be recovered. This table product after roasting and removal of the iron by magnetic separation, yielded a concentrate containing 64 percent WO_3. Laboratory work to date has not shown a satisfactory recovery of the molybdenum.

On the basis of the recoveries shown by the tests, Mineral Hill ore, having an average content of 0.7 ounces of silver per ton and 2.5 percent copper, would yield a concentrate containing 4.8 ounces of silver and 25 percent copper with a ratio of concentration of about 10.5 to 1.

Under the ore purchasing contract existing between the Banner Mining Co. and the American Smelting and Refining Co., a concentrate of this grade would have the following outcome:

		Per ton
Ag - 4.8 ozs. x .95 = 4.56 ozs. @ (90.5 less 1.5) cts		$4.06
Cu - 500 lbs. less 20 lbs. @ (31 less 3.08) cts.		134.02
Gross value		$138.08
Trucking to rail ----------	$0.80	
Freight (Sahuarita to El Paso), wet ton -----	7.12*	
Treatment ----------	8.76	
Assaying ----------	0.18	
Marketing cost ----------	$16.86	$16.86
Net smelter value of concentrates ----------		$121.22
Net smelter value of ore (10.5 to 1) ----------		11.54
Credit 0.5 pounds WO_3 @ $3.25 ----------		1.62
Total net value of ore ----------		$13.16

*Based on 9 percent moisture

It is the opinion of the ore purchasing agent of the American Smelting and Refining Co. that a more favorable freight rate can be established for concentrates between Sahuarita and El Paso. The new rate, if established, would, in effect, increase the net value of the ore about $0.25 a ton over that shown above.

Estimated operating costs are as follows:

	Per ton
Mining, including development	$8.50
Milling	1.75
Overhead	0.60
Royalties* (10% net smelter)	1.32
Total	$12.17

*Royalties include 5 percent to DMEA and 5 percent to property owner.

On the basis of these estimates an operating profit of about $1.00 a ton is indicated before interest, income taxes, depreciation, and depletion are taken into consideration. It appears that the DMEA loan of $51,127 can be repaid by a 5 percent royalty within one year after the mill reaches full production. After that is accomplished the operating profit will be increased to $1.66 a ton, so long as 31 cents a pound is received for the copper.

ADDITIONAL EXPLORATION WORK

Geophysical Surveys made early this year (1953) for the Banner Mining Co. showed 2 or more anomalies in an area some 3,000 feet east of the Mineral Hill mine. This area is outside the boundaries of the 3 claims involved in the Defense Minerals Exploration Administration contract. Diamond drilling that followed the geophysical work to date has indicated that at least one of these anomalous areas contains

substantial copper ore bodies. One of the drill holes at a depth of 35 feet penetrated 65 feet of ore containing about 5 percent copper. At one time the company planned to request Governmental assistance for the further exploration of these favorable areas but recently decided to continue the work without outside aid. As a result of the successful outcome of the initial Defense Minerals Exploration Administration assistance, the Banner Mining Co. was able to arrange for adequate private finances.

Possibilities exist for the discovery of additional ore bodies within the Mineral Hill ore zone. This appears especially true on the 700 level where further lateral exploration would surely be warranted. It is the intent of the company to explore all favorable areas from time to time during the course of the operation. As the ore reserves appear adequate for the time being, it is the aim of the operator to get the property into production as soon as possible.

CONCLUSIONS

The efforts of the competent staff of the Banner Mining Co., aided by the financial assistance of the Defense Minerals Exploration Administration, resulted in the disclosure of ore bodies, which no doubt in the near future will become a substantial source of copper and appreciable amounts of tungsten. Had it not been for the Government aid rendered in this case it is quite probable that the Mineral Hill mine would still be dormant as it was for 30 years prior to the initiation of the present joint project.

DMA-269X-A, CONTRACT I-DMA-E32
BANNER MINING CO.'S MINERAL HILL COPPER MINE
PIMA MINING DISTRICT
PIMA COUNTY, ARIZONA

APPENDIX

Schedules 1, 2, and A. to H. inclusive.
Abstract of bids, Schedules D and F.
Ore Reserve Estimates by Operator.

September 1953

SCHEDULE (1)

OPERATING EQUIPMENT PURCHASED

Item	Quantity	Original cost
Saw, Electric (Skillsaw)	1	$165.00
Typewriter	1	135.00
Calculator	1	745.20
Cable, Hoist 3/4"	1200'	374.40
Welder, Arc	1	592.10
Hoist, Yale, 2 ton	1	153.55
Total		$2,165.25

SCHEDULE (2)

PHYSICAL IMPROVEMENTS

Item	Cost
Initial rehabilitation and repairs	$4,001.12
New buildings, improvements	17,647.26
Total	$21,648.38

SCHEDULE "A"

ELECTRICAL SUPPLIES, EQUIPMENT AND ACCESSORIES

ITEM	QUANTITY	COST CHARGES TO THE PROJECT
Cable, R. C. 3 Cond. No. 10	125'	$46.25
Cable, R. C. 3 Cond. No. 10	125'	46.25
Cable, R. C. 3 Cond. No. 10	125'	46.25
Cable, R. C. 3 Cond. No. 10	125'	46.25
Signal, Benhamin Industrial 110 V. #8652	1	15.14
Contactor, Crouse Hinds AF-15	1	10.00
Switch, S-D Safety, Type C #413114311	1	15.80
Cable, THFA, 3 Cond. Armored No. 9	85'	14.78
Control, 110V, B/W, Type LH Floatless	1	16.00
Relays, Contraol, GE #CR2810-B11AA1A	2	22.05
Switch, Wadsworth 3 Pole, 200A 575V #8623X	1	38.05
Switch, Safety, CH, 30A, 600V	1	15.80
Switch, Wadsworth 3 Pole, 200A 575V #8623	2	76.10
Switch, Control, Liquid, Type DH, 440V	1	18.00
Controller, B/W, 6 Cy, 440 V, Type LH	1	18.60
Switch, SD, 200A, 575V	1	46.20
Fuse, Renewable, 200A 575V	3	16.08
Switch, Control, B/W, Type LH, Floatless	1	18.60
Switch, Crouse Hinds, AF7	2	15.00
Receptacle, Crouse Hinds, Arktite #AR1031	1	19.92
Fuse, Renewable, 400A 600V	3	32.13
Signal, Shaft, Crouse Hinds, AF-7	1	7.50
Howlers, Benhamin #8652	2	30.28
Telephones, (Banner Made)	3	28.50
Signal Bell, Edwards Adaptabell, 6" 60 Cy. 115 volts	1	20.10
Howlers, Benhamin, #8652	2	30.28
Control, Elec. B/W, Type L, 440V	1	15.90
Switch, Signal, Crouse Hinds AF-6	2	15.00
Consuit, Greenfield, Flexible	12'	14.46
Horn, Signal, Edwards, Adaptahorn	1	13.28
Switch, Magnetic, Ge, 50 HP, 600V	2	80.00
Signal, Shaft, Crouse Hinds, AF-7	1	7.50
Total		$856.03

SCHEDULE "B"

TOOLS AND SMALL EQUIPMENT

ITEM	QUANTITY	ORIGINAL COST
Bar, Wrecking	1	$4.58
Saw, Timber	1	4.75
Brace, Carpenter's	1	3.93
Saw, Hand	1	4.75
Hammer, 12#	1	4.24
Hammer, 4#	1	1.83
Wrench, Pipe 18"	2	7.20
Wheelbarrows, Rubber Tired	2	45.40
Level, Carpenter's	1	1.80
Vise, Pipe 2"	1	17.30
Roller, Timber	11	47.52
Car, Mine 20 Cu. Ft.	1	25.00
Benders, Rail	2	69.31
Total		$237.61

SCHEDULE "C"

HOSE, AIR AND WATER

ITEM	QUANTITY	ORIGINAL COST
Hose, Air, 3/4"	100'	$70.00
Hose, Water, 1/2"	50'	27.38
Hose, Discharge, 2"	20'	22.50
Total		$119.88

SCHEDULE "D"

PIPE

ITEM	QUANTITY	ORIGINAL COST	WEIGHT POUNDS
Pipe, Galvanized, 1/2"	10'	1.45	8.5
Pipe, Galvanized Conduit, 3/4"	20'	3.14	22.6
Pipe, Black 3/4"	294'	30.38	335.2
Pipe, Galvanized, 3/4"	84'	11.72	95.8
Pipe, Black 1"	2121'	346.60	3,559.0
Pipe, Black 2"	1554'	534.78	5,675.2
Pipe, Black 2"	50'	17.55	182.6
Pipe, Black, 3"	63'	39.93	477.2
Pipe, Black 3½"	3.5'	1.78	31.9
Pipe, Black, 4"	1575'	1,575.71	16,994.3
Pipe, Black, 6"	60'	108.60	1,138.4
Total	5,834.5	$2,761.64	28,520.7 or 14.26 tons

SCHEDULE "E"

PIPE FITTINGS
(Charged to "Supplies Other" on Form MF-104)

ITEM	QUANTITY	ORIGINAL COST
Pipe Fittings	Miscellaneous*	$729.03
Total		$729.03

* These items are too numerous to inventory, therefore settlement is proposed on the basis of a percentage of the total cost to the project.

SCHEDULE "F"
TRACK

Item	Quantity	Original Cost	Weight Pounds
Rail, 20#	2,700'	$1,331.28	18,000
Rail, 16#	1,140'	462.36	6,080
Rail, 16#	915'	366.61	4,880
Rail, 16#	750'	298.50	4,000
Rail, 12#	1,050'	317.80	4,200
Totals	6,555'	$2,776.55	37,160 or 18.58 tons

SCHEDULE "G"
TRACK ACCESSORIES
(CHARGED TO "SUPPLIES, OTHER" ON FORM MF-104)

Item	Quantity	Original Cost
Bolts, Spikes, and Fish Plates	Miscellaneous*	$443.35
Total		$443.35

* Items too numerous to inventory, therefore settlement is proposed on the basis of a percentage of the total cost to the project.

SCHEDULE "H"
DRILL STEEL AND BITS

Item	Quantity	Original Cost
Drill Steel	43	$121.07
Drill Bits	45	12.44
Total		$133.51

ABSTRACT OF ATTACHED BIDS, SCHEDULES "D" (PIPE) AND "F" (TRACK)

ARTICLE	BOB BARRETT MACHINERY CO. BID PER TON	A AMOUNT	PAUL SMITH BID PER TON	AMOUNT	HIGH BID	ESTIMATED SALVAGE COSTS	NET SALVAGED VALUE	BANNER MINING COMPANY BASIS	AMOUNT
Pipe-28,520.7# - 14.26 Tons	$65.00	$926.90	$62.00	$884.12	$926.90	$499.10	$427.80	Net Salvaged Value plus 5%.	$449.19
Track-37,160# - 18.58 Tons	$65.00	$1,207.70	$62.00	$1,151.96	$1,207.70	$650.30	$557.40	Net Salvaged Value Plus 5%.	$585.27

BANNER MINING COMPANY
TUCSON, ARIZONA

ORE RESERVES
MINERAL HILL MINE
By B. W. Venable

The following is my estimate of ore reserves at the Mineral Hill Mine, Pima County, Arizona, based on all data available to date. Reserves are classified as measured and indicated, with an additional classification more speculative than the other two, and not strictly a reserve, of inferred. These classifications could also be called proven, probable and prospective. An explanation of the classification system is included at the end of this report.

LOCATION	TONS MEASURED	TONS INDICATED	TONS INFERRED	TONS TOTAL	COPPER ASSAY	SILVER ASSAY	WO_3 ASSAY	MoS_2 ASSAY
Above 300 Level	8,300*	26,700**	None	35,000	3.21%	0.78	0.06	0.05
Between 300 & 500 Levels	23,200	151,000	None	174,200	2.95%	0.78	0.05	0.05
Between 500 & 600 Levels	30,300	119,700	None	150,000	2.39	0.78	0.05	0.05
Between 600 & 700 Levels	22,600	66,700	80,900	170,200	2.35%	0.78	0.05	0.05
TOTALS	84,400	364,100	80,900	529,400	2.61%	0.78	0.05	0.05

*Pillars
** West Side up 40 feet

Note: The above estimate disregards the necessity of leaving pillars when mining, which will reduce the net available reserve by about 15%. The effect of dilution is also disregarded, which would be to increase the tonnage and decrease the grade by the percentage of diluent waste rock.

CLASSIFICATION SYSTEM

Definitions-

Measured Ore (Proven)

"If there is virtually no risk of failure in continuity between the faces sampled, or if a block is so extensively surrounded by sampled faces that risk is reduced to a minimum, the ore may be designated as proved."

It is my personal belief, based on my own observation of all sampled faces, that by projecting the sampled areas shown on the accompanying maps 10 feet vertically above and below each level, the condition of "virtually no risk of failure" in the above definition can be met. This method is therefore used in the calculation of Measured Ore in this report.

Indicated Ore (Probable)

There are mineralized areas exposed in plan on each of the developed levels. No connection between any ore body exposed on the 500, 600 or 700 levels with an ore body on the level above or below it has yet been demonstrated by any mine opening now existing. The dip of the single known continuous ore body that extends from above the 200 level to below the 300 level indicates its termination above the 500 level. The geological evidence in this and other mineralized areas indicates the probability that: since mine levels follow the 45 degree footwall fault, they are offset from the steeply dipping orebodies exposed on the levels immediately above and below.

As stated above, continuity of known orebodies from level to level has not been demonstrated. However, geological evidence indicates the probable existence of undeveloped orebodies between levels, and the further probability that the area of ore exposed on any given horizontal plane between two mine levels will approximate the average area of ore exposed on the two levels.

Therefore, the method used to compute Indicated Ore Reserves (Probable Ore) has been as follows:

Average the horizontal area of ore exposed on each of two successive levels, and multiply this average area in square feet by the vertical distance between the two levels in feet, to arrive at the ore volume in cubic feet. This result is then divided by 10.5 cubic feet per ton (the average of several density measurements) to arrive at the total reserve tonnage between the two levels. Measured ore in the same block of ground is subtracted from the total reserve to arrive at the Indicated Ore Reserve.

Inferred Ore (Prospective)

Where there exists no known geological reason why a mineralized area cannot be projected beyond its exposed limits into virgin ground, the best estimate possible of this projected extension is made, and it is classified as Inferred Ore. In this report, only one area is classified as Inferred, namely: the major portion of the ground between the 600 and 700 levels. This mineralized area is inadequately prospected on the 700 level, and two diamond drill holes down to the granite from 600 #6 West Crosscut show mineralization extending down to granite in that area. No reason is known why a cross section of ore similar in volume and grade to that exposed on the 600 level cannot be found on the 700 level with adequate prospecting. The Inferred Reserve shown in the table is based on this assumption.

Calculation of Grade

Copper grade of blocks of ore shown on the plan maps have been calculated by the most logical method in each case, weighting sample assays by length of cut and sample interval.

Level averages have been arrived at by weighting each exposed ore body average assay by its area in horizontal plan. Between-level averages are computed by weighting the level averages above and below by their respective ore areas in horizontal plan.

Silver assays are arithmetic averages of the most reliable data available.

WO_3 and MoS_2 averages are based on composite sample assays.

/s/ B. W. Venable

Mining Division
Date Rec'd.
MAY 22 1953

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES
MINING DIVISION
REGION IV

BUREAU OF MINES
Denver, Colorado
TUCSON, ARIZONA

SOUTHWEST EXPERIMENT STATION
Box 4097
UNIVERSITY STATION

Defense Minerals Administration
RECEIVED
OCT - 8 1953

May 19, 1953

Registered- return
receipt requested.

Memorandum

To : W. H. King, Chief, Mining Division, Region IV

From : Chief, Mining Methods Br., Mining Div., Region IV

Subject : Final Operator's Report, Contract I-DMA-E32, Docket DMA-269XA, Banner Mining Co's. Mineral Hill Copper Mine, Pima Mining District, Pima County, Ariz.

Enclosed are original and four copies of the final operator's report for Contract I-DMA-E32.

The Bureau of Mines final report probably will be completed this week.

Walter R. Storms

Walter R. Storms

CC W. H. King (4)
DMA-269XA
DF

PHONE 6-9271

HOME OFFICE
1910 FIRST NATIONAL BLDG.
OKLAHOMA CITY, OKLA.

BANNER MINING COMPANY

2042 CONNER STRAVENUE TUCSON, ARIZONA

A. B. BOWMAN
SUPT.
ARIZONA OPERATIONS

H. I. GRIMES • PRESIDENT

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
MAY 18 1953

Defense Minerals Administration
224 New Customhouse Building
Denver, Colorado

Re:- Contract #I-DMA-E32, Pertaining to the Mineral Hill Mine South of Tucson, Arizona.

FINAL REPORT

Gentlemen:-

Banner Mining Company, a Nevada Corporation, applied for an exploration project on a portion of the Mineral Hill and Plumed Knight Mining Claims on December 18, 1950. The patented claims involved are named as follows:- Banes, Copper Hill and Milton.

On June 29, 1951, we were granted an Exploration Project, Contract #I-DMA-E-32, DMA Docket #269-X-A. The total amount of this contract was for $126,789.00. Of this total, the Government and Banner Mining Company were to participate on a 50%- 50% basis on costs incurred as per contract.

On August 7, 1951, we commenced work on this project. Work proceeded continously thereafter until the exhaustion of funds under the project in December 1952. Since December 1952, Banner Mining Company has continued to do exploration and some development work. This work we have done since completion of the project has added to the ore reserves and same are included in the attached Ore Reserve Report.

The following is a list of work completed in the period August 7, 1951 through December 1952 and same is tabulated on an attached sheet:-

1. Initial rehabilitation and repairs on existing facilities together with the power installation and transformer station was completed at a total cost of $11,919.89. This work is broken down as follows:-

(a) Building and installing bins in the warehouse to facilitate the storing and handling of supplies at a total cost of $344.77.

(b) A portion of the warehouse building, which we had erected on the property before commencing the project, was walled off for office space at a total cost of $418.04.

Refund?

(c) A deposit of $9,700.00 was made to the Trico Electric Co-Operative for the purpose of building a power line to the mine and for the installation of the main substation.

(d) Power lines and necessary electrical apparatus to bring power to the motors of surface equipment were completed at a cost of $1,457.08.

Contract #I-DMA-E32 (continued)

2. A 40' X 40' Steel frame shop and changeroom building was erected on the property at a total cost of $7,377.42. Only one half of this amount was charged to the project.

3. A 45 foot wooden headframe was framed and erected at the collar of the inclined shaft. Provision was made for dumping the skip. A 75 H. P. single drum hoist was installed at this location. The total cost of these installations was $6,086.51.

4. A 20' X 25' wood frame galvanized V crimp clad hoist house was constructed near the collar of the incline shaft to house the 75 H. P. single drum hoist. Aluminum window frames were used throughout. It has a dirt floor. The total cost of this job came tO $1,252.34.

5. The Inclined Shaft was cleaned out, unwatered, retimbered when necessary to a total inclined depth of 830 feet below the collar. Water and air pipe lines together with rail, power and signal cables and ladders etc. were installed over the entire depth. This work was done at a total cost of $48,547.51. The cost on this particular job exceeded estimates mainly because of excess amounts of rock, mud, old timbers and debris encountered over a large portion of the shaft together with more water than had been anticipated. The upper 325 feet of the shaft had to be completely retimbered.

6. 848.5' of drifts and crosscuts AND 146' OF RAISES on the 500 level were cleaned out and retimbered where necessary. The total cost of this work came to $10,659.02. This work was carried out in relatively good underground conditions. However one cave on the west side of this level caused considerable trouble and had to be spiled as did one area just south of the shaft.

7. 2,077' of drifts and crosscuts and 205' of raises were cleaned out on the 600 level. These drifts, crosscuts and raises required considerable timbering. In three badly caved areas, spiling was necessary in order to re-open sections of drifts and crosscuts. The raise on the west side of the 600 level was badly caved and filled with highly brecciated altered limestone. It had the appearance of mixed plaster and was very hard to handle. This work was done at a total cost of $32,092.21, which was considerably above estimates because of conditions described above which were difficult to say the least.

8. 208.5' of crosscuts on the 700 level were cleaned out and retimbered when necessary at a total cost of $1,020.99.

9. A Brunton-Tape Survey was made of the 500, 600 and 700 levels of the mine and maps were completed to scale which showed the samples taken, assay of samples and the geology of each level. Most of this type of work on the 700 level was done after completion of the project and was not charged to the project or the Government. All the work in reopening the 700 level beyond that listed under paragraph (8) above was done after completion of the project and was 100% paid for by Banner Mining Company.

10. A total of 293 cut samples were taken on the 500, 600 and 700 levels. From these samples the following determinations were made:-

293 For Copper
105 For Silver
14 for WO_3
23 For MoS_2
13 For Zinc

Grab samples were also taken during the cleanup work in mineralized areas. The assaying on samples from the 700 level were not charged to the project.

Contract #I-DMA-E32 (continued)

A total of 870 feet of accessible drifts and crosscuts on the 300 level were sampled by the company. 221 cut samples were taken in this area. From these samples on the 300 level, 221 determinations were made for copper, 167 for silver, 11 for MoS_2 from composites of other samples and 5 determinations for WO_3 from composites of other samples. The cost of all the sampling and assaying on the 300 level was done at no cost to the Government. This level was also surveyed and mapped at no cost to the project or Government. Total cost of sampling and mapping together with cost of assays amounted to $2,549.05. This does not include the cost of work done by Banner Mining Company.

Plan maps of the 300, 500, 600 and 700 levels showing the geology, location of workings and assays are attached hereto and made a part of this report.

A geological report and an ore estimate of the Mineral Hill Mine , prepared by our superintendent, B. W. Venable, are attached to and made a part of this report.

The ore reserves in this mine as opened by this exploration project and subsequent work by Banner Mining Company are estimated to total 529,400 tons averaging 2.61% copper and 0.78 ounces of silver per ton. Small amounts of WO_3 and MoS_2 are also contained in this ore. These reserves fall into 3 classifications, Namely:- (1) Measured 84,400 Tons, (2) Indicated 364,100 tons and (3) Inferred 80,900 tons. The attached Ore Reserves Report breaks the reserves on each level into the three catagories with the estimated grade on each level.

About 300 tons of ore averaging an estimated 1% copper have been set aside on the dump for possible future milling. This low grade ore came from the various parts of the mine during the cleanup work.

Since completion of the project and up to May 1, 1953, Banner Mining Company has stockpiled 1,582 tons of ore on the surface for future milling which averages 4.34% Copper. This ore is coming from development work we are doing mainly on the 600 level of the mine.

We have plans for further developing and later the mining and milling of the Mineral Hill Mine ores. In this respect we have applied to the Defense Minerals Procurement Administration in Washington, D. C. for financial aid together with a floor price for the copper thus produced to further equip the mine and to erect a 300 ton concentration mill on the property.

Negotiations have been carried on with the D. M. P. A. since last October for a contract embodying the above mentioned ideas. It now appears very likely that a contract will be concluded sometime during the month of May which will allow us to further develop the mine and prepare and equip it for production and to build a mill all within the next twelve months.

Metallurgical Testing on the Mineral Hill Ores has been carried out by the Galigher Company of Salt Lake City, Utah for Banner Mining Company with the following conclusions:-

(1). All of the sulphide ores are amenable to present day standard concentrating equipment and procedures.

(2). Copper recoveries in the various final tests averaged from 93% to 97%.

(3). It is possible to recover about 50% of the Tungsten and to make a marketable Tungsten concentrate up to 64% WO_3 in grade by tabling, roasting and finally by magnetic separation of the contained iron.

Contract #I-DMA-E32 (continued)

(4) Recovery of the Molybdenite is a good possibility but further testing will be required after the mill is in operation so that the copper concentrates which will contain the molybdenite will be available for test purposes.

All of this metallurgical work was done at the expense of Banner Mining Company and was not charged to the project or the Government.

The accounts for the full term of the Mineral Hill Project have been audited by Mr. Brading and Mr. Townsend of the Denver Office of the Bureau of Mines.

We submitted our proposal for the settlement of the Government interest in property purchased jointly by our company and the Government for use on this project under contract #I-DMA-E-32 on March 2, 1953. This proposal was accepted by the Executive Officer of Region IV on March 13, 1953. Our check #A-3067 in the amount of $12,775.49 went forward on May 6th, 1953 in full payment of the Government equity in the above mentioned property.

A portion of the work as set up in the contract was not done on account of the exhaustion of funds. Certain parts of the rehabilitation program, as mentioned in previous paragraphs, cost considerably more than estimates because of bad underground conditions. This did not leave enough contract money to complete the work listed under Items 2 and 7 of the contract, namely:- The 1,000 feet of diamond drilling on the 500 and 600 levels and the 400 feet of drifting on the 600 level and the reopening of the vertical shaft. Banner Mining Company is proceeding with the reopening and rehabilitation of the vertical shaft at the present time at its own expense. It has been retimbered and put in operating shape down to a depth of 250 feet at this time.

Banner Mining Company, throughout the term of the project, installed various items of equipment, 100% owned by itself, for use on the project at no charge to the project or Government.

This report together with the enclosed Geologic Report, Ore Reserves Report, level maps showing geology, position of levels, assays etc. on each of the 300, 500, 600 and 700 levels, a Vertical Transverse Section of the mine and a Surface Geologic Map are intended as the final report under this project.

Respectfully submitted,

BANNER MINING COMPANY

A. B. Bowman

A. B. Bowman
Manager

ABB:ecb

P. S. The cost figures stated in this letter and attached cost sheet are subject to some revision and re-apportionment as the final audit report on this project has not been received by us at this date.

MINERAL HILL MINE
DMEA PROJECT - CONTRACT #I-DMA-E-32
SUMMARY OF WORK COMPLETED AND RELATED COSTS

	DESCRIPTION	ESTIMATED COST	ACTUAL COST	FOOTAGE REHABILITATED	ACTUAL COST PER FOOT
1.	Initial Rehabilitation and Repairs to Existing Facilities together with Power Installation.				
a.	Building Bins in Warehouse.	280.00	344.77		
b.	Walling of Section of Warehouse for Office Space.	300.00	418.04		
c.	Deposit for Power Line and Installing Necessary Electrical Equipment to Service Motors.	10,000.00	11,157.08		
2.	Erecting 40' x 40' Steel Frame Galvanized Iron Clad Shop and Changeroom Building. (½ of total cost.)	3,750.00	3,688.71		
3.	Erecting 20' x 25' Wood Frame, Galvanized Iron Clad Hoist House.	1,700.00	1,252.34		
4.	Framing & Erecting 45' Wooden Headframe, Installing Skip Dump, Installing 75 HP Single Drum Hoist.	6,300.00	6,086.51		
5.	Repair, Retimber where necessary to make accessible- 837' Inclined Shaft.	27,000.00	48,547.51	837.0'	$ 58.00
6.	500 Level Rehabilitation.	11,200.00	10,659.02	994.5'	10.72
7.	600 Level Rehabilitation.	12,600.00	32,092.21	2,282.0'	14.06
8.	700 Level Rehabilitation.	3,500.00	1,020.99	208.5'	4.90
9.	Sampling and assaying, surveying and mapping.	2,900.00	2,549.05		
10.	Equipment Purchases.	8,656.00	2,165.25		
11.	Equipment (Depreciation)		2,034.29		
12.	Power Cost.		5,316.35		
13.	Freight & Transportation Cost.		877.82		
		Total	$128,209.94		

See notes on attached sheet

Summary of work completed and related costs- (continued)

Note:

(1) Compensation Insurance, Social Security and Unemployment Taxes etc. have been included in the costs of the various jobs.

(2) The Diamond Drilling and the Drifting as set up in item 7 of the contract was not done because of exhaustion of funds.

(3) The work of repairing the 500 foot vertical shaft and the headframe over it was not completed due to exhaustion of funds. However, Banner Mining Company is now proceeding with this work and this shaft has been rehabilitated to a depth of 250 feet at this time.

(4) The Total Estimated Cost of the project was $126,789.00.

BANNER MINING COMPANY
TUCSON, ARIZONA

ORE RESERVES
MINERAL HILL MINE

The following is my estimate of ore reserves at the Mineral Hill Mine, Pima County, Arizona, based on all data available to date. Reserves are classified as measured and indicated, with an additional classification more speculative than the other two, and not strictly a reserve, of inferred. These classifications could also be called proven, probable and prospective. An explanation of the classification system is included at the end of this report.

LOCATION	TONS MEASURED	TONS INDICATED	TONS INFERRED	TONS TOTAL	COPPER ASSAY	SILVER ASSAY	WO_3 ASSAY	MoS_2 ASSAY
Above 300 Level	8,300*	26,700**	None	35,000	3.21%	0.78	0.06	0.05
Between 300 & 500 Levels	23,200	151,000	None	174,200	2.95%	0.78	0.05	0.05
Between 500 & 600 Levels	30,300	119,700	None	150,000	2.39%	0.78	0.05	0.05
Between 600 & 700 Levels	22,600	66,700	80,900	170,200	2.35%	0.78	0.05	0.05
TOTAIS	84,400	364,100	80,900	529,400	2.61%	0.78	0.05	0.05

* Pillars
** West Side up 40 feet

Note: The above estimate disregards the necessity of leaving pillars when mining, which will reduce the net available reserve by about 15%. The effect of dilution is also disregarded, which would be to increase the tonnage and decrease the grade by the percentage of diluent waste rock.

CLASSIFICATION SYSTEM

Definitions-

Measured Ore (Proven)

"If there is virtually no risk of failure in continuity between the faces sampled, or if a block is so extensively surrounded by sampled faces that risk is reduced to a minimum, the ore may be designated as proved."

It is my personal belief, based on my own observation of all sampled faces, that by projecting the sampled areas shown on the accompanying maps 10 feet vertically above and below each level, the condition of "virtually no risk of failure" in the above definition can be met. This method is therefore used in the calculation of Measured Ore in this report.

Indicated Ore (Probable)

There are mineralized areas exposed in plan on each of the developed levels. No connection between any ore body exposed on the 500, 600 or 700 levels with an ore body on the level above or below it has yet been demonstrated by any mine opening now existing. The dip of the single known continous ore body that extends from above the 200 level to below the 300 level indicates its termination above the 500 level. The geological evidence in this and other mineralized areas indicates the probability that: since mine levels follow the 45 degree footwall fault, they are offset from the steeply dipping orebodies exposed on the levels immediately above and below.

As stated above, continuity of known orebodies from level to level has not been demonstrated. However geological evidence indicates the probable existence of undeveloped orebodies between levels, and the further probability that the area of ore exposed on any given horizontal plane between two mine levels will approximate the average area of ore exposed on the two levels.

Therefore, the method used to compute Indicated Ore Reserves (Probable Ore) has been as follows:

Average the horizontal area of ore exposed on each of two successive levels, and multiply this average area in square feet by the vertical distance between the two levels in feet, to arrive at the ore volume in cubic feet. This result is then divided by 10.5 cubic feet per ton (the average of several density measurements) to arrive at the total reserve tonnage between the two levels. Measured ore in the same block of ground is subtracted from the total reserve to arrive at the Indicated Ore Reserve.

Inferred Ore (Prospective)

Where there exists no known geological reason why a mineralized area cannot be projected beyond its exposed limits into virgin ground, the best estimate possible of this projected extension is made, and it is classified as Inferred Ore. In this report, only one area is classified as Inferred, namely: the major portion of the ground between the 600 and 700 levels. This mineralized area is inadequately prospected on the 700 level, and two diamond drill holes down to the granite from 600 #6 West Crosscut show mineralization extending down to granite in that area. No reason is known why a cross section of ore similar in volume and grade to that exposed on the 600 level cannot be found on the 700 level with adequate prospecting. The Inferred Reserve shown in the table is based on this assumption.

Calculation Of Grade

Copper grade of blocks of ore shown on the plan maps have been calculated by the most logical method in each case, weighting sample assays by length of cut and sample interval.

Level averages have been arrived at by weighting each exposed ore body average assay by its area in horizontal plan. Between-level averages are computed by weighting the level averages above and below by their respective ore areas in horizontal plan.

Silver assays are arithmetic averages of the most reliable data available.

WO_3 and MoS_2 averages are based on composite sample assays.

Bill Kenable

GEOLOGIC REPORT - MINERAL HILL MINE
PIMA MINING DISTRICT, PIMA COUNTY, ARIZONA
BANNER MINING COMPANY

Prepared April 27, 1953, By B. W. Venable

Docket No. DMEA 269-X-A

Beginning in August, 1951, and ending in December, 1952, The Banner Mining Company has been engaged in unwatering, reopening and examining the Mineral Hill Copper Mine in the Pima Mining District, Pima County, Arizona. This work has been done with Government participation under Defense Minerals Administration Contract No. I-DMA-E-32. This final geologic report at the conclusion of the rehabilitation project is in partial fulfillment of the terms of that contract.

INTRODUCTION

The Mineral Hill Mine is located about twenty miles south of the city of Tucson, Arizona, in the Pima Mining District and Pima County. It can be reached by driving west from the Nogales highway on Ajo Road to San Xavier Mission Road, then fourteen miles south on the Mission-Twin Buttes road to the mine approach on the east side of the Twin Buttes road. This route is all hard-surfaced except the last two miles. The mine can also be reached by way of Sahuarita, a crossroads cotton settlement with freight loading facilities about 18 miles south of Tucson on the paved Tucson-Nogales highway and Southern Pacific Railroad. The route to the Mineral Hill Mine goes west from Sahuarita seven miles to the Twin Buttes road, then four miles north along the Twin Buttes road to the mine approach described above. This route is all graded dirt between Sahuarita and the mine.

The area covered by this report comprises the patented Banes, Copper Hill, Jupiter and Milton lode claims, all patent survey No. 1649, and adjoining areas.

The section of this report entitled GEOGRAPHY AND GEOLOGY OF THE PIMA DISTRICT is quoted verbatim (with certain omissions) from E. D. Wilson's chapter on the Pima Mining District in University of Arizona Bulletin No. 156 (Bibliog. #5, this report). The remainder of the report is based on data collected by Banner Mining Company staff.

SUMMARY

Copper ore deposits of the Mineral Hill Mine are of the contact metamorphic type, formed in the sediments above a cupola of a granite stock, in or near the trough formed by the intersection of the N 80° E Striking Beta fault, which dips approximately 40 degrees to the south, and the northeast-southwest striking fault (herein called the Alpha fault) which dips steeply to the southeast and intersects the Mineral Hill Fault. Ore deposits bottom on the intrusive granite contact at a flat regional fault (herein called the San Xavier Fault) at approximately 700 feet depth.

Copper minerals occur in the area of contact metamorphism as replacements in limestone along shear planes and as disseminations in contact silicates. Ore bodies are up to 80 feet in width, and occupy a zone of about 500 feet in prospected length. The principal valuable mineral is chalcopyrite, with which is associated magnetite, pyrite, and small amounts of chalcocite, sphalerite, molybdemite and scheelite. The gangue consists of limestone breccia, marble, garnet, chlorite, epidote, quartz, jasperoid and other contact silicates. Copper concentration in various parts of the metamorphic area ranges from nothing to about 15%, with probably about 500,000 tons averaging between 2% and 3% copper and .05% or more WO_3.

GEOGRAPHY AND GEOLOGY OF THE PIMA DISTRICT

"The Pima District is on the eastern margin of the Sierrita Mountains. as generally considered, it comprises the Mineral Hill, San Xavier, Olive Camp and Twin Buttes areas. From the foot of the Sierrita Mountains a pediment slopes gently eastward toward the Santa Cruz Valley. This pediment ranges in altitude from approximately 4500 feet on the west to 3300 feet on the east. Rising prominently above it are scattered hills, such as the Twin Buttes, Helmet Peak and Mineral Hill. Numerous eastward-flowing arroyos carry the runoff of wet seasons eastward toward the Santa Cruz River. Topography of the district is shown on the Twin Buttes quadrangle sheet, published by the U. S. Geological Survey.

"Because of faulting, igneous intrusion, and alluvial cover, few if any of the sedimentary rock units are exposed in their original entire thickness. Over much of the area structural relations are obscure, and many features of the igneous bodies are not revealed."

"The following sequence for sedimentary rocks in the district has been proposed:

Upper Cretaceous
- Arkose with shale and thin limestone
- Recreation red beds
- Undifferentiated volcanics and sedimentary beds

Permian
- Snyder Hill limestone
- Quartzite
- Limestone
- Quartzite
- Limestone
- Shale, limestone, marl and gypsum

Pennsylvanian
- Naco limestone

Mississippian
- Escabrosa limestone

Devonian
- Martin limestone

Cambrian
- Abrigo formation
- Bolsa quartzite

"Bolsa quartzite: The oldest exposed formation, the Bolsa quartzite, crops out in the Twin Buttes and Mineral Hill areas.

"Southwest of Twin Buttes camp, the Bolsa attains a maximum thickness of approximately 600 feet. Its upper half characteristically weathers darker brown than does its lower half.

"At Mineral Hill the formation appears to be 600 feet thick.

"Abrigo formation: Silicified limestone, correlated with the Abrigo formation, occurs on Mineral Hill. It ranges from brown to light green and is estimated to be 350 feet thick.

"Martin limestone: Limestone containing Devonian Martin fossils is present at Mineral Hill, Twin Buttes, and west of the Contention Mine. Its exposed thickness ranges from 100 to 350 feet.

"Escabrosa limestone: Massive, cliff-forming granular limestone containing Lower Mississippian fossils occurs in the Mineral Hill, San Xavier Extension, and Twin Buttes areas. Characteristically, this limestone is relatively pure except for scattered chert nodules. Its apparent thickness is 350 feet at Mineral Hill and 375 feet at Twin Buttes.

"Naco limestone: The Naco, in contrast to the Escabrosa, consists largely of thin-bedded cherty limestone interstratified with thin shale. Commonly the shale has been metamorphosed to hornfels which stands out in relief on weathered surfaces. The Naco contains Pennsylvanian fossils. It is estimated to be 750 feet thick at Mineral Hill, 900 feet west of San Xavier, and possibly 1200 feet at Twin Buttes.

"Permian beds: A series of shale, limestone, marl, and gypsum lies stratigraphically above the Naco. Its apparent thickness amounts to a few hundred feet.

"Above the gypsiferous series are beds of quartzite and limestone. They in turn are overlain by the Snyder Hill limestone, which forms Helmet Peak.

"Cretaceous beds: The Cretaceous in this district includes undifferentoated volcanics, conglomerate, arkosic sandstone, shale, and quartzite; red shale, arkose and conglomerate similar to the Recreation Red Beds of the Tucson Mountains; and light colored arkose with local shale and limestone. The stratigraphic relation and thickness of these members is not clearly revealed.

IGNEOUS ROCKS

"Granite: Coarse-textured intrusive rock, ranging in composition from granite to quartz-monzonite and granodiorite, floors much of the pediment area of the district.

"Strong metamorphism and mineralization of the neighboring rocks suggests that the granitic mass invaded them. At Twin Buttes irregular masses of the granite intrude Bolsa quartzite. Southwest of the Senator Morgan Mine, tongues of granite invade Cretaceous beds.

"Porphry dikes of acidic to basic composition cut the sedimentary rocks and are believed to be related to the granitic intrusion. Likewise, irregular areas of andesite are younger than some of the Cretaceous beds and have been mineralized. Small masses of red basalt may be later."

GEOLOGY OF THE MINERAL HILL MINE

Sedimentaries

Sedimentary beds at the Mineral Hill Mine strike southeast and dip steeply to the southwest. Ore exposed in mine workings is principally in the Naco limestones and shales. Sedimentary beds northeast of the Mineral Hill fault are part of an overturned fold, with older beds overlying younger ones. Succession of beds southwest of the Mineral Hill fault is not clear.

Igneous Rocks

Granite is exposed in the footwall of the Mineral Hill fault at the 500 and 600 levels, and in the footwall of the Alpha fault at the 300 level. These exposures appear to be segments severed from the main intrusive body by faulting.

Granite is also exposed on the 700 level, diminishing grain size of constituent minerals in the granite as the contact with sedimentary rock is approached, indicates that this is an intrusive contact. This intrusive contact dips about 10 degrees to the ~~south~~east, and is coincident with the San Xavier thrust fault described below.

Faults

Mineral Hill Fault

The Mineral Hill fault strikes northwest and southeast, and dips at about 45 degrees to the southwest. It is prominent near the top of Mineral Hill, and can be traced on the surface for a distance of approximately 750 feet. It cuts off or joins the east-west striking Beta fault on the east, and the two faults combined have dropped Pennsylvanian Naco limestone and shale beds down alongside Cambrian Bolsa quartzite. Combined normal throw of the Mineral Hill and Beta faults is estimated at 3500 feet. The Mineral Hill fault appears to be mineralized east of the Mineral Hill Mine, near No. 3 shaft, but seems to have had no influence on orebodies in the mine itself. It traverses quartzite for most of its known extension at depth.

Alpha Fault

A fault zone about 200 feet wide cuts through the west side of the mine and apparently bounds known commercial mineralization on the west. This fault is herein identified as the Alpha fault. It strikes about N 30° E and dips steeply to the southeast. It is premineral, and appears to be offset by the Beta fault. The Footwall fault shown on the accompanying section strikes approximately parallel to the Alpha fault, and is probably an offset member of the Alpha fault system.

Beta Fault

A normal fault striking about N 80° E, and dipping from 30° to 50° to the south has played an important role in the formation of ore in this mine. This fault forms the footwall of most of the ore in the mine. It appears to have been the main channel for the mineralizing solutions that deposited the ore. It is herein called the Beta fault. The Beta fault is cut off on the east by the Mineral Hill fault. The combined normal throw of the two faults is estimated at 3500 feet.

San Xavier Fault

Between the 600 and 700 levels the Mineral Hill fault is cut off by a regional fault of east-west movement, north-south strike, and dip to east of approximately ten degrees. This fault will be referred to in this report as the San Xavier fault, but it has no generally accepted name. It lies upon, and parallel to the intrusive contact,

OREBODY CHARACTERISTICS

The orebodies of the Mineral Hill Mine are limestone replacements of the contact metamorphic type, all found in the hangingwall of the Mineral Hill Fault, and all structurally or genetically related to the Alpha and Beta faults. Sulfides are present in fault fissures, in shear zones, and as disseminations in areas of metamorphism. Metallic minerals found in the ore zones include pyrite, chalcopyrite, magnetite and chalcocite, in that approximate order. Gangue minerals identified include garnet, chlorite, quartz, epidote and muscovite. Scheelite is present in the ore in small quantities, and a little marmatitic sphalerite is found occasionally. Some molybdenite is also present.

The upper levels have been partially worked out by previous operators, but it appears that oxidized copper ore has been taken from the Alpha fault-fissure, from the Beta fault-fissure, and from bedding-plane fissures striking northwest and southeast and dipping about 70 degrees to the southwest. A single large stope, roughly circular to oval in plan, extends from the orebody's blind apex above the 200 level to the 300 level.

All of the orebodies exposed on the 300, 500, 600 and 700 levels fall into one or more of three general classes, as follows:

The first class, the one in which most of the best ore falls, consists of "banded ore" - chalcopyrite and other metallic minerals in sheeted shear zones in garnetose limestone breccia. These shear zones are found in many attitudes of both strike and dip; however the general attitude of many of these banded areas suggests that these shear fractures are on bedding planes of a thin-bedded limestone, probably the Naco formation, which is shaly. These banded areas are crumpled and overturned near the Beta fault. Characteristically, a patch of banded ore will start out in good ore from a footwall on the flatter-dipping Beta fault, and gradually grow poorer in sulfides up the dip as it gets farther from the fault. Two orebodies of this type have been observed to roll over in a sort of a dome at the apparent top of mineralization, with a roof of unmineralized limestone breccia. Orebodies of this type include those designated as 300 No. 1 (east side), 500 No. 2, 500 No. 3, 600 No. 2, and 600 No. 3.

A second type of orebody, found principally at fault intersections, consists of masses of black to dark green chlorite and other contact silicates, excluding garnet, traversed by stringers of pyrite. Some chalcopyrite and chalcocite is disseminated through these masses. Ore bodies of this type include those designated as 300 No. 1 (west side), 300 No. 2, 500 No. 4 and 600 No. 4. Several other mineralized areas of this type are too low in grade to be classified as ore.

A third type of ore, generally low in grade, but up to five percent copper in its better areas, is exposed on the 600 and 700 levels. This consists of massive jasperoid and brown garnet, in which is disseminated, both in grains and in quartzy stringers, chalcopyrite and pyrite. This body of garnet and jasperoid appears to be genetically related to the intrusive contact on the 700 level, as it appears only on the lower two levels, and it lies directly on the intrusive contact on the 700 level and in two drill holes drilled down to granite in this area from the west 600 level. The orebodies designated as 600 No. 1 and 700 No. 1 belong to this class.

GEOLOGIC HISTORY

The following is believed to have been the sequence of geologic events pertinent to mineralization at the Mineral Hill Mine:

1. Strong folding of sediments, either accompanied or followed by granitic intrusion of a district-wide stock. Granite is observed to have been offset by three of the known major faults in the Mineral Hill Mine, so it is concluded that the intrusion antedates the Alpha, Beta and San Xavier faults. Cretaceous sediments elsewhere in the district have been invaded by the granite, and it is probable that the granite is Laremide in age. The Mineral Hill Mine is in the steeply dipping limestone and shale beds of an overturned fold overlying the granite;

2. Movement of undetermined magnitude and direction along the northeast striking Alpha fault, resulting in a broad zone of brecciation;

3. Tensile movement on the Beta and Mineral Hill faults, with a normal throw of approximately 3500 feet, lifting a slice of granite from the north side of the granite cupola to its present outcropping position;

4- East-west movemant of undetermined magnitude along the regional flat-dipping San Xavier fault. This movement followed the top of the intrusive granite in a general way, However more or less horizontal strain relief planes showing slickensides and/or sulfide mineralization are found in the granite mass on the 700 level. and here and there in the sedimentaries throughout the mine;

5. Mineralizing solutions from a magmatic source apparently traveled up the Beta and probably also the Mineral Hill fault, producing metamorphosis of the overlying limestones and shales, ~~and~~ depositing sulphides and magnetite where conditions were chemically and structurally favorable.

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5. 1950 - Eldred D. Wilson, Chapter IV - Pima District, Univ. Ariz. Bulletin No. 156, Ariz. Bureau of Mines Geol. Series No. 18, Arizona Zinc and Lead Deposits, Part I.

ENCLOSURES

1. Geologic Plan Map of Mineral Hill 300 Level, 20 feet to the inch.

2. Geologic Plan Map of Mineral Hill 500Level, 20 feet to the inch.

3. Geologic Plan Map of Mineral Hill 600 Level, 20 feet to the inch.

4- Geologic Plan Map of Mineral Hill 700 Level, 20 feet to the inch.

5. Surface Geologic Plan Map of Mineral Hill Mine Area, with composite mine levels shown, 100 feet to the inch.

6- Vertical transverse section map through Mineral Hill Mine, Scale 100 feet to the inch.

7. Ore Reserve Estimate, Mineral Hill Mine, Banner Mining Co. inter-office communication.

700
FILE COPY
SURNAME:

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION
WASHINGTON 25, D. C.

MAY 29 1953

Ellis
Oetzel
Rubin
Chandler
Hedges
Smith
Selfridge
Jefferson

Mr. Russell Forbes
Acting Administrator
Defense Materials Procurement Agency
General Services Administration Building
Washington 25, D. C.

Re: Docket No. DMA-269X-1 (Copper)
Contract No. I-DMA-232
Banner Mining Company
Mineral Hill Copper Mine
Pima County, Arizona

Dear Mr. Forbes:

Enclosed is a copy of a "Certification of Discovery" certified to the captioned project, also a copy of the letter to the Operator. The Field Team's final report is not yet available. A copy of the report will be forwarded to you as soon as it is received in Washington, together with a brief summary of the work accomplished as a result of the exploration aid provided under this contract.

Sincerely yours,

C. O. Mittendorf

Administrator

Enclosures 2

EWEllis/gla 5-27-53

cc to: Adm. Reading File
Operating Committee
Mr. Hedges, Rm. 4604
Mr. Thayer, Rm. 5216 GSA Bldg.
Contract Adm. and Audit Division
Mails & Files (Docket)
Mr. Ellis
F. E. Johnson
Field Team, Region IV (2)

5-29-53

700

FILE COPY
SURNAME:

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION
WASHINGTON 25, D. C.

Ellis
G E Kane
Rutin
Chamberlin
Hedges
Raphael
Selfridge
H Johnston

Mr. M. L. Grimes, President
Banner Mining Company
2042 Conner Avenue
Tucson, Arizona

MAY 29 1953

Re: Docket No. [illegible]-2[illegible]-[illegible]
Contract No. [illegible]-32
Mineral Hill Copper Mine
Pima County, Arizona

Dear Sir:

Enclosed is a certification by the United States of a discovery or development under an exploration project contract. This certification covers the discovery made under the above contract at the Mineral Hill Copper Mine.

By the terms of the exploration project contract, as amended, and of the certification, all copper and other metal mine minerals produced from claims subject to the aforesaid contract, from June 29, 1951, the date of the contract, are subject to the Government's percentage royalty as set forth in the contract until the sum of $1,127.82 is paid, or until June 29, 1961.

Payments should be made to Mr. [illegible], Executive Officer, [illegible] Field Team, Region 17, 2[illegible] New Customhouse Building, Denver 2, Colorado. Checks should be made payable to the Treasurer of the United States. The purchaser should be advised to deduct the royalties from the amount due on each shipment and forward the check directly to the Executive Officer. Royalty payments to the Government should be accompanied by suitable evidence, such as copies of settlement sheets, showing quantity and grade of the products sold, the name of the purchaser, and the price and charges, certified to be correct by the purchaser.

You are requested to notify Mr. King of any changes in ownership or production rights that might have any effect on the Government's right to its percentage royalty. Also, if production ceases at any time for an extended period, please notify Mr. King at six-month intervals that no production has been made, when that is the case.

Sincerely yours,

G. D. Mitten
Administrator

Ellis/la 5-27-53

cc to: Adm. Reading File
Mr. Russell Forbes, Acting Chief, DMA
Super. Com. - Mr. Hedges - Mr. Shager
Field Team, Region 17 (2)
Docket
Mr. Ellis
Mr. Chamberlin - Mr. Johnson

P.N. 5-29-53

Mr. Wm. Ellis
5-[redacted]5-53
12:53 pm.

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
MAY 25 1953

BUR MINES DN 235 5-25-53 9-17 AM

WILLIAM ERNEST ELLIS PLS DELIER IMMEDIATLY

REURTELEPHONE CALL MAY 25,1953, DOCKET DMEA 269X-A, CONTRACT I-DMA-E32. COPPER MINERALS OCCUR IN THE ARAXXXX AREA OF CONTACT METAMORPHISM AS REPLACEMENTS IN LIMESTONE AKONG SHEAR PLANES AND AS DISSEMINATIONS IN CONTACT SILICATES. ORE BODIES ARE UP TO 80 FEET IN WIDTH, AND OCCPUY A ZONE OF ABOUT 500 FEET IN PROSPECTED LENGTH. THE PRINCIPAL VALUABLE MINERAL IS CHALCOPYRITE, WITH WHICH IS ASSOCIATED MAGNETITE, PYRITE, AND SMALL AMOUNTS OF CHALCOCITE, SPHALERITE, MOLYBDEMITE, AND SCHEELITE. THE GANGUE CONSISTS OF LIMESTONE BRECCIA, MARBLE, GARNET, CHLORITE, EPIDOTE, QUADXXXX QUARTZ, JASPEROID AND OTHER CONTACT SILICATES. COPPER CONCENTRATION IN VARIOU S PARTS OF THE METAMORPHIC AREA RANGES FROM NOTHING TO ABOUT 15 PERCENT, WITH PROBABLY ABOUT 500,000 TONS AVERAGING BETWEEN 2 PERCENT AND 3 PERCENT COPPER AND .05 PERCENT OR MORE WO3.

W H KING

Denver, Colo.

MAY 25 12 54 PM '53
BUREAU OF MINES
MAIL ROOM
WASHINGTON, D. C.

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
WASHINGTON 25, D. C.

224 New Customhouse
Denver 2, Colorado

May 21, 1953

Mr. Jay L. Chambers, Chief
Contract Administration & Audit Division
Defense Minerals Exploration Administration
Interior Building
Washington 25, D. C.

Re: Banner Mining Co.
Contract Idm-E32
Docket No. 269XA

Dear Mr. Chambers:

Enclosed are three copies of Audit Certificate and two copies of Audit Report for Banner Mining Company pertaining to Exploration Contract Idm-E32, Docket No. 269XA.

Also enclosed are copies of bids received from Paul F. Smith and Bob Barrett, together with copies of Regional Executive Officer's approval of acceptance of Banner Mining Company's bid.

I appreciate your clearing up the correct interpretation of Articles 5 and 6 in the above-mentioned contract. Your explanation throws an entirely different light on the matter.

In explanation, not extenuation, of my thinking, I am attaching schedule which I developed from the records of the fiscal officer, plus my interpretation of Paragraph 5, DMEA Circular 19, Supplement 4, governing handling of collections resulting from the disposition of Government's interest in project property.

Sincerely yours,

T. H. Brading
Auditor, Region IV

Enclosures

Total Expenditures per MF-104		$128,209.94
Total set up on Fiscal Records - also shown as Government's share on contract	$63,393.00	
As this is a 50% participation contract, multiply by 2		126,786.00
Excess over		$ 1,423.94
Disallowance per Audit Report	403.33	
Expenditures in excess of contract	1,020.61	1,423.94

Total Allotment	$63,393.00
Total Payments to Date	59,641.69
Balance Due Operator	$ 3,751.31

Total Allotment		$63,393.00
Less Settlement Check		12,775.49
Balance per Audit Certificate		$50,617.51
Total Payments to Date	$59,641.69	
Less Settlement Check	12,775.49	46,866.20
Balance Due Operator		$ 3,751.31

FILE COPY
SURNAME:

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
WASHINGTON 25, D. C.

MAY 18 1953

Mr. Thomas H. Breding
DMEA Auditor
244 New Customhouse Building
Denver 2, Colorado

Re: Idm-232, DMA-264EA
Banner Mining Company

Dear Mr. Breding:

The copies of the final Audit Certificate and Audit Report covering the subject contract, transmitted by your letter of May 12, 1953 are returned herewith for correction.

Your attention is called to the second sentence of Article 10 of the contract which states "Although the Government may pay part of the cost of new or additional facilities, structures, buildings, and equipment, only the depreciation on such items, computed as indicated in Articles 5 and 6, will be charged as a cost of the project." Articles 5 and 6 specifically state that only the difference between cost and salvage value are to be charged as a cost of the project.

Accordingly, the factual portion of your audit certificate should be restated as follows:

Total Cost as billed by contractor		$128,309.94
Less: Proceeds from Property Disposition		25,652.97
Adjusted Cost		102,656.97
Exceptions (see Audit Report for details):		
During this audit	$403.33	
Prior to this audit	-0-	403.33
Total Accepted Cost		$102,253.64

The amount payable to the contractor should be shown as $51,127.82 to reflect the correct allowable cost of the project. The reference to this improper disallowance of $1,020.61 also should be eliminated from page 9 of your audit report. (Incidentally, it appears that your computation of this excess, if proper, should have been $1,017.61).

The period covered, shown in both the audit certificate and report as "August 7, 1951 to December 31, 1952" should be extended to include the date of the Executive Officer's acceptance of the Operator's bid for the property. A copy of the acceptance letter also should be attached to the audit report.

Sincerely yours,

(Signed) J. L. Chambers

Jay L. Chambers, Chief
Contract Administration
and Audit Division

EDTalbert/wb
May 18, 1953

cc: Docket
Admr. Reading File
Mr. Chambers

Talbert
Chambers

F.N.
5-18-53

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
WASHINGTON 25, D. C.

224 New Customhouse
Denver 2, Colorado

May 12, 1953

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
MAY 15 1953

Mr. Jay L. Chambers, Chief
Contract Administration and Audit Division
Defense Minerals Exploration Administration
Interior Building
Washington 25, D. C.

Banner Mining Co.
Contract Idm-E32
Docket No. 269XA

Dear Mr. Chambers:

Enclosed are three copies of Audit Certificate and two copies of Audit Report for Banner Mining Company pertaining to Exploration Contract Idm-E32, Docket No. 269XA.

Also enclosed are copies of bids received from Paul F. Smith and Bob Barrett.

Sincerely yours,

T. H. Brading
Auditor, Region IV

Enclosures

Mr. C. O. Mittendorf

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
MAY 12 1953

Omea 269A

BUR MINES DN 235 5-12-53 9-46 AM

C O MITTENDORF

REFERENCE TELETYXXXX TLXXX TELEPHONE CONVERSATION ON MAY 12 WITH ELLIS CONCERNING DATE CONTRACT FUNDSWERE EXPENDED CONTRACT I-DMA-E32, BANNER MINING COMPANY. OPERATOR WORKED THROUGH MONTH OF DECEMBER 1952 AND OVER EXPENDED CONTRACT FUNDS BY AMOUNT OF $1,020.61, WHICH WAS ABSORBED BY THE COMPANY. BASED ON TOTAL EXPENDITURE FOR MONTH OF DECEMBER OF $8,926.72, THE DATE CONTRACT FUNDS WERE EXPENDED WOULD BE ON OR ABOUT DECEMBER 27,1952.

W H KING

Denver, Colo.

MAY 12 1 33 PM '53
BUREAU OF MINES
MAIL ROOM
WASHINGTON, D. C.

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
WASHINGTON 25, D. C.

224 New Customhouse
Denver 2, Colorado

May 8, 1953

Memorandum

To: C.O. Mittendorf, Administrator, DMEA

From: Executive Officer, DMEA Field Team, Region IV

Subject: Docket DMA 269X-A (Copper), Contract I-DMA-E32
Banner Mining Company, Mineral Hill Copper Mine,
Pima County, Arizona

Enclosed are copies of the following matter pertaining to the settlement of the Government's interest in property acquired under the subject contract:

1. Letter to Banner Mining Company dated May 8, 1953, in release of the Government's interest in all property acquired under contract.

2. Letter to Banner Mining Company dated May 8, 1953, in acknowledgment of the receipt of a check in the amount of $12,775.49, and transmittal of matter under item (1).

3. Memorandum to T.A. Christensen dated May 8, 1953, enclosing the check from Banner Mining Company.

W. H. King

W. H. King

Enclosures

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
MAY 11 1953

Banner Mining Company
2042 Conner Stravenue
Tucson, Arizona

Gentlemen:

The United States of America, acting through the Department of the Interior, Defense Minerals Exploration Administration, for a valuable consideration hereby sells, assigns, transfers and sets over to you all of its right, title and interest in all property acquired under Exploration Project Contract I-DMA-E32, Docket No. DMA 269X-A.

THE UNITED STATES OF AMERICA

By W. H. King
W.H. King, Executive Officer
DMEA Field Team, Region IV

Dated MAY 8 1953

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION
WASHINGTON 25, D. C.

224 New Customhouse
Denver 2, Colorado

May 8, 1953

Memorandum

To: T. A. Christensen

From: Executive Officer, DMEA Field Team, Region IV

Subject: Docket No. DMA-269X-A (Copper), Contract I-DMA-E32, Banner Mining Company, Pima County, Arizona

Enclosed is a check rendered by the Banner Mining Company made payable to the United States Treasurer, Washington, D.C., in the amount of $12,775.49 in payment for the Government's interest in property acquired under Contract I-DMA-E32.

Also enclosed is a copy of the Government's release of interest in the property acquired under the Contract, with a copy of the letter of transmittal to the Banner Mining Company.

W. H. King
W. H. King

Enclosures

JWT:jp
cc Contract
Chron
WHStorms
AHKoschmann
COMittendorf
JWTownsend

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION
WASHINGTON 25, D. C.

224 New Customhouse
Denver 2, Colorado

May 8, 1953

Banner Mining Company
2042 Conner Stravenue
Tucson, Arizona

Re: Docket No. DMA 269X-A
Contract I-DMA-E32

Gentlemen:

Receipt is acknowledged of your check in the amount of $12,775.49, made payable to the United States Treasurer, Washington, D.C., which was rendered in settlement of the Government's interest in property acquired under Contract I-DMA-E32.

The settlement is in conformance with your bid dated March 2, 1953, and the Government's acceptance thereof dated March 13, 1953.

A release of the Government's interest in all property acquired under Contract I-DMA-E32 is enclosed herewith.

Form MF-104, Operator's Monthly Report and Voucher, which you have submitted in claim for reimbursement for work performed during the month of December 1952 will be processed for payment upon receipt of the final engineering and geologic report, in compliance with article "13" of Exploration Project Contract Form MF-200.

Very truly yours,

W. H. King

W.H. King
Executive Officer, DMEA
Field Team, Region IV

Enclosure

JWT:jp
cc Contract
Chron
WKStorms
AHKoschmann
COMittendorf
TAChristensen
JWTownsend

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
WASHINGTON 25, D. C.

BD

224 New Customhouse
Denver 2, Colorado

May 6, 1953.

AIR MAIL

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
MAY 8 1953

Memorandum

To: C. O. Mittendorf, Administrator, DMEA

From: Executive Officer, DMEA Field Team, Region IV

Subject: Certification of Discovery, Contract I-DMA-E32, Docket DMA-269XA, Banner Mining Co.'s Mineral Hill Copper Mine.

Enclosed are three copies of a memorandum from the Chief, Mining Methods Branch, transmitting three copies of a Certification of Discovery for ore found in the Mineral Hill Mine under Contract I-DMA-E32.

We recommend that the Certification of Discovery cover all claims included in the contract as copper ore seems to have been found throughout the old Mineral Hill mine workings when it was unwatered and rehabilitated with DMEA funds.

W. H. King

W. H. King

Enclosures

MINING DIVISION
REGION IV

May 5, 1953

Memorandum

Air Mail

To : W. H. King, Chief, Mining Division, Region IV

From : Chief, Mining Methods Br., Mining Div., Region IV

Subject : Certification of Discovery, Contract I-DMA-432, Docket DMA-269KA, Banner Mining Co.'s Mineral Hill Copper Mine, Pima Mining District, Pima County, Ariz.

As requested in your phone call, we are enclosing a Certification of Discovery for ore found in the above mine under Contract I-DMA-432. The statement at the end of this certification is very general as copper ore seems to have been found very generally throughout the old Mineral Hill mine when it was unwatered and rehabilitated.

Walter R. Storms

Walter R. Storms

CC W. H. King (6)
DMA-269KA
DF

WRStorms:frj

CERTIFICATION BY THE UNITED STATES OF AMERICA
OF A DISCOVERY OR DEVELOPMENT UNDER AN
EXPLORATION PROJECT CONTRACT

To: Banner Mining Co.
2042 Conner Stravenue
Tucson, Arizona

Pursuant to the provisions of Exploration Project Contract No. I-DMA-E32, dated June 29, 1951, (Docket DMA-269XA), hereinafter called the "contract", between you and the United States of America, hereinafter called the "Government"; to establish and fix the Government's percentage royalty on production and its lien thereon and on the mineral deposit which is the subject of the exploration project, the Government considers and therefore certifies that a discovery or development has resulted from the work from which commercial production of ore may be made.

The Government's estimate of said discovery or development is particularly described and delimited as follows:

Ore was discovered in the Mineral Hill Copper mine when this mine was unwatered and rehabilitated, from the surface to the 700-foot level on the Banes, Copper, and Milton patented lode mining claims, patent survey No. 1649. These claims are located in section 2, Township 17 South, Range 12 East, Pima Mining District, Pima County, Arizona.

Dated:_____

THE UNITED STATES OF AMERICA

By_____
Administrator, Defense Minerals
Exploration Administration

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
MAY 8 1953

FILE COPY
SURNAME:

Ellis

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION
WASHINGTON 25, D. C.

T.S. in R. & R.

DMEA

5295 4640

14X3923.970 Working Fund, Interior, DMEA
May 5, 1953

W. H. King, Executive Officer, DMEA Field Team, 224 New Customhouse Bldg., Denver 2, Colorado
Docket DMA-269X-A (Copper) Contract I-DMA-232,
Denner Mining Company, Mineral Hill Copper Mine,
Pima County, Arizona

RECEIPT APRIL 28 BAMNER MINING COMPANY CONTRACT I-DMA-232

WHEN WAS PROJECT COMPLETED? ONLY 6 MONTHS REMAINING AFTER

THAT DATE TO ISSUE CERTIFICATE OF DISCOVERY. THERE APPEARS

LITTLE TIME REMAINING FOLLOWING RECEIPT OF REPORTS TO CERTIFY.

EWEllis/gla
cc to: Adm. Reading File
Docket
Confirmation, Region IV FT

C. O. Mittendorf (for)
C. O. MITTENDORF, ADMINISTRATOR

Mr. Ellis

SENT
MAY 5 1953
Clerical Service Section

5/4/53 gla

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
WASHINGTON 25, D. C.

224 New Customhouse
Denver 2, Colorado

April 28, 1953

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
MAY 1 1953

Memorandum

To: Chairman, Operating Committee, DMEA

From: Executive Officer, DMEA Field Team, Region IV

Subject: Docket DMA 269X-A (Copper), Contract I-DMA-E32, Banner Mining Company, Mineral Hill Copper Mine, Pima County, Arizona

Reference is made to your letter of April 21, 1953, concerning the final reports on work under the subject contract.

We have been advised by the Tucson office of the Bureau of Mines that they expect to receive the operator's final report in about two weeks from this date and that the engineer's and geologist's reports will follow about a week later.

W. H. King

W. H. King

FILE COPY
SURNAME:

F L Knouse
Ellis
Selfridge
Fehlmann
Wotkyns

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION
WASHINGTON 25, D. C.

Mr. W. H. King
Executive Officer
Mid Field Team, Region IV
224 New Customhouse Building
Denver 2, Colorado

APR 21 1953

Re: Docket [illegible]-2691-A (Copper)
Contract No. I-[illegible]-32
Sunset Mining Company
Mineral Hill Copper Mine
Pima County, Arizona

J. C. 4/21/53

Dear Mr. King:

According to the November, 1952, MF-104 Monthly Progress Report, transmitted with your memorandum of January 14, 1953, the work under the above-named contract was completed in late November or early December of 1952. We have noted your memorandum of March 18, 1953, and the enclosed copy of the Government approval of the Operator's proposal in the settlement of the Government's interest in physical improvements, equipment purchased and unexpended material and supplies purchased under the subject contract, which was executed by your office.

It is presumed that the Field Team is preparing its final report and will forward it to this office, together with the Operator's final report, as expeditiously as possible. However, since it is indicated that this project is to be certified, we wish to point out that the subject contract was written on the old form T-200 (April 1951), which allows a period of six months from "the date of termination or completion of the project," in which to issue the Certificate of Discovery.

We will appreciate being advised of the status of these reports and the approximate date we may expect to receive them.

Sincerely yours,

George C. Selfridge (GCS)

Chairman, Operating Committee

APPROVED:

J. H. Hodges (JHH)
Member, Bureau of Mines

A. R. Kinkel Jr. (ARK)
Member, Geological Survey

GLAult/FLKnouse/eef April 16, 1953
CC to: Adm. Reading Files
Oper. Committee
Docket
Messrs: ARKinkel DMA Rm. 4234
C. H. Johnson, Rm. 3621
Ellis. Knouse
DMEAFt. Region IV

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
WASHINGTON 25, D. C.

224 New Customhouse
Denver 2, Colorado

March 18, 1953

Memorandum

To: Secretary to the Operating Committee, DMEA

From: Executive Officer, DMEA Field Team, Region IV

Subject: Docket DMA 269X-A (Copper), Contract I-DMA-E32, Banner Mining Company, Pima County, Arizona

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
MAR 23 1953

Enclosed is a copy of the Government's approval of the operator's proposal in the settlement of the Government's interest in physical improvements, equipment purchased and unexpended material and supplies purchased under the subject contract, which has been executed by this office.

The basis for the company's bid is shown on the attached "Summary of Schedules". Complete data will be attached to the operator's final Form MF-104 Monthly Report and Voucher when it is processed for reimbursement for the amount of the Government's participation.

Approval for the disposal is deemed to be within the authority delegated to this office inasmuch as the items of greater cost were bid on at 100 percent of the cost to the project, approval for which would be only a matter of form.

The company considers the payment for the Government's interest in the property, as scheduled, to be in the nature of an interim payment on the total amount of Government participation in the exploration project inasmuch as the work effected a discovery in sufficient extent to repay the entire amount on a production royalty basis.

W. H. King

W. H. King

Enclosures

224 New Customhouse
Denver 2, Colorado

March 13, 1953

Banner Mining Company
2042 Conner Stravenue
Tucson, Arizona

Attention: Mr. A. B. Bowman, Superintendent,
Arizona Operations

Reference: Docket DMA 269X-A, Contract I-DMA-E32

Gentlemen:

Consistent with the authority delegated to this office under Order No. 2634 from the Office of the Secretary, Department of the Interior, we hereby accept your bid dated March 2, 1953, in the amount of $12,775.49 in settlement of the Government's interest in property and the unexpended portion of supplies and materials which were purchased under the terms of Contract I-DMA-E32.

Upon receipt of your check in the amount of $12,775.49 and your final engineering and geologic report, in compliance with the applicable provisions of articles "7" and "13" of Exploration Project Contract Form MF-200, your final Form MF-104 Report and Voucher for the month of December 1952 will be processed for reimbursement to you.

Very truly yours,

W. H. King

W. H. King
Executive Officer, DMEA
Field Team, Region IV

SUMMARY OF SCHEDULES

ARTICLE	SCHEDULE	COST	BASIS OF SETTLEMENT	AMOUNT
Operating Equipment Purchased	(1)	$2,165.25	100% of Cost to Project	$2,165.25
Physical Improvements	(2)	21,648.38	100% of Cost to Project	21,648.38
Electrical Supplies, Equipment and Accessories	"A"	856.03	35% of Cost to Project	299.61
Tools & Small Equipment	"B"	237.61	30% of Cost to Project	71.28
Hose, Air and Water	"C"	119.88	35% of Cost to Project	41.96
Pipe	"D"	2,671.64	5% above net Salvaged Value	449.19
Pipe Fittings	"E"	729.03	20% of Cost to Project	145.81
Track	"F"	2,778.55	5% above net Salvaged Value	585.27
Track accessories	"G"	443.35	25% of Cost to Project	110.84
Drill Steel & Bits	"H"	133.51	25% of Cost to Project	33.38
TOTALS		$31,781.23		$25,550.97
Government Interest 50%				$12,775.49
Reimbursement Due Government				$12,775.49

Department of the Interior
Defense Minerals Administration

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION
WASHINGTON 25, D. C.

224 New Customhouse
Denver 2, Colorado

January 22, 1953

Mr. Allen B. Bowman
Banner Mining Company
2042 Conner Stravenue
Tucson, Arizona

Re: Docket DMA 269I-A
Contract I-DMA-E32

Dear Mr. Bowman:

By the terms of the exploration project contract under which you are operating, the Government acquires an interest in property purchased for use on the project which is "....paid for or purchased with funds contributed jointly by the Operator and the Government...." Such property includes any individual items of equipment and facilities, buildings, or other fixtures costing more than $50.00 each. It also includes materials and supplies considered in groups or categories (such as pipe, explosives, rails, drill steel), if the original cost of the remaining unexpended portion of any such category of materials or supplies exceeded $50.00. As to any facility, building, fixture, or piece of equipment, and as to any such group or category of materials or supplies the original cost of which or the unexpended portion of which did not exceed $50.00, the Government does not assert any claim or interest under the terms of the contract.

The effect of the contract provisions is to make you the agent of the Government for the disposition of its interest in such property. Therefore it is your responsibility to make the best possible disposition of the property for the benefit of the Government. Every reasonable effort must be made to realize its full value. Such reasonable efforts might include: (1) Advertising in newspapers, periodicals, and posting notices in public places; (2) canvassing users of and dealers in such property; and (3) negotiating with the original vendor for the repurchase of the property.

Should you wish to retain the property or, in effect sell it to yourself, you may do this only after first having made every reasonable effort to procure a price higher than you yourself are willing to pay; or you may buy the Government's equity by paying for it either on the basis of the original cost or the ceiling price fixed by the Office of Price Stabilization, whichever is lower.

The undersigned is authorized to approve of and to join in the sale of such property for the joint account of the Operator and the Government. You are requested to advise this office in advance of the proposed disposition of any such property so that we may advise you if the Government will approve thereof and join in the transaction.

Upon completion of the exploration project or termination of the exploration project contract, your final report should include a detailed statement of the disposition you have made of such property. Proceeds from sales of property, or credit for its value in the event you retain it for your own account, should be indicated in your final monthly report, on form MF-104, by the insertion of suitable credits in the "Monthly Total" column.

Your final form MF-104 report will be withheld from processing for reimbursement to you until you have rendered your proposal in the settlement of Government equities in jointly owned property, until your final narrative report has been received, and until the final audit of the project accounts has been accomplished. In the event the final claim for reimbursement is insufficient to cover the settlement of equities in the jointly owned property, then it will be necessary for you to reimburse the Government for its equity in the property in the same manner as if the property had been disposed of to persons other than the operator.

With reference to the word "unexpended" used in the first paragraph, relative to supplies and material, there follows a definition provided by the Operating Committee, DMEA:

> "The word 'unexpended' means: remaining in some tangible form and with some salvage value. It follows that merely because track or pipe have been installed underground is not to say that they have been expended."

A review of your final form MF-104 indicates that it will be necessary for you to submit your proposal for the settlement of Government equities in the following purchases and installations made under the contract:

Item		Project Charge
Item (3)	Pipe	$ 2,135.53
Item (3)	Track	2,470.08
Item (3)	Other supplies - unexpended portion of hand tools, supplies, or materials which are a part of the charge of	7,488.53
Item (4)	Equipment purchases	2,165.25
Item (5)	Initial Rehabilitation and Repairs	11,919.89
Item (6)	New Buildings, Improvements, etc.	11,027.56
	Total	$37,206.84

Factors you may consider in ascertaining the salvage value of the pipe, track, etc., are: (a) Original cost; (b) cost of salvage; (c) resale value. Operating equipment values should be determined on

the basis of OPS rulings. Capital improvement values, such as the charges under Items (5) and (6), should be determined on the basis of original cost, normal depreciation and value to future operations.

The final audit of the project accounts cannot be scheduled until we are in receipt of your proposal for the settlement of Government equities. Therefore, we will appreciate advice as to when we can expect your proposal.

Very truly yours,

W. H. King

W. H. King
Executive Officer, DMEA
Field Team, Region IV

JWT:jp
cc Operating Committee (2)
WRStorms
Contract
Chron
AHKoschmann (2)
JWTownsend

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
WASHINGTON 25, D. C.

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
SEP 29 1952

224 New Customhouse
Denver 2, Colorado

September 26, 1952

Memorandum

To: C. O. Mittendorf, Administrator, DMEA

From: Executive Officer, DMEA Field Team, Region IV

Subject: Amendment No. 5 to Contract No. I-DMA-E32, Docket DMA 269X-A, Banner Mining Company

Enclosed are the original and two copies of Amendment No. 5 to Contract No. I-DMA-E32. Copies of this amendment have been given to the operator, the Fiscal Officer, Region IV, and a copy has been retained for our files.

Also enclosed are three copies of a letter from the operator requesting this amendment and three copies of a memorandum from the Chief, Arizona-New Mexico Branch, Mining Division, recommending this amendment.

W. H. King
W. H. King

Enclosures

SDS
9/29/52

FILE COPY
SURNAME:
TOG

J. L. Knowlton
Ellis
Hutchcroft

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
WASHINGTON 25, D. C.

AUG 7 1952

Mr. W. H. King
Executive Officer, Region IV
DMEA Field Team
224 New Customhouse Building
Denver 2, Colorado

Re: Docket No. 269A and
269B (Copper)
Copper Mining Company
Mining Properties and Interest 113 Projects
Pima County, Arizona
Progress Reports

Dear Mr. King:

Reference is made to the project reports from the captioned projects.

Kindly instruct the operator to furnish with each progress report, maps or sketches showing formations penetrated and locations and assays of samples taken as well as advances in workings. In the case of the diamond drilling the location and declination of holes in to be shown on maps; logs and assays also are to be submitted.

Sincerely yours,

(signed) FRANK E. JOHNSON

Chairman, Operating Committee

Concurred: J. H. Hedges (DHB)
Member, Bureau of Mines

D. M. Lammon (DHB)
Member, Geological Survey

FEKnouse/jem
8/4/52
cc to: Adm. Reading File
Docket 269A
Docket 269B
Messrs. CHJohnson-3621
Ned Nelson-4216 GSA
Ellis Knouse
Opr. Committee
Field Team, Region IV

8-7-52

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION
WASHINGTON 25, D. C.

224 New Customhouse
Denver 2, Colorado

July 28, 1952

Mr. E. S. Bowman, President
Banner Mining Company
2042 Conner Stravenue
Tucson, Arizona

Re: DMA Docket 269X-A
Contract I-DMA-E32

Dear Mr. Bowman:

Consistent with authority delegated the Executive Officer, DMEA Field Team, Region IV, we hereby waive the requirement for you to provide documentary support of Form MF-104 (Revised-April 1952) Operator's Monthly Report and Voucher, beginning with the month of July, 1952, or the first monthly report using the revised forms, MF-104 and MF-104A, except for support of equipment purchases for which the individual costs exceed $50.00 as explained on the reverse side of Form MF-104 (Revised).

In lieu of documentary support of the monthly voucher, an auditor from the Contract Administration and Audit Division will make interim audits of your books, and will make a final audit on completion or termination of the contract, before the final voucher is processed for reimbursement.

This waiver does not forego the requirement for a concise but complete narrative that must accompany the original and each copy of the Monthly Report.

Very truly yours,

W. H. King
Executive Officer
Field Team, Region IV

AUG 1 1952

WLD:jp
cc: Oper Committee (2)
Fiscal Off, Reg IV
THBrading
WRStorms
JWTownsend
Contract
Chron
MHKoschmann (2)
Chief, Contract Adm. & Audit Div.

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION
WASHINGTON 25, D. C.

224 New Customhouse
Denver 2, Colorado

April 11, 1952

Memorandum

To: C. O. Mittendorf, Acting Administrator
Defense Minerals Exploration Administration

From: Executive Officer, Field Team, Region IV

Subject: Amendment to Contract I-DMA-E32, Docket DMA 269X-A, Banner Mining Company

Enclosed are the original and two copies of an amendment to Contract I-DMA-E32. Copies of this amendment have been given to the operator, the Fiscal Officer, Region IV, and a copy has been retained for our files.

J. H. East, Jr.

J. H. East, Jr.

Enclosures

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
APR 14 1952

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION
WASHINGTON 25, D. C.

224 New Customhouse
Denver 2, Colorado

March 11, 1952

Memorandum

To: C. O. Mittendorf, Acting Administrator
Defense Minerals Exploration Administration

From: Executive Officer, Field Team, Region IV

Subject: Amendment to Contract I-DMA-E32, Docket DMA 269XA, Banner Mining Company

Enclosed are the original and two copies of each of two amendments to Contract I-DMA-E32. Copies of these amendments have been given to the operator, the Fiscal Officer, Region IV, and copies have been retained for our files.

J. H. East, Jr.

J. H. East, Jr.

Enclosures

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
MAR 14 1952

FILE COPY
SURNAME:

410

F L Knouse
Mittendorf

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION
WASHINGTON 25, D. C.

November 28, 1951

Memorandum

To: Reports and Records Section

From: Acting Administrator

Subject: Docket No. DMA 269X-A
Banner Mining Company
Exploration Project Contract I-DMA-E32

Enclosed is an original of a letter dated November 21, 1951 from Mr. J. H. East, Jr., Executive Officer, Region IV, transmitting an amendment, which is also enclosed, to the captioned Exploration Contract. Please attach the amendment to your copy of the contract.

C. O. Mittendorf (for)
cc
11/30

Enclosures

FLKnouse/meb

cc to: Adm.Reading File
Reports and Records
Mr. Mittendorf
FLKnouse
Docket

OFFICE OF THE ADMINISTRATOR

Mr. Krow

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION
WASHINGTON 25, D. C.

DEPARTMENT OF THE INTERIOR
RECEIVED
NOV 26 1951
Defense Minerals Administration,
Production Expansion Division.

224 New Customhouse
Denver 2, Colorado

November 21, 1951

Memorandum

To: C. O. Mittendorf, Director, Production Expansion Division
Defense Minerals Administration

From: Executive Officer, DMA Field Team, Region IV

Subject: Amendment to Contract I-DMA-E32, DMA Docket 269X-A, Banner Mining Company

Enclosed is your signed original and two copies of an amendment to the above contract.

Copies of this amendment have been sent to the operator and to the Fiscal Officer, Region IV. One copy has been retained for DMA files.

J. H. East, Jr.

J. H. East, Jr.

Enclosures

DEFENSE MINERALS ADMINISTRATION WASHINGTON, D.C.
Nov 26 9 13 AM '51

a.e.e.

My dear Senator McFarland:

I am pleased to report to you that the Defense Minerals Administration of this Department has recently entered into contracts with Joe [illegible] Associates and the [illegible] Mining Company operating in your state for the exploration of possible sources of strategic metals and minerals.

These contracts provide that the Government will participate in the expenses of this work in accordance with assistance provided under Section 303 of the Defense Production Act.

The Defense Minerals Administration will be glad to furnish you any further details you may desire in this regard.

Sincerely yours,

Secretary of the Interior

Hon. Ernest W. McFarland
United States Senate
Washington 25, D. C.

J.Feiss:mme
Prep. 7-5-51

Copy to: Secretary's Reading File
Administrator
Mr. Strobel (2)
Files

FILE COPY
SURNAME:

Lit
Mittendorf

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION
WASHINGTON 25, D. C.

June 29, 1951

Mr. J. H. East, Jr.,
Executive Officer
DMA Field Team, Region IV
224 New Customhouse Building
Denver 2, Colorado

Re: Docket No. DMA - 269 XA
Exploration Contract

Dear Mr. East:

We are enclosing three signed and approved copies of Exploration Contract Docket DMA No. 269 XA, Banner Mining Company, 2042 Conner Stravenue, Tucson, Arizona, together with a memorandum dated June 28, 1951 written by Mr. F. L. Knouse to Mr. C. O. Mittendorf.

Please transmit one copy of the contract to the applicant and have the engineering field team verify the beginning points of each sub-project contained in this contract.

Sincerely yours,

C. O. Mittendorf, Director
Production Expansion Division

Enclosures

FLKnouse/bih

cc to: Messrs. Mittendorf-Olund
Strobel
Gowen
Lyons
Knouse
FILES

DMA 269

FILE COPY
SURNAME:

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION
WASHINGTON 25, D. C.

June 28, 1951

Memorandum

TO: Mr. C. O. Mittendorf, Director
Production Expansion Div. - DMA

FROM: F. L. Knouse
Mining Engineer

SUBJECT: Docket No. DMA-269-X-A
Commodity: Copper
Recommended for Exploration
Applicant: Banner Mining Company
2042 Comner Stravenue
Tucson, Arizona
Mine: Mineral Hill--Pima Mining District
Pima County, Arizona

Summary and Recommended Participation by DMA

Total cost of project applied for	$131,300
Total cost of project recommended	126,786
1/Equipment purchased	8,656
Rehabilitating mine; cleaning out and retimbering to make accessable for examination shafts, drifts, crosscuts, raises, sampling and assaying, insurance, etc.	77,500
Drifting, crosscutting and diamond drilling	16,800
Installing facilities, hoists, head frames, compressors, power, hoist house, change room, etc.	23,830
Participation, DMA Funds	63,393

1/Includes one Eimco Mucking Machine, 300 amp. arc welder, 2000' 3/4" steel hoisting cable, electric saw, 20 HP blower, chain hoist, two 3" - 3½" pneumatic drills, one typewriter and one calculating machine.

Discussion

Management

The applicant has operated the Bonney and Miser's Mines at

Lordsburg, New Mexico, together with a 500 ton flotation mill since 1935, during which time it has proven its competancy by a continuous record of profitable operation. The applicant has a long term lease on the Mineral Hill Mine, which was operated by the Barnsdall Mining Company for the period 1915 to 1921.

Mine

The Mineral Hill Mine when operated by the Barnsdall Mining Company reports about 500,000 tons of 3-4% Copper were developed. A later report by Dr. Harrison Schmitt (dated July, 1950) estimated 225,000 tons of 3.4% Copper based on old assay maps. During the period (July 1915 to June 1917) 43,631 tons of ore were shipped containing 3.80% Copper and 0.77 ounces of Silver/ton. There is considerable doubt regarding the existence of the reported ore in this mine, as it is difficult to believe mineral deposits of the reported size and grade would remain intact during World War II when high metal prices would have caused the deposit to be exploited.

Old reports and maps indicate three claims (Banes, Copper Hill, and Milton) have been explored by one 700 foot (incline) one 500 foot (vertical) and one shaft having shallower workings (depth question). Map indicates the 500 foot and 700 foot shafts are connected on the 500 foot level. Applicant proposes to unwater and repair the 700 foot incline shaft and make the shaft safe for an underground examination of the 5, 6, and 7 levels to verify the existence of the reported ore, also to make an underground geological study to determine the advisability of a further exploration work. Any ore found by this examination will be subject to repaying the Exploration Loan. If and when the inclined shaft has been dewatered, and the 500 foot connected vertical shaft has not been dewatered - if then the state mine inspector will not permit the applicant to proceed with the examination and additional exploration work (because of access and ventilation problems), the applicant will then reopen and repair the 500 foot vertical shaft to make it accessable to the extent that it will meet the state mining regulations.

After the underground workings are made accessable, it is proposed to make the access drifts, crosscuts, and raises safe (as are indicated on the attached maps) for sampling of the indicated mineralized bodies, and map the underground geology. If after the sampling and geological mapping program is completed, it is deemed advisable by the Government

engineer to proceed with the additional crosscutting, drifting, and diamond drilling program as outlined on the maps attached to the contract, this program is to be completed. It is possible, because of the lack of definite knowledge of the underground geology, and mineralization, a part of the additional exploration program may require modification. Any modification should meet with the approval of the Government engineers.

In addition to the underground work, equipment required to do this work is to be purchased, and some equipment rented from the applicant and installed as well as surface facilities repaired and constructed.

The applicant verbally reports he has investigated the levels above the water level (235' Elevation) and the indicated mineralized bodies (on maps) of the workings above this level have been mined; also old maps indicate the mineralized bodies above the 300 level have been mined. There is no record that a 400 foot level exists. Assay maps indicate that the mineralized bodies are relatively small in size and have rather spotty values. Old reports from the operating company indicate the ore is soft and requires timbering. All the assay maps that indicate probable economic mineralization is located on the 5th and 6th levels and verbal reports indicate mineralization on the 7th level. Therefore, a downward drilling program from the surface would require holes with lengths of 500' to 700' to prospect these bodies and the applicant estimates at least 25 holes would be required to indicate the existence of this reported mineralization. Twenty-five diamond drills holes having an average depth of 600 feet, at a cost of $5.00/ft. would cost $75,000. Should this drilling program be completed, it is doubtful if the results would be in any way conclusive because of the spotty nature of the mineralization as well as its soft nature, making it almost impossible to recover representative drill cores. The proposed program would produce definite data and more conclusive information on which future work could be based.

<u>The following summarizes the estimated cost of the proposed Re-opening, Rehabilitation, Sampling Geological study, and additional Exploration program:</u>

(1) Power Installation $ 10,000.00
(Includes Transformer substation)

(2)(a) Repair and make accessible and passable as a ventilation shaft and as a second exit as prescribed by law the 500 foot vestical two compartment shaft @ $30.00/ft. 15,000.00

(3) Repair and retimber to make accessible and unwater, 700 foot vertical depth, incline shaft and install pipe and rails @ $30.00 per foot — $ 27,000.00
(Estimated total depth of this shaft- 900 feet)

(4) Install 45 foot headframe, bins and 75 HP Hoist at incline shaft — 6,300.00

(5)(a) Repair Headframe at vertical shaft and install 20 HP Hoist — 1,500.00

(6) Clean out, retimber if necessary to hold open, the indicated drifts and crosscuts on attached plan map totaling about 3900 feet @ $7.00 per foot together with about 400 feet of raises @$10.00 per. This work is detailed as follows:

<u>500 foot level</u>
1600 feet of drifts and crosscuts @ $7.00 per foot — 11,200.00

<u>600 level</u>
1800 feet of drifts and crosscuts @ $7.00 per foot — 12,600.00

<u>700 level</u>
*500 feet of drifts and crosscuts @ $7.00 per foot — 3,500.00

(7) Diamond Drilling, Drifting and Crosscutting program detailed as follows:

<u>500 level</u>
** 600 feet of flat Diamond Drilling as indicated on attached plan map as holes #1, 2 & 3 to locate the extension of H.W. orebody as exposed on the 600 level and the extension of the faulted segiment of the orebody as found on the west end of the 600 level @ $4.00 per foot — 2,400.00

<u>600 level</u>
** 400 feet of drifting on or near the contact toward ore shoots just north and north east of #3 shaft as indicated on plan map to reach position from which Diamond Drills holes can be drilled @ $27.00 per foot. Drifts 6' X 8' — 10,800.00

**	3 - diamond drill holes #4, 5 & 6 totaling 900 feet from the station reached in drift above to intersect ore shoot at #3 shaft @ $4.00 per foot	3,600.00
(8)	Sampling and assaying	2,100.00
(9)	Geological study (Surveying and mapping)	800.00
(10)	Estimated compensation Insurance, social security & other taxes	5,300.00
	Total	$112,100.00

* Estimated footage on account of no maps being available.

** This work is subject to prior approval of the field engineers of the Government.

Summary of Total Cost including costs of new facilities and machinery and repairs to present facilities.

Cost of work (shown above)	$112,100.00
Hoist House and combination changeroom and shop	5,450.00
Additional equipment	8,656.00
Repairs to existing facilities	580.00
Total cost of Project	$126,786.00

Note -

(a) This vertical shaft is needed mainly for ventilation purposes so if after unwatering the incline shaft, we find that the vertical shaft is open then only such work will be done on the vertical shaft to comply with the mine inspectors regulations.

Conclusions and Recommendations:

1. There is no available criteria on which to base the existence of the reported ore underground (that it has not been mined) therefore this application is recommended for an exploration project.

2. The above exploration program is recommended provided it meets the approval of the Field Engineering Team, and also provided that the Field Engineering Team verified the beginning part of each phase of the programs.

3. Because of the uncertain existence of the reported underground mineralized bodies (as they may have been mined) the reported character of the mineral occurrence (small bodies, spotty values and relatively soft bodies making diamond drilling core recovery uncertain with poor representative results) the program proposed by the applicant is recommended over a diamond drilling program from the surface.

4. Any mineralized bodies found (including the ones indicated on the assay maps) resulting from this program, if mined during the period of this contract is to be subject to the contract provisions of repaying this Exploration Loan.

5. The proposed additional drifting or crosscutting and diamond drilling program must have the prior approval of the Government engineers.

6. This proposed program should be done with a minimum amount of rehabilitation, equipment, construction, etc. to make the workings accessible to complete this program.

F. L. Knouse

FLKnouse/ecl

cc to: Messrs. Kittendorf - Olund
Strobel
Lyon
J. H. East, Jr. Region IV
Field Team
Knouse
F I L E S

FILE COPY
SURNAME:

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION
WASHINGTON 25, D. C.

June 26, 1951

Memorandum

To: Mr. C. O. Mittendorf

From: General Counsel

Subject: Banner Mining Company--proposed exploration contracts (1) Banes, Copper Hill, and Milton Claims, DMA-269-X-A; (2) Copper Glance, Copper Queen, and Copper King Claims, DMA-269-X-B

Reference is made to my two memoranda to you of June 25, in which I indicated that I am unable to give legal approval to the subject contracts.

After discussion with Messrs. Knouse and Olund of your Division and Mr. Lyons of the Supply Division, I have come to a different conclusion; I hereby reverse the decision of June 25; and I hereby give legal approval to both contracts, subject, however, to the addition to "Exhibit 'A'," in each contract, of the following paragraph:

> It is agreed that the entire existing mine and facilities are included in the exploration project, and that the existing mine and facilities and all ore deposits therein shall be subject to the Government's claim for repayment under Article 14 of the contract form regardless of whether any "discovery or development" results from the work carried on under this contract.

In my previous memorandum I pointed out that the regulations (MO-5) state that: "The work shall not go beyond a reasonable delineation and sampling of the ore, and shall not include work prosecuted primarily for mining or preparation for mining." I am now assured by Messrs. Lyon, Knouse, and Olund, that although much of this work will undoubtedly be useful for the mining of ore from the property, if such mining turns out to be feasible, yet none of the work will be more extensive than is necessary to accomplish the unwatering of the mine for the purpose of discovering what ore may be available. Mr. Lyon points out that an operator cannot rely on the reports of his predecessors as to the extent and

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION
WASHINGTON 25, D. C.

224 New Customhouse
Denver, Colorado

June 18, 1951

Memorandum

To: Landon Strobel, Executive Secretary, Defense Minerals Administration

From: Executive Officer, DMA Field Team, Region IV

Subject: DMA Docket 364, Comstock Extension Mining Company
DMA 269, Banner Mining Co., Mineral Hill and Twin Buttes Mines

We are enclosing additional information on the original brochures of the above dockets which has been been received from our Tucson office. The final reports on these applications have been sent to Washington previously.

J. H. East, Jr.

J. H. East, Jr.

Enclosures

6/11/51

To: Production Expansion Division

From: Copper ~~Branch~~ Supply Division

Subject: Banner Mining Company - Exploration Aid
Docket DMA 269XA

Recommended for action.

J. B. Gowen

6/5/51

Defense Minerals Administration 6-9-51

Review of Application for Exploration Assistance

Docket No. DMA 269xA

Commodity Copper

Total Amount 133,850

Govt. Participation 50%

1. Name and Address of Applicant Banner Mining Co. 2042 Conner Stravenue, Tucson, Arizona

2. Location of Property Mineral Hill Mine, Pima Mining District, Pima Co. Arizona.

3. Mineral or metal Copper Is it listed in Section 9 of MO-5? yes

If not, application will be rejected.

4. Geologic probability of discovery—based on data in application (question #16, 17, 18, 20 and 22)*

Mines or Survey reports, etc., do you rate chances:

a) Good yes

b) Poor

c) None

d) Don't know—needs field examination No

e) Is there an alternative and favorable project? No
(If so, attach an explanation)

5. Is the applicant's right to the property clearly stated? yes
(question 5, 6, 7)*

6. If applicant is a lessee, is a copy of the lease attached? yes

Does the lease have sufficient time to run to cover a future productive period? yes

*question numbers are those of MF-103

7. Are subordination agreements necessary? Yes

a) MF-201? No

b) MF-202 Yes

8. From the data presented, does the proposed project appear feasible from the point of view of:

a) Available manpower Yes

b) Equipment and supplies Yes
(Question 14 plus general knowledge of availability)*

c) Accessibility (question 12)* Yes

d) Water (question 13)* Yes - no problem -

e) Power (question 13)* available

Is a field check needed on any of these points? no

9. Does the experience of the applicant appear to be adequate to assure that he can properly conduct the proposed project? (question 4)* Yes

Is a field check needed on this point? no

10. Exhibit A. (questions 21 and 22)*

a) Is the project adequately described? Yes

If not, are there sufficient data given so that you can describe the project? _____ If so, attach a draft.

b) Is there an adequate map or sketch of the proposed work? Yes

c) Is the proposed work "exploration" under the definition of Section 8, MO-5? Yes

If not, what part of it is? _____

Is this part a worthwhile exploration project? Yes

d) Are the cost estimates detailed? Yes

Can they be summarized, as on page 2 of Procedural Instruction 5-A, from the available data? Yes If so, attach a draft.

e) Are the cost estimates reasonable? Yes

f) Should more information be requested from applicant? No

g) Is a field examination necessary to complete Exhibit A? No

11. Exhibit B (question 23-d)*

a) Is it applicable? Yes

b) If so, are sufficient data furnished? Yes. If so, attach a draft.

c) Is a field check needed? No

12. Exhibit C (question 23-e, f and g)*

a) Is it applicable? Yes

b) Sufficient data? Yes If so, attach a draft.

c) Are rents and charges reasonable? Yes

d) Is a field check needed? No

13. Exhibit D (question 23-a, b)*

a) Are there sufficient data? Yes

b) Is the schedule adequate for the work proposed? Yes as far as now known

c) Is the schedule excessive for the work proposed? No

d) Are the proposed wages and salaries reasonable? Yes

e) Is a field check needed? No

14. Exhibit E (question 23-c)*

a) Is it applicable? Yes

b) Sufficient data? Yes

c) Reasonable? Yes

d) Field check needed? No

15. In your judgment, can the proposed work be done in the proposed time? Yes

(All exploration must be completed within two years)

16. If field examination is not needed, attach your recommendation.

17. If field examination is needed, do you have any special instructions for the field team not indicated by your answers to the foregoing question? Project has been examined by Field Team who recommend approval of project.
The Copper Branch, concurs with that recommendation

Reviewed by: J B Gowen 4/9/51
C F Wilson
D M Zachaven

Date

97692

CLASS OF SERVICE

This is a full-rate Telegram or Cablegram unless its deferred character is indicated by a suitable symbol above or preceding the address.

WESTERN UNION

1201

W. P. MARSHALL, PRESIDENT

(40).

Mr Strobel

Gowen

SYMBOLS
DL=Day Letter
NL=Night Letter
LT=Int'l Letter Telegram
VLT=Int'l Victory Ltr.

The filing time shown in the date line on telegrams and day letters is STANDARD TIME at point of origin. Time of receipt is STANDARD TIME at point of destination

1951 JUN 7 PM 1 42

.WP097 PD=LORDSBURG NMEX 7 1122A=

.DR JAMES BOYD, DIR=

DEFENSE MINERALS ADMN INTERIOR BLDG=

PLEASE ADVISE BY WESTERN UNION DISPOSITION OF DMA DOCKET #269 ON OUR MINERAL HILL AND TWIN BUTTES MINES NEAR TUCSON ARIZ=

.BANNER MINING CO=

THE COMPANY WILL APPRECIATE SUGGESTIONS FROM ITS PATRONS CONCERNING ITS SERVICE

BUREAU OF MINES
MAIL ROOM
WASHINGTON, D. C.
JUN 7 2 45 PM '51

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
JUN 7 1951
3:55 P.M.
LANDON F. STROBEL
Executive Secretary

J B Goodman
3134

Memorandum

To. Mr. C.O. Muttendorf

From: F.L. Knouse

Subject: Docket D.M.A. 269-X-A
Commodity - Copper.

Contract Applied For - Exploration Loan - Amount $133,850

Applicant: Banner Mining Company.
2042 Conner Stravenue, Tucson, Arizona

Mine - Mineral Hill Mine, Pima Mining District
Pima County, Arizona.

Conclusions: Application Denied; Application should be made for a development loan.

Applicant's Proposal:

Applicant proposes to reopen Got Hermination the Mineral Hill Mine (operated by the Bornsdall Mining Company 1917 through 1930) and explore and rehabilitate the copper work reported developed by this company.

The proposed work outlined in this program consists of cleaning out, dewatering and retimbering a 700 foot incline shaft located on the Banes claim, and cleaning out, dewatering and retimbering of a 500 foot vertical shaft located on the Copper Hill claim, as well as the cleaning out and retimbering of the connecting crosscuts, drifts, raises, etc.

This work should not be undertaken prior to production on a loan further explorations if it is to be deemed advisable.

The work required by this re-opening phase of this mine consists of the following:

1. Excavating for hoist, hoist house, and headframe at incline shaft
2. Install Hoist, headframe, bins and Hoist House.
3. Bringing in Electric Power.
4. Re-timbering, repairing and unwatering the 700 foot incline shaft and the 500 foot Vertical shaft.
5. Re-opening, re-timbering if necessary the bottom three levels and installing pipe and track.
6. Build warehouse, office, change room, and shop buildings.

The applicant has some equipment at their Lordsburg New Mexico property which they plan to use on this program. Some of this equipment is now being used.

The water level in the mine is reported 235 feet below the collar of the Vertical shaft. Operating mine records 1920 show the mine makes about 250 G.P.M.

Records of the Barnsdall Mining Company indicate they blocked out about 500 000 tons of 3 to 4% copper ore. 46,631 tons of ore were reported shipped from this mine during the period July 1915 to June 1917 which averaged 3.8% copper and 0.77 ounces of Silver per ton. The net smelter returns on these shipments totaled $433,913.00

A geological report by Dr. Harrison Schmitt estimates from old company maps 225,000 tons are available which will average 3.4% copper.

Applicant expects to begin producing at the rate of 300 tons/day of 2½ to 6% copper ore within 1½ years after this proposed program is started. Some production is planned to start during February 1952

Summary of Estimated Costs of Proposed Program.

Power Installations	10,000 —
Repair and retimber 500 foot Vertical Shaft	20,000 —
Repair, retimber, and unwater 700 foot Incline Shaft.	25,000 —
Excavating for, and installing of Hoist at Incline Shaft	7,500 —
Headframe and Cribs at incline Shaft	6,300 —
Repair Headframe at Vertical Shaft and Install Hoist	1,500 —
Re-open and retimber the three lower levels and raises	28,000 —
Surface buildings (Shop, warehouse, changeroom, Hoist Houses, and office)	25,000 —
Equipment rented and Purchases	6,050 —
Compensation Insurance, Social Security and other taxes	4,500 —
Total	133,850 —

Comments:

An examination of the data presented indicates the proposes

DRAFT-MacLare

DRM

May 31, 1951

Docket No. DMA-269X-A (Mineral Hill)
Copper
Banner Mining Company

Memorandum

To: Director, Production Expansion Division

From: Director Supply Division

Subject: Banner Mining Company, Exploration Project, 50 percent Government Participation.

A. Banner Mining Company, 2042 Comer Stravenue, Tucson, Ariz ~~P.O. Box X, Lordsburg, New Mexico~~

B. Mineral Hill mine is in Pima County, Arizona ~~located~~ 16 miles south of Tucson, and 8 miles west of Sahuarita, ~~Arizona~~.

C. Conclusions:

1. This project is pertinent to the copper program.

2. It is technically feasible.

3. Required materials will probably be available.

4. The company is willing and able to provide 50 percent of costs, which will total $131,300.00. Governments' share to be $65,650.00.

5. The Banner Mining Company is competent.

D. Recommendations:

Financial assistance in the form of a 50 percent participation exploration contract is recommended.

E. Applicant proposes to unwater and rehabilitate the Mineral Hill Mine, to prove the ~~reported~~ existence of 200,000 tons of ore, averaging 3.36 percent copper that is indicated by old mine records, and to make possible further exploration of very favorable areas.

F. This project offers ~~very~~ excellent probabilities of discovering new orebodies that will expand the national reserves.

G. Technical:

1. The Field Team report the known orebodies are of the contact metamorphic type, occurring in limestone along an intrusive granite contact, and along faults intersecting the contact. It is highly probable that additional reserves will be found in unexplored areas along the contact and faults. It is necessary that the present workings be dewatered and rehabilitated before a definite exploration program can be formulated.

2. to 5. Not applicable.

6. Dewatering and rehabilitation should be completed by the end of December.

Exhibit E

H. 1. and 2. Exhibits B and C ~~No detailed lists have been submitted~~. Field Team report that Banner Mining Company has almost all of the equipment required for the rehabilitation program at its shops in Lordsburg, New Mixico.

INSERT (A)

3. Very good gravel road to Sahuarita where it joins the Tucson-Nogales oiled highway.

4. Labor appears to be abundant. Exhibit D

5. Rurual Electorfication Administration has agreed to furnish 300 k.v.a. with transformer banks by about September 1, 1951. Single phase 110 volt will be available within a month.

I. Financing:

1. Government 50 percent aid exploration project

2. Government to provide $65,650.00 appears adequate for this project. Detailed Cost Estimate:

INSERT (B)

3. Not applicable

4. Repayment of advances made by governmental agencies is to be on the basis of provisions set up under the exploration program of the D.M.A. Subordinating agreements signed by leasors have not yet been submitted.

5. Not applicable.

J. Banner Mining Company is a reputable organization with a history of successful operation of copper mines near Lordsburg, New Mexico, and is a thoroughly competent organization.

K. Correspondence submitted in accompanying files:

1. December 12, 1950, A. B. Bowman to J. H. East, Jr. making application for operating loan assistance.

January 19, 1951 S. H. Williston to A. B. Bowman requesting revision of terms.

February 20, 1951, Tom Lyon to A. B. Bowman acknowledging receipt of revision of terms.

March 23, 1951, Tom Lyon to A. B. Bowman acknowledging receipt of letter referring to power supply.

May 23, 1951, W. H. Hardy to Dr. Boyd letter coving submission of Forms MF-100 and MF-103.

2. None

Accompanying this memorandum are applications including exhibits, and report and recommendations of Field Team.

Tom Lyon, Director
Supply Division

Attachments

Copy to: J. H. East, Jr. 224 New Customhouse, Denver 2, Colorado (2)
Executive Secretary
Copper Branch
Mr. Lyon
Mr. MacLaren
Files

~~INSERT~~ (B)

Part of Exhibit A.

Summary of Estimated Cost of Rehabilitation of Mineral Hill Mine

Power installation	$ 10,000.00
Repair and retimber 500 foot vertical shaft	20,000.00
Repair, retimber, unwater 700 foot incline shaft	25,000.00
Excavation for and installation of hoist at incline shaft	7,500.00
Headframe and bins at incline shaft	6,300.00
Repair headframe and install hoist at vertical shaft	1,500.00
Reopen and retimber three lower levels and raises	28,000.00
Surface buildings	25,000.00
Equipment rentals and purchases	3,500.00
Compensation insurance, Social Security and other taxes	4,500.00
Total	$ 131,300.00

INSERT (A)

Mineral Hill

H. 1. Repairs:

1. Repair headframe at vertical shaft $ 750.00

Repair and retimber 500 foot vertical shaft 20,000.00

Repair and retimber and unwater 700 foot incline shaft 25,000.00

Reopen and retimber where necessary three lower levels 28,000.00

Total $ 73,750.00

~~Surface Buildings (Changeroom, warehouse, shop and office)~~ $ ~~25,000.00~~

~~Excavation and build hoist house at incline shaft~~ ~~7,500.00~~

~~Headframe and bins at incline shaft~~ ~~6,300.00~~

~~Hoist installation at vertical shaft~~ ~~750.00~~

~~Total~~ $ ~~39,550.00~~

Owned To be charged as rentals against project:

1 - 75 H.P. Single drum hoist $ 100 per month

1 - 20 H.P. Single drum hoist 50 per month

2 - 50 H.P. IR Centrifugal pumps 130 per month

1 - Concrete mixer - new 50 per month

1 - 15 H.P. Cut off saw 24" 20 per month

The costs of these rentals are included in the Summary of Estimated Costs of Proposed Rehabilitation

2. Construction:

2. Surface buildings (changeroom, warehouse, shop, and office) $ 25,000.00

Excavation and build hoisthouse at inclined shaft 7,500.00

Headframe and bins at incline shaft 6,300.00

Hoist installation at vertical shaft 750.00

~~To~~

INSERT (A)

(H. 2. (cont'd)

To be purchased:

Arc welder and accessories	$ 640.00
1 - 1,075 foot hoist cable 3/4 inch for incline shaft	375.00
1 - 750 foot hoist cable 3/4 inch for vertical shaft	360.00
1 - Electric saw for framing	175.00
1 - Blower for lower levels of inclined shaft	600.00
1 - Typewriter	170.00
1 - adding machine	230.00
Total	$ 2,550.00

To be rented:

1 - Gardner-Denver 445 cubic foot per minute Compressor	1,050.00

3. Very good gravel road to Sahuarita, where it joins the Tucson - Nogales oiled highway.

4. Labor appears to be sufficient for estimated requirements.

6 shaftmen at $ 1.59½ per hour
1 hoistman at 1.49½ per hour
1 carpenter at 1.61½ per hour
2 helpers at 1.36½ per hour
1 Mechanic at 1.61½ per hour
1 Warehouseman at 1.25 per hour. This man will be a combination warehouseman, timekeeper and clerk.

Estimated total cost of labor $ 42,000.00

1 General Superintendent (½ time) at $ 361.00
1 General Foreman (½ time) at 255.00
1 Engineer (½ time) at 200.00

Estimated total cost of Supervision and Engineering (½ time) $ 5,100.00

Balance of time is charged to Twin Buttes.

BANNER MINING COMPANY

LONG DISTANCE 459 TELEPHONE 7-8614
1910 1ST NATIONAL BLDG. OKLAHOMA CITY, OKLA.
H. I. GRIMES ○ PRESIDENT

May 23,1951

Dr. James Boyd
Defense Minerals Administration
Interior Building
Washington 25, D. C.

Dear Sir:

We enclose in quadruplicate

(1) U. S. Department of Interior, Defense Minerals Administration Form MF-100 covering our Mineral Hill Mine, Pima County Arizona.

DMA 269A-X (2) Form MF-103 covering our Mineral Hill Mine, Pima County Arizona.

(3) Form MF-100 covering our Twin Buttes Mine, Pima County Arizona.

DMA 269B-X (4) Form MF-103 covering our Twin Buttes Mine, Pima County Arizona.

All of the above is being forwarded to you by air parcel post and we trust that you receive same promptly.

Thanking you for your attention, we remain

Very truly yours,

BANNER MINING COMPANY

By W. H. Hardy
W. H. Hardy, Treas.

WHH/br

cc. A. B. Bowman
2042 Conner Stravenue
Tucson, Ariz.

cc. E. S. Bowman
P. O. Box X
Lordsburg, N. M.

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
WASH D
MAY 26 1951
LOUIS F. SMOOTS
Executive Secretary

FILE COPY
SURNAME:

Bowen
Mechaven

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION
WASHINGTON 25, D. C.

May 17, 1951

Memorandum

To: Director, Production Expansion Division

From: Supply Division

Subject: Banner Mining Company, Exploration Project, 50 percent Government Participation (DMA-269)

A. Banner Mining Company, P. O. Box X, Lordsburg, New Mexico.

B. Properties are 16 miles and 25 miles Southwest of Tucson, Arizona.

C. Conclusion:

1. This project is pertinent to the copper program.
2. The Field Team report it is technically feasible.
3. Required material will probably be available.
4. The Company is willing and able to provide 50 percent of costs.
5. The Banner Mining Company is competent.

D. Recommendations:

Financial assistance in the form of a 50 percent participation exploration contract is recommended.

E. Applicant proposes to unwater and rehabilitate the Mineral Hill and Twin Buttes Mines, to mine 200,000 tons of ore, averaging 3.36 percent copper that is indicated by mine records as being blocked out, and to make possible further exploration of very favorable areas.

F. This project offers excellent probabilities of discovering new orebodies that will expand the national reserves.

G. Technical:

1. The Field Team report the known orebodies are of the contact metamorphic type, occurring in limestone along an intrusive granite contact and along faults intersecting the contact. It is highly probable that additional reserves will be found in unexplored areas along the contact. It is necessary that the present workings be dewatered and rehabilitated before a definite exploration program can be formulated.
2. to 5. not applicable.
6. Dewatering and rehabilitation should be completed by October or November 1951.

H. 1. No detailed lists have been submitted. Field Team reports that Banner Mining Company has almost all of the equipment required for the rehabilitation program at its shops in Lordsburg, New Mexico.
2. Same as above.
3. Very good gravel road to Sahuarito where it joins Tucson-Nogales oiled highway.
4. Labor appears abundant.
5. Rural Electrification Administration has agreed to furnish 300 K.V.A. with transformer banks by about September 1, 1951. Single phase 110 volt will be available within a month.

I. Financing:

1. Government 50 percent aid exploration project.
2. Government to provide $[illegible],500 appears adequate for project.
3. Not applicable.
4. Repayment of advances made by governmental agencies is to be on the basis of provisions set up under the exploration program of the DMA.
5. Not applicable.

J. Banner Mining Company is a reputable organization with a history of successful operation of copper mines near Lordsburg, New Mexico, and is a thoroughly competent organization.

K. Correspondence submitted in accompanying file:

1. December 12, 1950, A. H. Bowman to J. H. East, Jr. making application.
January 19, 1951, S. H. Williston to A. H. Bowman

requesting revision of terms.
February 20, 1951, Tom Lyon to A. B. Bowman acknowledging receipt of revision of terms.
March 23, 1951, Tom Lyon to A. B. Bowman acknowledging receipt of letter referring to power supply.

2. None.

Accompanying this memorandum are application including exhibits, and report and recommendations of the Field Team.

Tom Lyon, Director
Supply Division

Attachments

DRMacLaren:pf

Copy to: J. H. East, Jr., 224 New Customhouse, Denver 2, Colorado
Executive Secretary
Copper Branch
Mr. Lyon
Mr. MacLaren
Files

17

FILE COPY
SURNAME:

Johnson

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION
WASHINGTON 25, D. C.

March 23, 1951

Re: Docket No. 269

Mr. A. B. Bowman, Superintendent
Banner Mining Company
2042 Conner Stravenue
Tucson, Arizona

Dear Mr. Bowman:

This is to acknowledge receipt of your letter of March 17, 1951 with reference to the power supply for your Mineral Hill and Twin Buttes project near Tucson, Arizona.

I am very glad that your negotiation with the Trico Electric Company appears to have worked out to the advantage of these proposed projects. Copies of the letter are being appended to your application and a copy will be sent to the field team for its information.

Thank you for keeping us advised.

Very truly yours,

Tom Lyon

Tom Lyon, Chief
Copper Branch

CHJohnson:pf

Copy to: Executive Officer, DMA Field Team, Region IV,
224 New Customhouse, Denver 2, Colorado w.c.i.
Executive Secretary w.c.i.
Copper Commodity Committee w.c.i.
√Files

Ariz - 269

856

LANDON F. SPROUL

Mr. Lyon

BANNER MINING COMPANY

POST OFFICE BOX-X

LORDSBURG, NEW MEXICO

ADDRESS REPLY TO
ALLAN B. BOWMAN
SUPERINTENDENT
LORDSBURG MINES
BOX-X LORDSBURG, N. M.

March 17, 1951

HOME OFFICE
1910 FIRST NAT'L BLDG.
OKLAHOMA CITY, OKLA.

MAR 20 8 35 AM '51
BUREAU OF MINES
WASHINGTON, D.C.

MAR 20 1951

Mr. Tom Lyon, Chief
Copper Branch
Defense Minerals Administration
Washington, D. C.

answered 3-23-51 CHS

Dear Mr. Lyon:-

Please refer to our application on the Mineral Hill and Twin Buttes mines near Tucson, Arizona. This application has been given a DMA docket number of 269.

We have been able to make a large saving in the cost of obtaining power for this project. While in Washington we negotiated with the R. E. A. for the necessary power through their outlet in Tucson, The Trico Electric Company. They have agreed to furnish 300 KVA at each of the following outlets together with the necessary transformer stations: Mineral Hill mine, Copper Glance Mine and the Copper Queen Mine.

The cost to us for each installation has been set up as follows:- (1) Mineral Hill mine-deposit on account of cost of facilities-$9700.00, (2) Copper Glance mine-deposit $1765.00, (3) Copper Queen Mine-deposit $1765.00. These deposits will be returned to us in the form of a credit of 20% on each monthly bill for services. This is about one fifth of the cost to us as proposed by the Tucson Gas and Electric Company, whose proposal was used in our application on these mines.

The rates under the proposed five year contract for each mine are as follows:- $225.00 minimum monthly charge. $1.75 per month per KW of billing demand. 2.0¢ per KWH for the first 50 KWH , 1.5¢ per KWH for the next 100KWH, 0.8¢ per KWH for all remaining KWH used per month.

Will you please make this letter a part of our application on the above named mines. It will reduce the cost over the original estimate by about $60,000.00.

Yours very truly

BANNER MINING COMPANY

A. B. Bowman

A. B. Bowman, Sup't.

FILE COPY
SURNAME:

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION
WASHINGTON 25, D. C.

March 8, 1951

Air Mail

Memorandum

To: Executive Officer, DMA Field Team, Region IV

From: Chairman, Copper Commodity Committee

Through: Operation Committee

Subject: DMA No. 269, Twin Buttes and Mineral Hills Mine, Pima County, Arizona, Banner Mining Company, 2042 Conner Stravenue, Tucson, Arizona

The Commodity Committee has investigated the requested loan of this Company for these mines and has decided to treat this as an exploration project. This has been discussed with the applicant and is agreeable to him. It was agreed also to consider the Mineral Hill and the Twin Buttes as separate projects. Perhaps each should be set up in two steps, first to reopen and examine thoroughly, second to explore for more ore.

To proceed with this matter we are asking you to have an examination made of the company's proposed explorations.

For your convenience we are enclosing all of the information pertaining to this property. Please return this file when you have completed your report.

Tom Lyon, Chairman
Copper Commodity Committee

Enclosure

Approved:

Tom Lyon
Chairman, Operating Committee

Lowell B. Moon
Member, Bureau of Mines

Olaf N. Rove
Member, Geological Survey

Copy to: Executive Secretary
Copper Commodity Committee
Files

FILE COPY
SURNAME:

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION
WASHINGTON 25, D. C.

John Burbank
act
Moan

March 8, 1951

Re: Docket No. DMA-269

Mr. A. B. Bowman, Superintendent
Banner Mining Company
2042 Conner Stravenue
Tucson, Arizona

Dear Mr. Bowman:

Your application for assistance under the Defense Production Act of 1950 on behalf of the Mineral Hill and Twin Buttes mine will be considered as an exploration project. As you know the plan for assistance on exploration projects is to be announced soon.

In accordance with your discussion with us on March 2, we are requesting an investigation by the Defense Minerals Administration Field Team of Region IV. You may expect to hear from Mr. J. H. East, Jr., Executive Officer of the Field Team, with reference to the matter.

Very truly yours,

Tom Lyon, Director
Supply Division

CHJohnson:cw

Copy to: Mr. East, Executive Officer, Field Team, Region IV, Denver, Colorado
Mr. Strobel
Copper Commodity Committee - 3425
Files

February 20, 1951

Mr. A. B. Bowman
Superintendent
Banner Mining Company
Post Office Box-X
Lordsburg, New Mexico

Dear Mr. Bowman:

Your letter to Mr. Williston, dated February 11, has been received and we will consider your application under the new conditions you have set forth.

We have also received your letter of February 11, together with a report by Dr. Harrison Smith. This report will be of great assistance in our consideration of your application.

Very truly yours,

Tom Lyon, Chief
Copper Branch

TLyon/apd

Copper Committee
Executive Secretary
Files

dma 269

BANNER MINING COMPANY

POST OFFICE BOX-X

LORDSBURG, NEW MEXICO

ADDRESS REPLY TO
ALLAN B. BOWMAN
SUPERINTENDENT
LORDSBURG MINES
BOX-X LORDSBURG, N. M.

February 13, 1951

HOME OFFICE
1910 FIRST NAT'L BLDG.
OKLAHOMA CITY, OKLA.

FEB 18 12 31 AM '51
BUREAU OF MINES
WASHINGTON, D.C.

Mr. S. H. Williston
Director, Supply Division
Defense Minerals Administration
Washington 25, D. C.

Re; D. M. A. Docket #269 -- Banner Mining Company-Arizona

Dear Mr. Williston:-

Please refer to my letter of February 11, 1951 regarding our application for aid on behalf of the Mineral Hill and Twin Buttes Mines Southwest of Tucson, Arizona.

I have just received Dr. Harrison Schmitts' report on the Mineral Hill mine and am enclosing a copy of same which is to be made a part of our application on this mine.

I hope you will be able to give our amended application your prompt attention.

Yours very truly

BANNER MINING COMPANY

A. B. Bowman

A. B. Bowman, Sup't.

LANDON F. STROBEL
~~Mr. Lyons~~
Mr. Williston

BANNER MINING COMPANY

POST OFFICE BOX-X
LORDSBURG, NEW MEXICO

February 11, 1951

ADDRESS REPLY TO
ALLAN B. BOWMAN
SUPERINTENDENT
LORDSBURG MINES
BOX-X LORDSBURG, N. M.

HOME OFFICE
1910 FIRST NAT'L BLDG.
OKLAHOMA CITY, OKLA.

FEB 18 7 59 PM '51
BUREAU OF MINES
WASHINGTON, D.C.

Mr. S. H. Williston
Director, Supply Division
Defense Minerals Administration
Washington 25, D. C.

Re: D. M. A. Docket #269 Banner Mining Company- Arizona

Dear Mr. Williston:-

1-19-51

I have just received your letter regarding our application for assistance under the Defense Production Act of 1950 for the Mineral Hill and Twin Buttes mines. These mines are located ~~Southwest of Tucson~~, Arizona.

In our application on these mines, I was anticipating the inevitable higher future costs in figuring the amount of aid necessary. It was our experience during World War 11 that if we waited until higher costs were upon us before asking for aid, that generally costs had gone much higher than the application called for before action could be taken by the government agency involved. As a result we generally came out on the small end.

The escalated floor price you mention in your letter will no doubt take care of this condition of higher future costs.

I have consulted with the officials of our company and we are all willing to proceed with the project as set forth in our application but amending the part asking for above market prices to read "at market prices" provided that the escalated floor price clause to cover possible future cost increases is inserted.

The labor supply at the mines is good at present and I am sure we can get this project in motion in a very short time. I have taken options on buildings, pumps and other necessary machinery since making our application and have already saved some money over present costs. I wish to call to

attention the fact that the power company here in Tucson have advised me that they have the necessary supplies and equipment to build these lines and sub-stations at present. How long this situation will exist is problematical. I feel that it would be wise to tie up this source of power just as soon as we are certain the project will be approved so as to insure a good power source.

We have had Dr. Harrison Schmitt of Silver City, New Mexico make an examination and a report on the Mineral Hill Mine in support of our application for aid and I will forward it to you just as soon as it is received. I can say at present that he was favorably impressed and will give a favorable report.

We have operated at Lordsburg, New Mexico for over 15 years on ores that will average 3% or less so we feel we are well equipped to handle the problems involved in operating low grade copper mines and mills.

I trust that this amended application will receive your early approval as I am certain that an early start will help us to hold costs within limits of the application.

Please send any future correspondence on this subject to me at 2042 Conner Stravenue, Tucson, Arizona.

If there is any further information you require please advise.

Yours very truly

BANNER MINING COMPANY

A. B. Bowman

A. B. Bowman, Sup't.

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION
WASHINGTON 25, D. C.

January 19, 1951

Re: Docket No. DMA-269
Banner Mining Co.
New Mexico.

rec'd by P.E.D on Jan. 31, 1951 HEO

Memorandum

To: Operating Committee, DMA

From: Copper Commodity Committee

Subject: Application on Twin Buttes and Mineral Hill near Tucson, Arizona.

The critical feature of this application is the request for a premium price of six cents a pound on all copper produced. Since we have not yet had to negotiate over-the-market contracts it is recommended that this particular feature be rejected.

However, the property has considerable merit as a DMA project and it is hoped that the applicant can and will revise his terms. A proposed letter to the applicant is attached.

J. K. Richardson, Chairman
Copper Commodity Committee, DMA

Attachment

For Approval:

Acting Chairman, Operating Committee

O. N. Rove

J. H. Hedges

FILE COPY
SURNAME:

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION
WASHINGTON 25, D. C.

Richardson

January 19, 1951

Re: DMA - 269
Tanner Mining Co.,
Arizona

Mr. A. R. Bowman
Superintendent, Lordsburg Mines
Tanner Mining Company
P. O. Box - X
Lordsburg, New Mexico

Dear Mr. Bowman:

Your application for assistance under the Defense Production Act of 1950 on behalf of the Mineral Hill and Twin Butte mines, southwest of Tucson, Arizona, has been assigned the docket number above and has been considered by the Copper Branch.

First, we wish to compliment you on a well-prepared application which appears to offer a very worthwhile project.

One feature of your present application which would slow down consideration of it is your request for above market price. We are still working on assistance applications that only require market prices. Later we will be forced to consider others.

Is there any possibility of your proposing other terms that would eliminate this feature? Many substantial applications have been received on the basis of market quotations (currently 24½ cents) with an escalated floor price which would cover possible future cost increases.

We will be very much interested to hear from you further.

Sincerely yours,

S. H. WILLISTON

S. H. Williston
Director, Supply Division

JKRichardson:apd

Cc - Mr. East, Ex. Off., Field Team IV
Mr. Strobel - 4623
Copper Commodity Committee - 3425
Files

14

DEFENSE MINERALS ADMINISTRATION

Mr. Richardson

Referral of Applications for Government Aid

Docket No. DMA - 269

Commodity: copper

Name of Applicant: Banner Mining Company
(A. B. Bowman, superintendent)

Address of Applicant: Post Office Box-X
Lordsburg, New Mexico

Name of Property: Mineral Hill, Plumed Knight, Copper Glance, Copper Queen, Copper King, Morgan, Minnie, Copper Bullion

Location of Property: Pima County, Arizona

Nature of Application: Loan for reopening, development and exploration projects

Action Dates

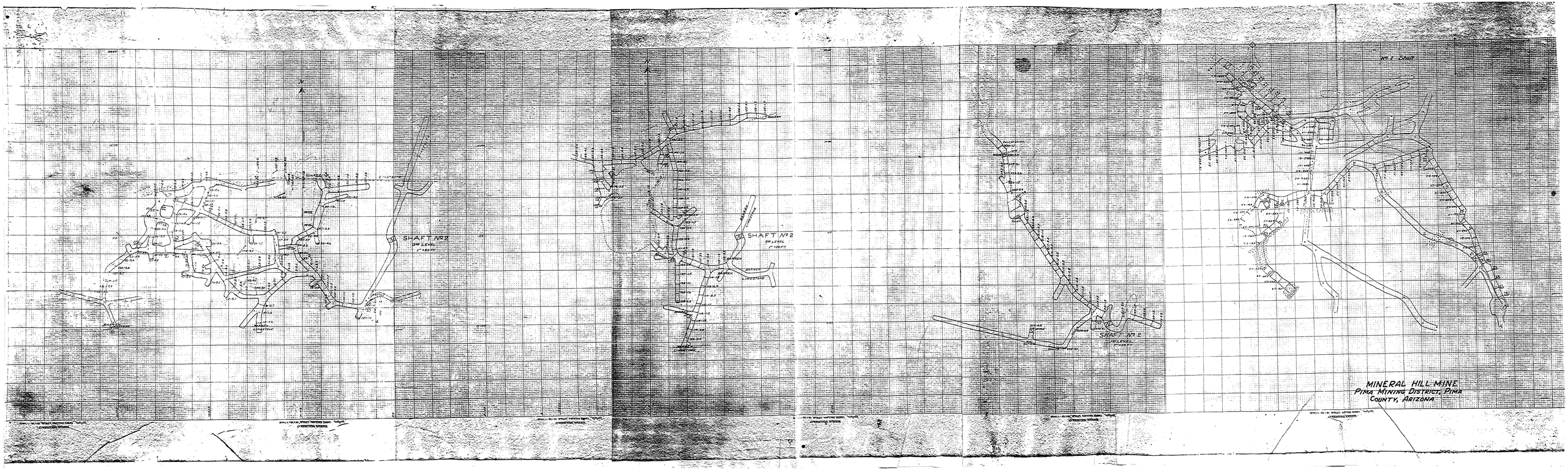
Application: 12/15/50

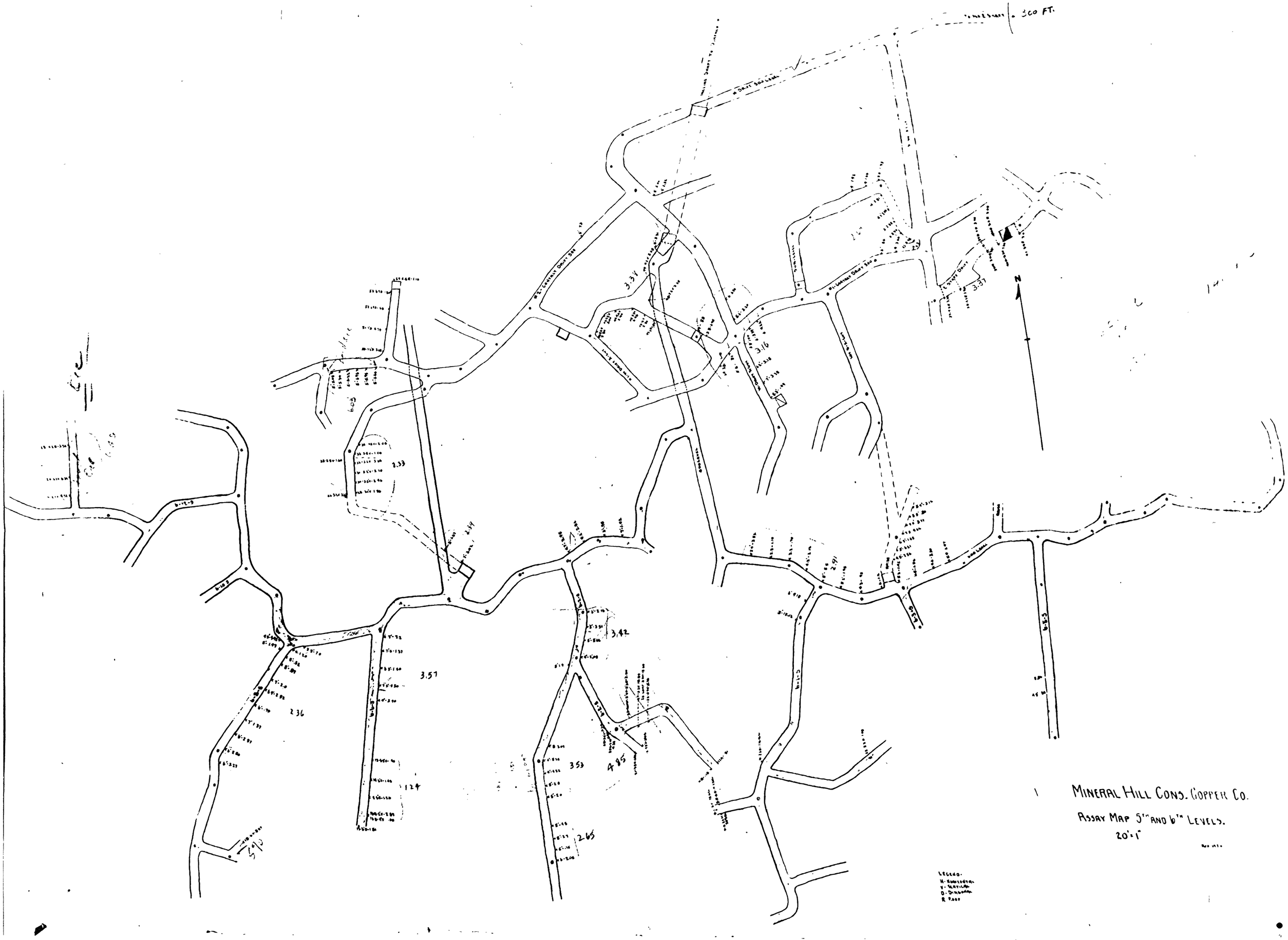
Received: 12/29/50

Acknowledged:

Referred to NONFERROUS METALS Committee: 1/5/51

DN


SHAFT No 2
3rd LEVEL
1" = 100 FT.
SHAFT No 2
4th LEVEL
1" = 100 FT.
SHAFT No 2
1st LEVEL
1" = 100 FT.
No 1 Shaft
MINERAL HILL MINE
PIMA MINING DISTRICT, PIMA
COUNTY, ARIZONA


300 FT.
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3.31
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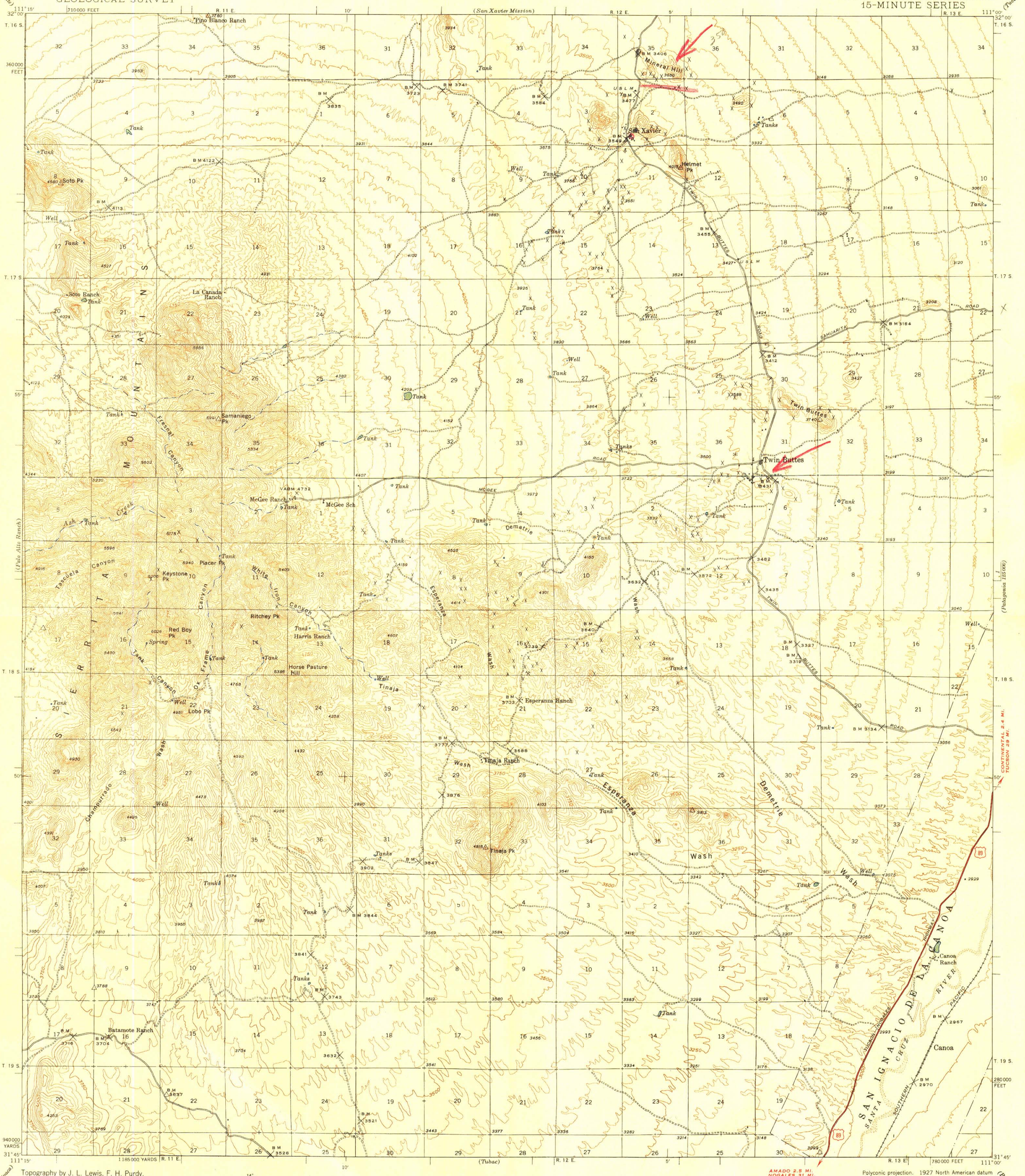
MINERAL HILL CONS. COPPER CO.
ASSAY MAP 5TH AND 6TH LEVELS.
20'=1"

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

ARIZONA
(PIMA COUNTY)
TWIN BUTTES QUADRANGLE
15-MINUTE SERIES



Topography by J. L. Lewis, F. H. Purdy, J. J. Hayes, S. M. Borrell, K. A. Bunker, P. J. Frampton, and G. B. Woolley
Surveyed in 1938–1939

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U. S. Route State Route

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APPROXIMATE MEAN DECLINATION, 1939

SCALE 1:62500

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Contour interval 50 feet
Datum is mean sea level

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5000 yard grid based on U. S. zone system, F
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rectangular coordinate system

TWIN BUTTES, ARIZ.
Edition of 1948

N3145—W11100/15

43

THE TOPOGRAPHIC MAPS OF THE UNITED STATES

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Although some areas are surveyed and some maps are compiled and published on special scales for special purposes, the standard topographic surveys and the resulting maps have for many years been of three types, differentiated as follows:

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The aerial camera is now being used in mapping. From the information recorded on the photographs, planimetric maps, which show only drainage and culture, have been made for some areas in the United States. By the use of stereoscopic plotting apparatus, aerial photographs are utilized also in the making of the regular topographic maps, which show relief as well as drainage and culture.

A topographic survey of Alaska has been in progress since 1898, and nearly 44 percent of its area has now been mapped. About 15 percent of the Territory has been covered by maps on a scale of $\frac{1}{500,000}$ (1 inch = nearly 8 miles). For most of the remainder of the area surveyed the maps published are on a scale of $\frac{1}{250,000}$ (1 inch = nearly 4 miles). For some areas of particular economic importance, covering about 4,300 square miles, the maps published are on a scale of $\frac{1}{62,500}$ (1 inch = nearly 1 mile) or larger. In addition to the area covered by topographic maps, about 11,300 square miles of southeastern Alaska has been covered by planimetric maps on scales of $\frac{1}{125,000}$ and $\frac{1}{250,000}$.

The Hawaiian Islands have been surveyed, and the resulting maps are published on a scale of $\frac{1}{62,500}$.

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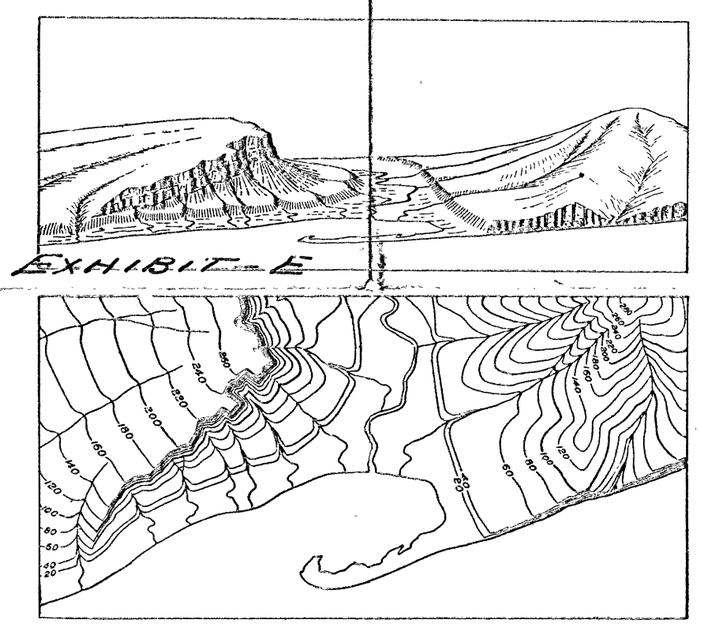

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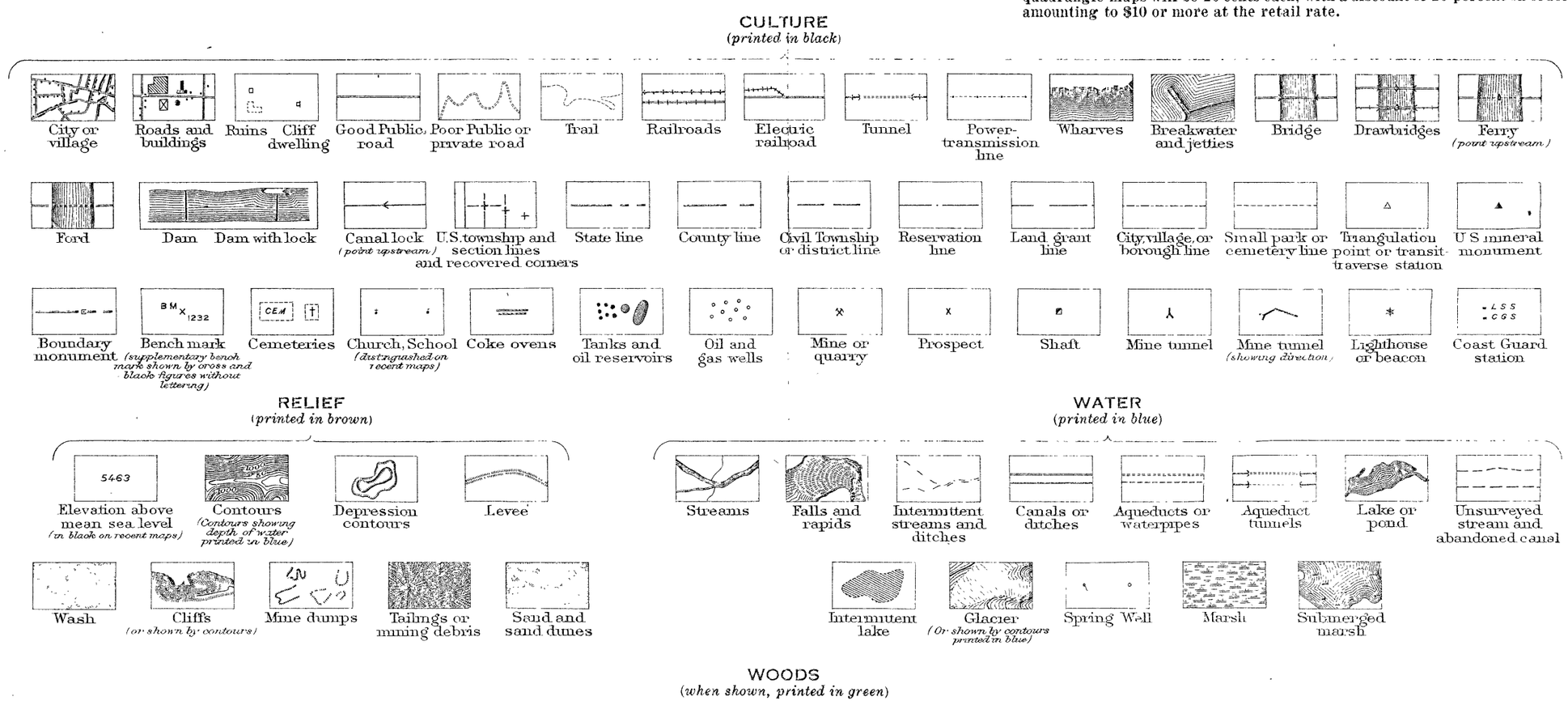
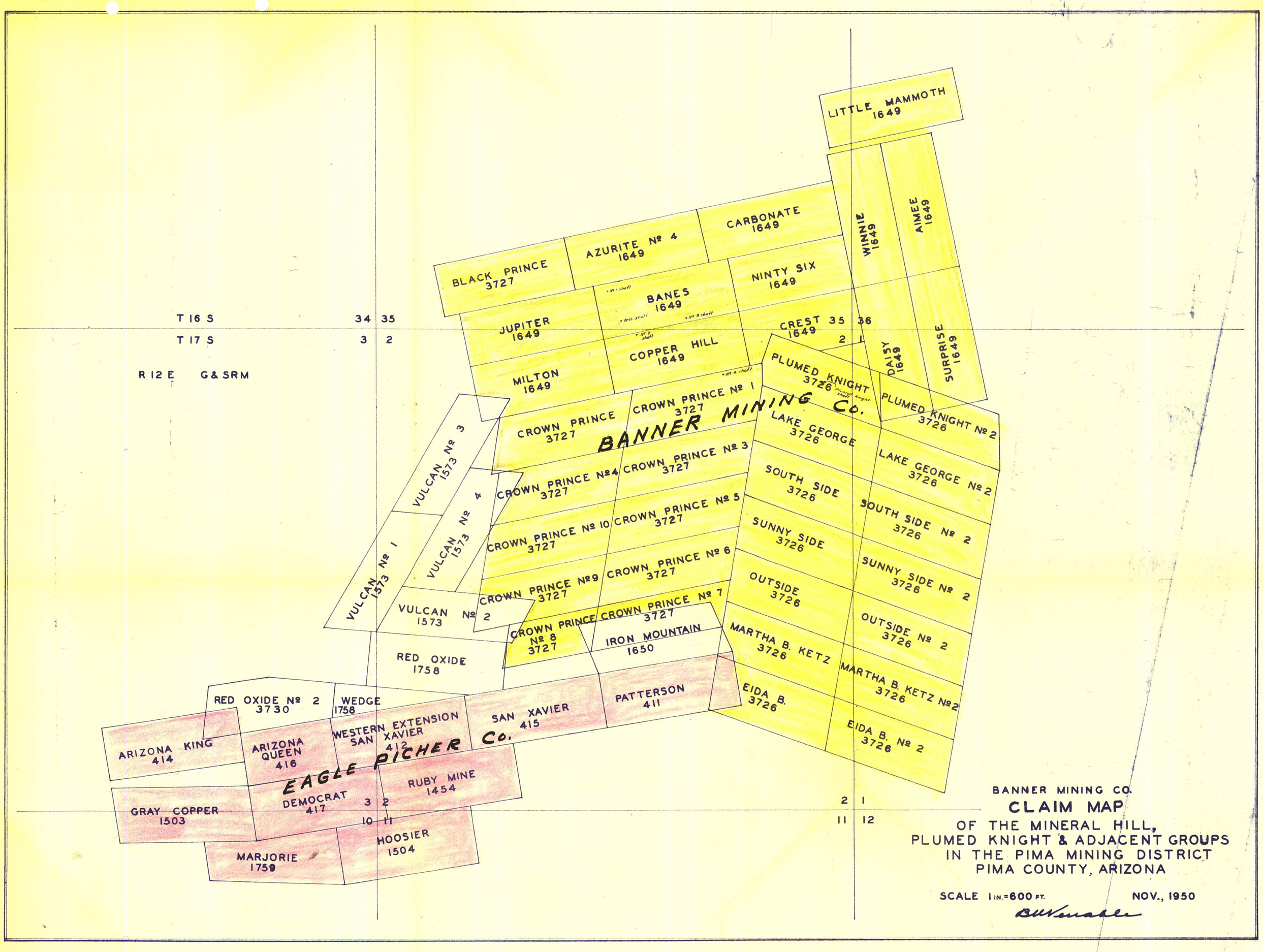




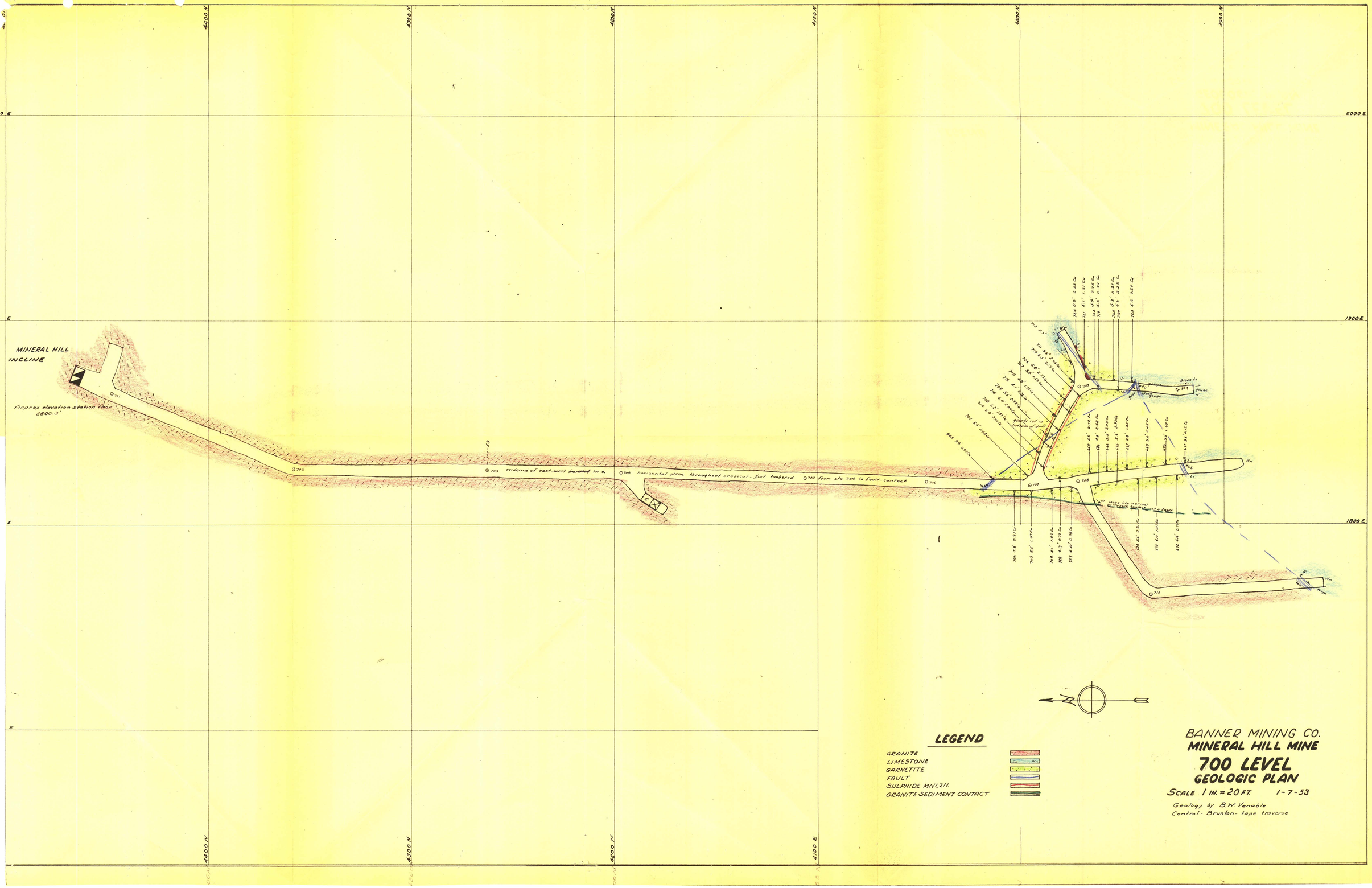
BANNER MINING CO.

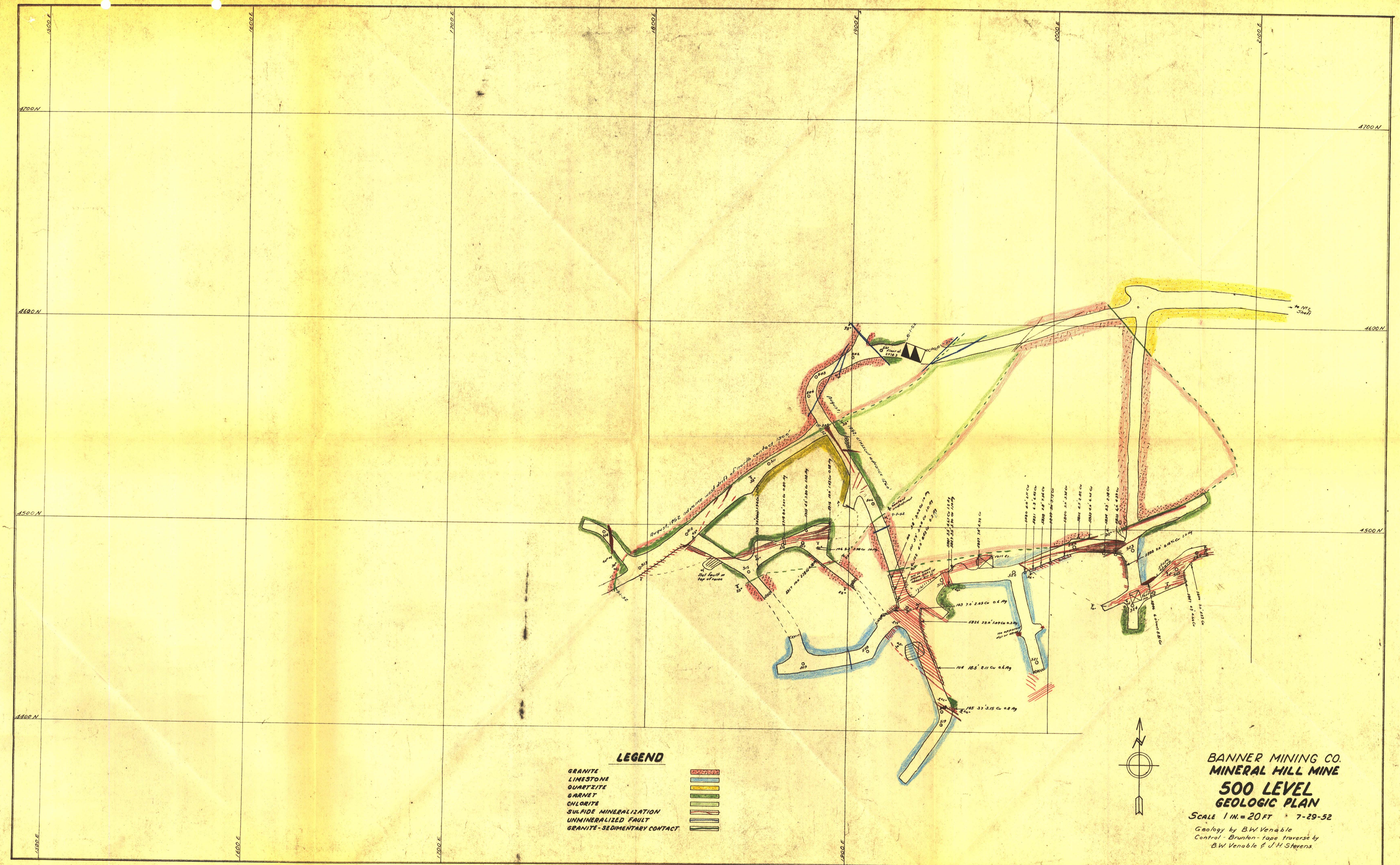
CLAIM MAP

OF THE MINERAL HILL,
PLUMED KNIGHT & ADJACENT GROUPS
IN THE PIMA MINING DISTRICT
PIMA COUNTY, ARIZONA

SCALE 1 IN.=600 FT. NOV., 1950

B.W. Snader


MINERAL HILL
INCLINE
Approx elevation station floor
2800.3'
evidence of east-west movement in a horizontal plane throughout crosscut. fault timbered from sta 704 to fault-contact
LEGEND
GRANITE
LIMESTONE
GARNETITE
FAULT
SULPHIDE MNLZN.
GRANITE SEDIMENT CONTACT
BANNER MINING CO.
MINERAL HILL MINE
700 LEVEL
GEOLOGIC PLAN
SCALE 1 IN. = 20 FT. 1-7-53
Geology by B.W. Venable
Control - Brunton - tape traverse


1500 E
1600 E
1700 E
1800 E
1900 E
2000 E
2100 E
4700 N
4600 N
4500 N
4400 N
LEGEND
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GARNET
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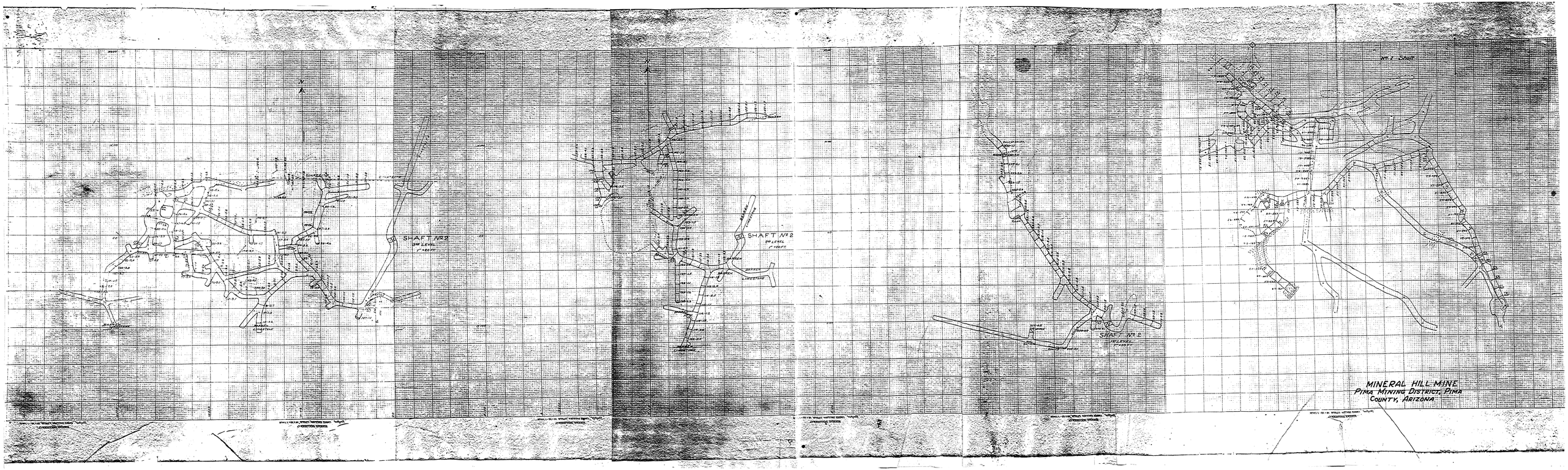
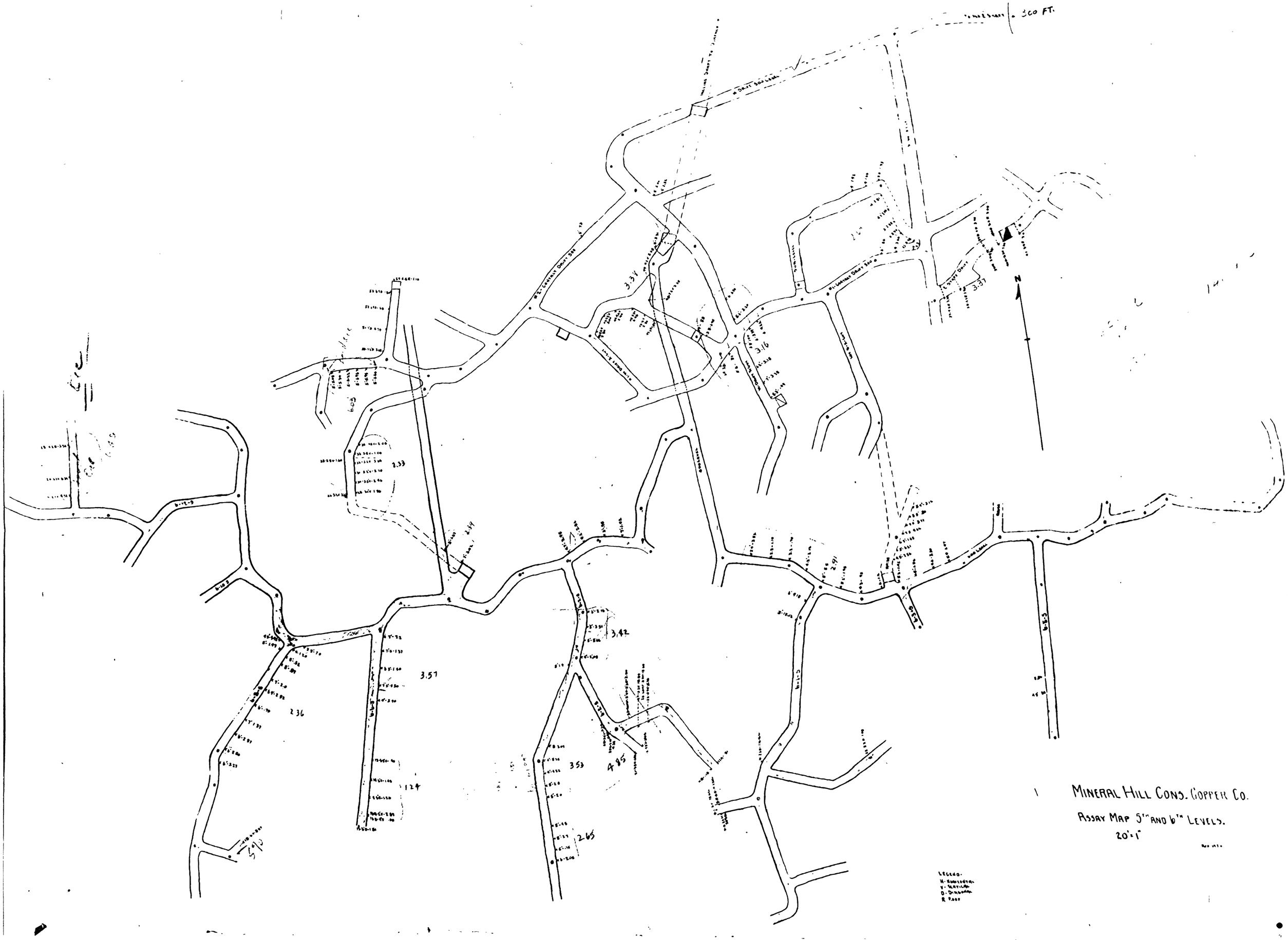

SHAFT No 2
3rd LEVEL
1" = 100 FT.
SHAFT No 2
4th LEVEL
1" = 100 FT.
SHAFT No 2
1st LEVEL
1" = 100 FT.
No 1 Shaft
MINERAL HILL MINE
PIMA MINING DISTRICT, PIMA
COUNTY, ARIZONA


300 FT.
N
3.31
3.16
2.33
2.34
3.57
2.36
3.42
3.53
4.85
2.65
2.91
1.24
MINERAL HILL CONS. COPPER CO.
ASSAY MAP 5TH AND 6TH LEVELS.
20'=1"

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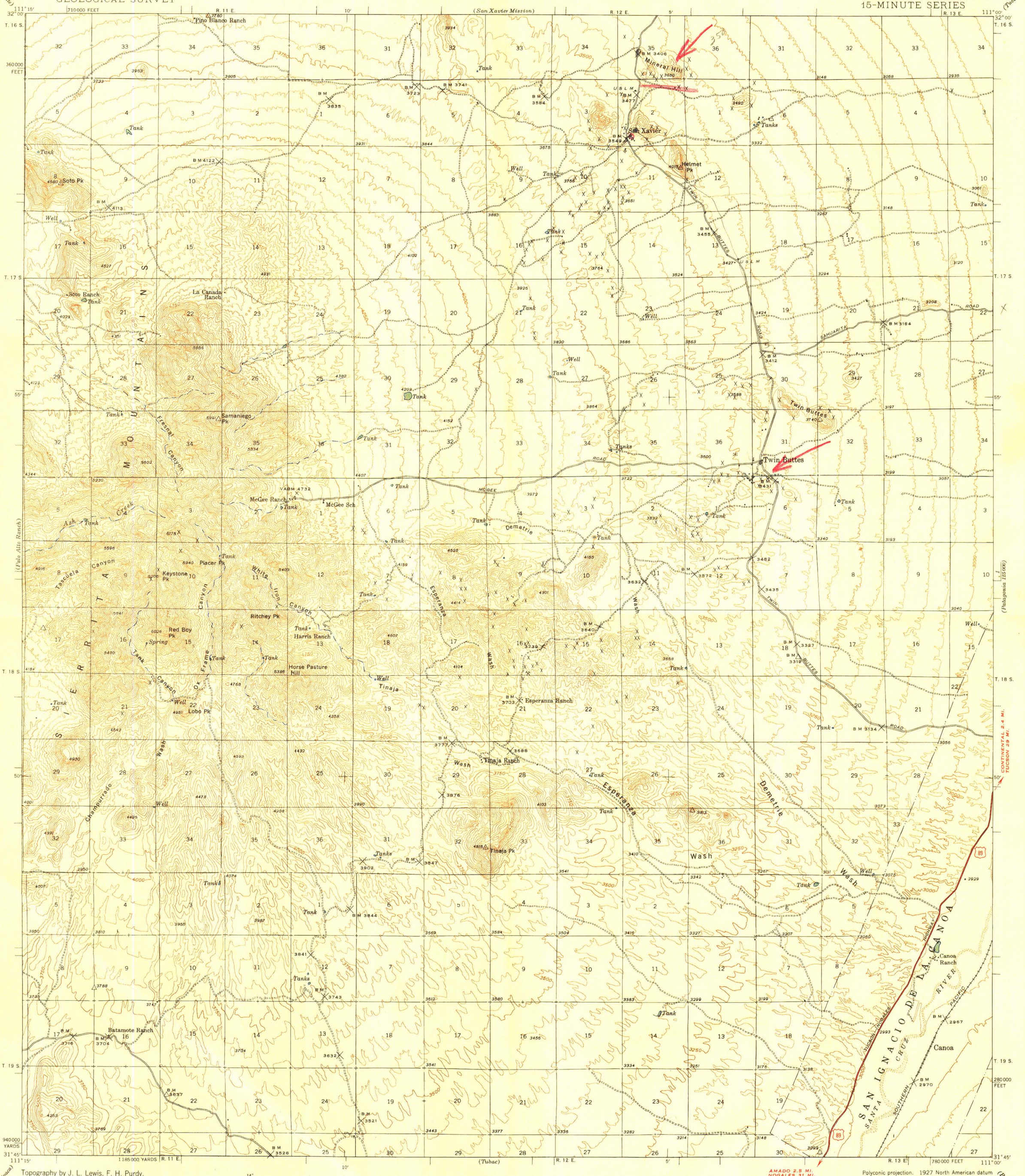

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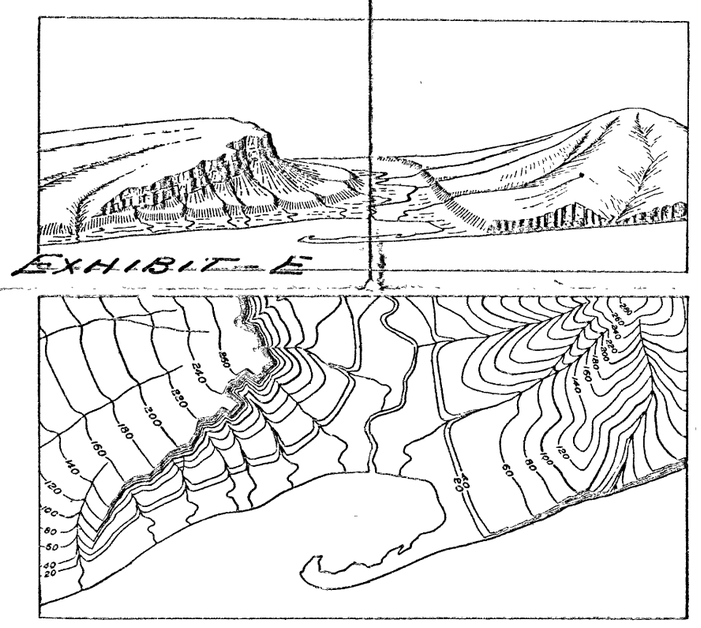

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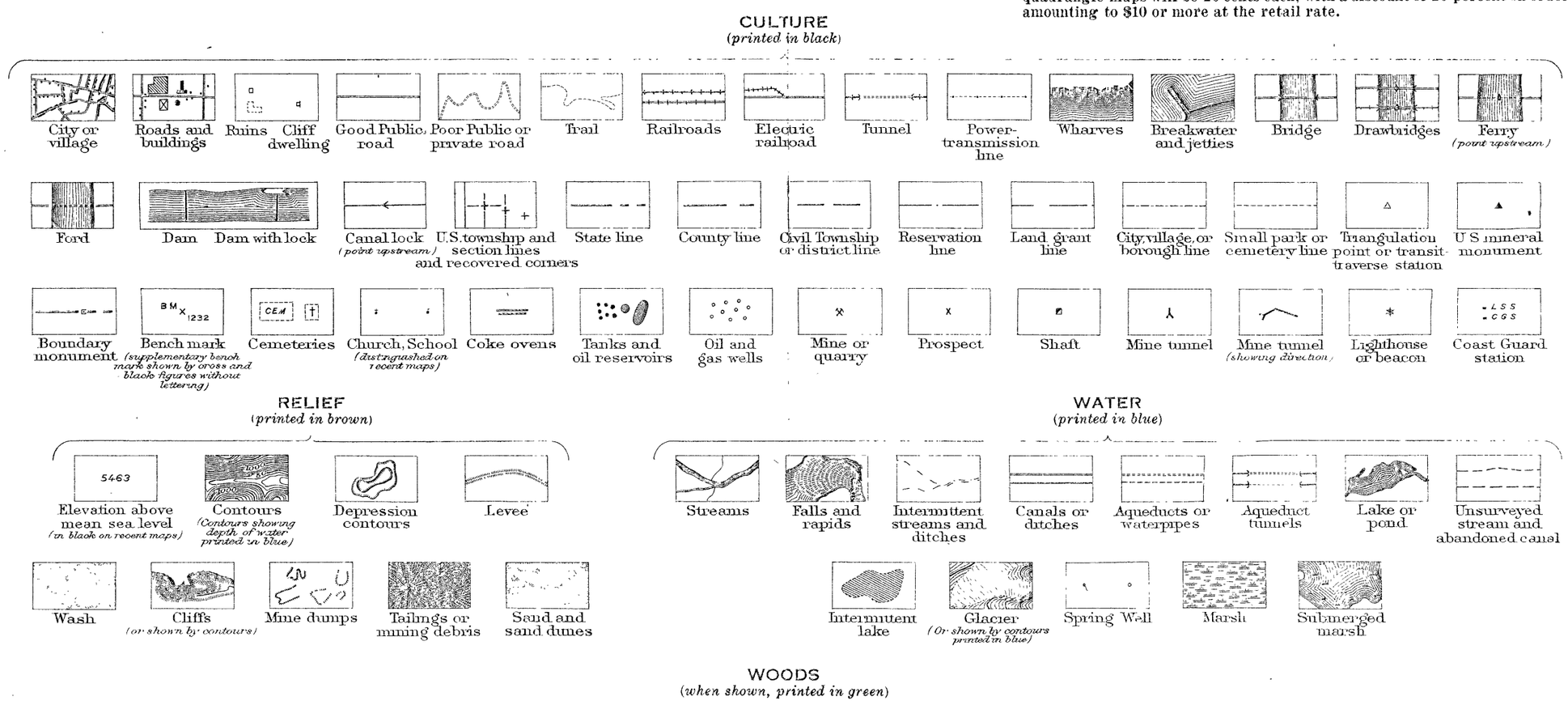

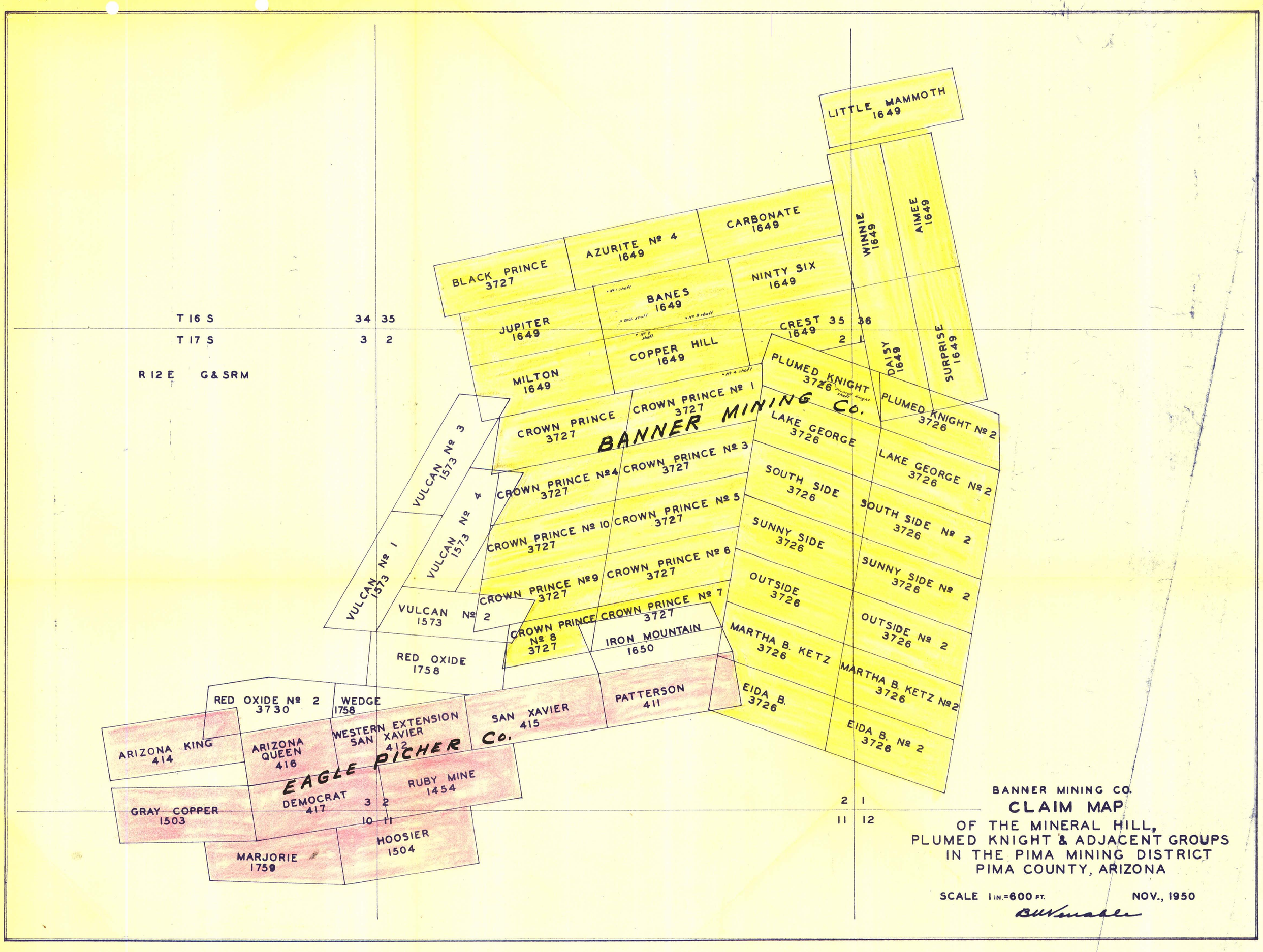

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SCALE 1 IN.=600 FT. NOV., 1950

B.W. Snader