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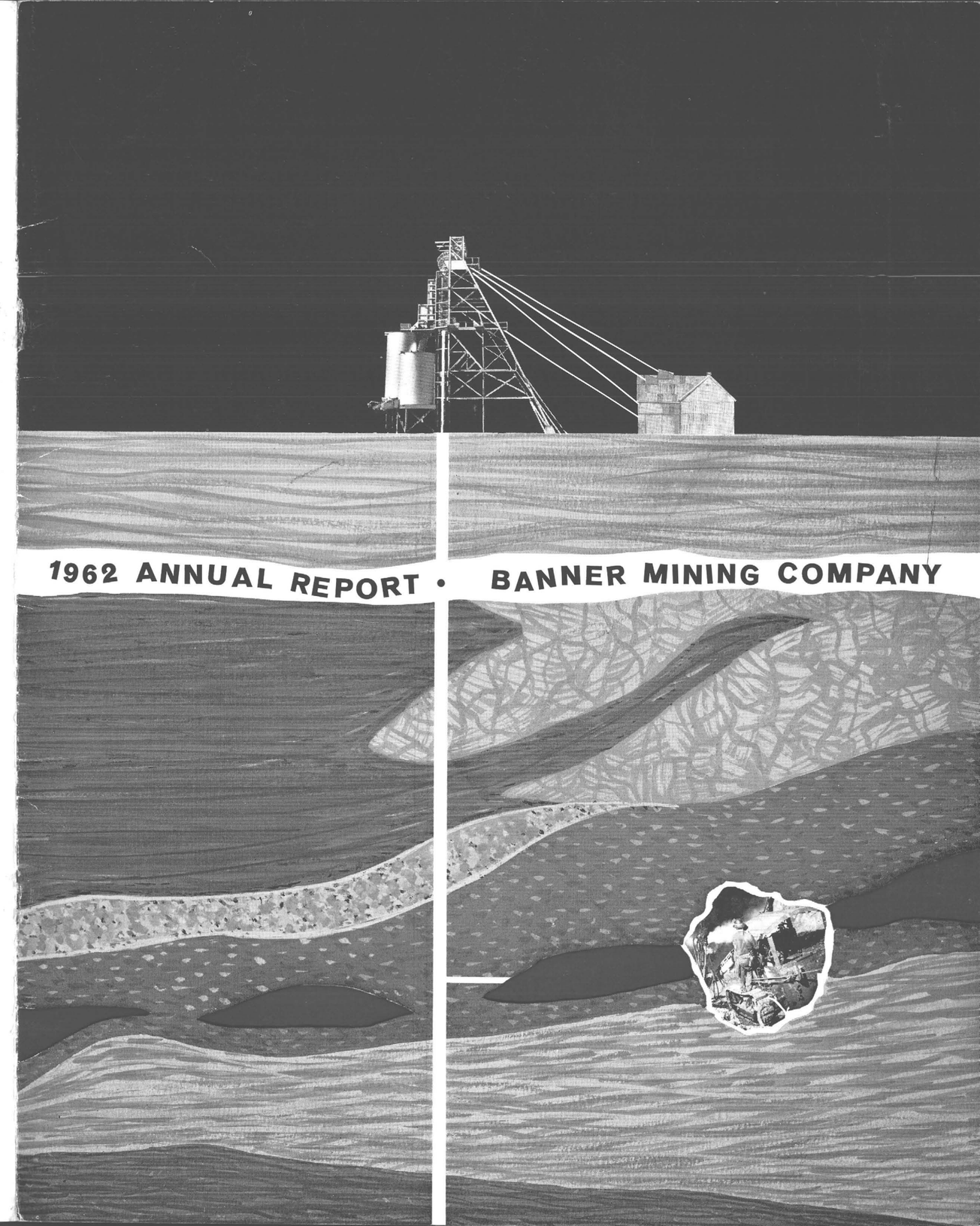
Banner Meeting

May 21, 1965

in Tucson.

S.L.Tribune, Wednesday, June 19, 1963

[redacted]



1962 ANNUAL REPORT • BANNER MINING COMPANY

MAP OF SOUTHERN ARIZONA & NEW MEXICO

SCALE OF MILES – 0 25 50 100

⊛ — PROPERTY OF BANNER MINING COMPANY

Banner Mining Company

ANNUAL REPORT

For the Year Ended December 31,

1962

GENERAL OFFICES
TUCSON, ARIZONA

Transfer Agent
Robert W. Bengtzen
132 S. Main Street
Salt Lake City, Utah
Registrar
Walker Bank & Trust Co.
Salt Lake City, Utah

ERNST & ERNST

800 PHOENIX TITLE BUILDING

TUCSON, ARIZONA

Board of Directors
Banner Mining Company
Tucson, Arizona

We have examined the statement of financial position of Banner Mining Company as of December 31, 1962, and the related statement of operations and retained-earnings deficit for the year then ended. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

In our opinion, the accompanying statement of financial position and statement of operations and retained-earnings deficit present fairly the financial position of Banner Mining Company at December 31, 1962, and the results of its operations for the year then ended, in conformity with generally accepted accounting principles applied on a basis consistent with that of the preceding year.

Ernst & Ernst

Certified Public Accountants

Tucson, Arizona
March 25, 1963

BANNER MINING COMPANY

TUCSON, ARIZONA

BOARD OF DIRECTORS

DAVID C. BINTLIFF	*Houston, Texas*
ALLAN B. BOWMAN	*Tucson, Arizona*
ERNEST S. BOWMAN	*Tucson, Arizona*
SHERMAN HINCKLEY	*Salt Lake City, Utah*
JAMES E. HOGLE	*Salt Lake City, Utah*
ROY M. JACOBS	*Milwaukee, Wisconsin*
STEWART MARK	*Oklahoma City, Oklahoma*
HAROLD E. RADDATZ	*La Jolla, California*
LEE L. TRAVIS	*Dallas, Texas*
JOHN M. WALLACE	*Salt Lake City, Utah*

GENERAL OFFICERS

L. L. TRAVIS	*President*
A. B. BOWMAN	*Vice President and General Manager*
JOHN M. WALLACE	*Vice-President*
JAMES E. HOGLE	*Secretary-Treasurer*

EXECUTIVE COMMITTEE

HAROLD E. RADDATZ	*La Jolla, California*
LEE L. TRAVIS	*Dallas, Texas*
SHERMAN HINCKLEY	*Salt Lake City, Utah*
ALLAN B. BOWMAN	*Tucson, Arizona*
JOHN M. WALLACE	*Salt Lake City, Utah*

OPERATING MINES

BONNEY MINE	*Lordsburg, New Mexico*
MISERS CHEST	*Lordsburg, New Mexico*
DAISY	*Tucson, Arizona*
PALO VERDE	*Tucson, Arizona*

TO THE SHARE OWNERS OF BANNER MINING COMPANY

The year just past was a most significant one for your Company. It was both a year of growth and a year of major decisions. The highlights of your company's activities during 1962 were: the increase in the core-drilled ore reserves and the acquisition of additional mining properties with large copper-ore potentials.

Banner's Palo Verde ore-body is a part of the same ore-body being mined from American Smelting & Refining Company's adjoining Mission open-pit project. As of January 1, 1963 our drilling program in the group of state mineral leased claims in the vicinity of the Palo Verde Mine indicates low grade open pit type mineral reserves of about 65,350,000 tons. Considerable drilling remains to be done to fully evaluate this area. This drilling in part will be in an area which is at present surrounded on three sides by completed drill holes. Projections into this area from known drill holes indicate a possible addition to the above reserves of an estimated 11,000,000 tons. Besides copper recoverable molybdenum and silver values are also present in the ores.

Extensive studies were made during the year to determine the best plan for financing a contemplated Palo Verde open-pit mining and milling project, which is estimated to cost approximately $40,000,000.00. After months of negotiations an Option-Lease Agreement was made with The Anaconda Company, effective March 1, 1963, under which Anaconda will explore and develop the Palo Verde area and certain other properties in Pima County, Arizona, for a period of time, after which Anaconda may lease the properties from Banner and conduct mining and milling operations thereon.

The lease agreement provides for payment of substantial advance royalties to Banner prior to commencement of commercial production. After commercial mining operations begin a minimum daily milling operation of 15,000 tons of ore is contemplated by the agreement. The mining properties involve certain major copper prospects, and the exploration and development program could result in the development of large, new copper-ore reserves, and the need for more milling facilities than the 15,000 ton mill contemplated for the Palo Verde orebody. Exploratory and development operations and the construction of mining and milling facilities could involve multimillion dollar expenditures, which are to be advanced by Anaconda under the agreement.

The agreement also covers the extension of the Pima ore-body being mined by Pima Mining Company by open-pit methods on Banner ground, except ore from the so-called Pima cone which is reserved by Banner. Banner's New Mexico mines and properties in other areas in Arizona are not included in the Anaconda agreement.

Our Vice President and General Manager, Allan Bowman, was selected by the Society of Mining Engineers of the American Institute of Mining, Metallurgical and Petroleum Engineers to receive the Jackling Award at its annual convention in Dallas, Texas, on February 27, 1963. This award is one of the highest in the mining industry and is presented for significant contributions to technical progress in the fields of mining, geology and geophysics. I had the privilege and honor of presenting the award.

On behalf of the Board of Directors, we again thank our stockholders, staff and other employees for their part in promoting the interests of the Company the past year.

Respectfully submitted,

Lee L. Travis

President

NOTES TO FINANCIAL STATEMENTS

BANNER MINING COMPANY

December 31, 1962

NOTE A — DEFERRED DEVELOPMENT COSTS

The Company has deferred costs incurred in the development of new properties. The net proceeds from ore sold during the development period have been credited to the development costs. Upon completion of development the deferred costs will be amortized on the basis of ore mined, and at a rate which will spread the costs over the known ore reserves.

NOTE B — LONG-TERM DEBT

The details of long-term debt are summarized as follows:

	Current Maturities	Long-term
6% notes payable to banks	$500,000.00	$1,455,000.00
Non-interest bearing advances	—0—	300,000.00
Contracts for purchase of royalty interest, mining claims, leases, and properties:		
Payable to stockholder—$17,000.00 annually	17,000.00	206,500.00
Payable to others—$70,500.00 annually to 1965 and at reduced amounts thereafter	70,500.00	307,500.00
TOTAL	$587,500.00	$2,269,000.00

The 6% notes payable to banks are unsecured and are payable $500,000.00 in 1963; $420,000.00 in 1964, 1965 and 1966; and $195,000.00 in 1967.

The non-interest bearing advances are unsecured and are payable $225,000.00 in 1968 and $75,000.00 in 1969.

NOTE C — CONTINGENCIES

The Company is holding certain mining claims and leases under lease option agreements providing for the payment of $4,720,127.27 over various periods through 1986 in the form of royalties or minimum rentals. These agreements may be terminated without penalty upon written notice to the lessor. All payments made through December 31, 1962, in accordance with the terms of these agreements have been capitalized and are included in mining claims and leases. Minimum payments of $124,219.34 will be due in the year ending December 31, 1963.

NOTE D — SUBSEQUENT EVENT

The Company entered into an agreement with The Anaconda Company dated March 1, 1963, which grants to The Anaconda Company an exclusive option to lease all mining and other real properties of the Company located in Pima County, Arizona, except that part of the Company's property which is a part of the Pima Pit, the ores from which are being mined and milled under contract by Pima Mining Company. Under this agreement, The Anaconda Company has until April 15, 1964, to lease these properties for an initial term of 60 years with the right of The Anaconda Company successively to extend the term of this lease by giving notice for such additional periods as The Anaconda Company may deem necessary to exhaust the mineral deposits in these properties.

STATEMENT OF OPERATIONS AND RETAINED-EARNINGS DEFICIT

BANNER MINING COMPANY

Year ended December 31, 1962

Ore sales		$6,623,452.11
Costs and expenses:		
Mining and milling	$4,592,785.89	
Smelter charges	1,445,987.81	
Administrative and general	529,244.06	
Depreciation	172,861.33	
Amortization of development costs	270,020.68	
Maintenance of non-operating mines	50,693.24	
Depletion	23,924.64	
Research and experimental	12,836.14	7,098,353.79
		$ 474,901.68*
Other income		13,819.61
NET LOSS		$ 461,082.07*
Retained earnings at January 1, 1962		460,598.27
RETAINED-EARNINGS DEFICIT AT DECEMBER 31, 1962		$ 483.80

* Indicates loss

See notes to financial statements

General Manager's Report

During 1962 a great deal of interest was shown in our company by major copper producers and other companies who were interested in our large copper reserves. These companies made extensive studies of our engineering and geological data relating to feasibility of projects on our present reserves and the required exploration program to check out other favorable mineral targets on our properties. After several months of negotiations an agreement was reached with The Anaconda Company which was outlined to you in a letter dated March 6, 1963.

We continued to operate at a normal rate at all mines during most of the year. Gross income from the sales of concentrates from all mines during 1962 totalled $6,623,452.11, an increase of 120.09% over the $3,009,927.91 received during 1961. Our income came from the normal operations of the Bonney-Misers Chest Mines in New Mexico and from mining and development work in the Palo Verde Mine. Also included in the above 1962 total was income derived from the Daisy Mine area under the Custom Mining and Milling Agreement with Pima Mining Company.

The loss of $461,082.07 for the year stems mainly from the higher than normal mining costs caused mainly by extremely hard rock and the problems connected with the mining of many faulted segments of the ore zone.

The Statement of Operations and Retained-Earnings Deficit for 1962 includes items which were not cash expenditures during the year. Some of these are depreciation $172,861.33, depletion $23,924.64, amortization of development costs $270,020.68 totalling $466,806.65 which are included in the net loss.

DAISY MINE

Pima Mining Company commenced production of ore from Banner ground under the areement of November, 1959. Under the agreement Pima is required to mine, mill and pay Banner for the copper and silver in an average annual tonnage of 256,670. Pima met this average requirement for 1962 and Banner received payment for this tonnage less costs. We were paid for 7,336,193 pounds of copper.

952,000 dry tons of oxidized material estimated by Pima Mining Company engineers to average 1.08 per cent copper were excavated by Pima from the Daisy Cone Volume and stockpiled on Banner property during 1962. This brings the total of such material stockpiled on our property to a grand total of 1,013,137 tons. 114,587 tons of low grade sulphides were also stockpiled for us by Pima. 7091 tons of the best of these sulphides were concentrated at our Mineral Hill mill. No active underground mining was carried on in the Daisy Mine.

The aerial photograph on the center pages of this report shows where the Pima pit is being extended into Banner ground and is the location from which the ores were extracted in 1962. The solid black line is the boundary line of Banner properties in the northern part of the Pima Mining district.

PALO VERDE MINE

A total of 243,072 tons of ore were produced from stoping and development headings during the year. This is an average of 20,256 tons per month. All of this ore was milled in our Mineral Hill mill. Two additional ventilation holes drilled during the year increased the flow of air through the mine by about 50%. Inflow of water into the mine decreased to less than 250 gallons per minute by years end.

Considerable progress has been made recently on the use of larger drilling and mucking machines underground resulting in increased efficiency over the smaller conventional type machines used in the past.

Our labor contract was open for negotiations during the latter part of 1962. At this writing no agreement has been reached.

BONNEY-MISERS CHEST MINES

A total of 95,270 tons of ore averaging 0.016 ounces gold per ton, 0.61 ounces of silver per ton and 2.36 per cent copper were mined and milled from these properties in 1962. This is an increase of 7.05% over 1961. 7864 tons of concentrate were produced from these ores with a metal content of 1208 ounces of gold, 55,952 ounces of silver and 4,285,135 pounds of copper.

The lowest operating level of the Bonney Mine is 1700 feet below the surface and is equal to the deepest previous operating depth in the district. We are at present sinking the main shaft to the 1835 foot level. We anticipate increased mining costs at this mine on account of the greater depths and distances from working shafts.

Development headings have been extended from the Bonney Mine on the 1290, 1440 and 1560 levels over to and along the Oro Vein zone. A mining length of 700 feet has been opened on this vein on the 1440 foot level.

EXPLORATION PROJECTS

Core drilling was continued during portions of the year at Twin Buttes and Helvetia. 7936 feet were completed at Helvetia and 6411 feet at Twin Buttes. Much more drilling is required at both locations to fully evaluate each area which will be continued. We still feel that both districts hold favorable prospects.

RESEARCH

Laboratory and pilot plant work have been continued on ways and means of improving our alkaline leaching process for use on oxidized copper in a limestone derivative gangue with good results.

Considerable effort has also been expended in testing the Helvetia ores for best possible recovery of contained minerals and the Palo Verde mine ores for the recovery of the contained molybdenum. Results on both ores have been encouraging.

We wish to thank the entire operating staff for their fine work and loyal support.

Respectfully yours,

A. B. Bowman

Vice President and General Manager

LIABILITIES AND STOCKHOLDERS' EQUITY

CURRENT LIABILITIES		
Note payable		$ 200,000.00
Accounts payable and accrued expenses		264,409.26
Due to stockholders—unsecured		1,030,000.00
Current maturities of long-term debt		587,500.00
TOTAL CURRENT LIABILITIES		$2,081,909.26
LONG-TERM DEBT, less current maturities—Note B		2,269,000.00
STOCKHOLDERS' EQUITY		
Common Stock—par value $1.00 a share:		
Authorized 600,000 shares		
Issued and outstanding 580,030 shares	$ 580,030.00	
Paid-in capital (no change during the year)	1,020,097.10	
Retained-earnings deficit (deduction*)	483.80*	1,599,643.30
CONTINGENCIES — Note C		
		$5,950,552.56

See notes to financial statements

Statement of Financial Position

BANNER MINING COMPANY

December 31, 1962

ASSETS

CURRENT ASSETS		
Cash		$ 136,555.40
Accounts receivable		369,929.87
Inventories — at lower of cost (first-in, first-out) or market:		
Ore		41,223.37
Operating supplies		267,676.91
Prepaid expenses		12,386.32
TOTAL CURRENT ASSETS		$ 827,771.87
PROPERTY, PLANT, AND EQUIPMENT—on the basis of cost — Note B		
Mining claims and leases (including exploration costs), and properties, less $657,918.80 allowances for depletion	$2,574,453.96	
Buildings and equipment, less $1,970,653.57 allowances for depreciation	1,321,841.30	3,896,295.26
DEFERRED DEVELOPMENT COSTS, less $340,767.43 allowance for amortization — Note A		1,189,536.50
OTHER ASSETS		36,948.93
		$5,950,552.56

PRODUCTION DATA

Mine	Location	Type of Ore	1962 Tonnage	1961 Tonnage
Daisy*	Tucson, Arizona	Sulphide	256,670*	245
Palo Verde	Tucson, Arizona	Sulphide	243,072	158,546
Bonney-Misers Chest	Lordsburg, New Mexico	Sulphide	95,270	88,998
Totals			595,012	247,789

Metal content of all concentrates is tabulated for our two areas of production—namely—Tucson, Arizona and Lordsburg, New Mexico.

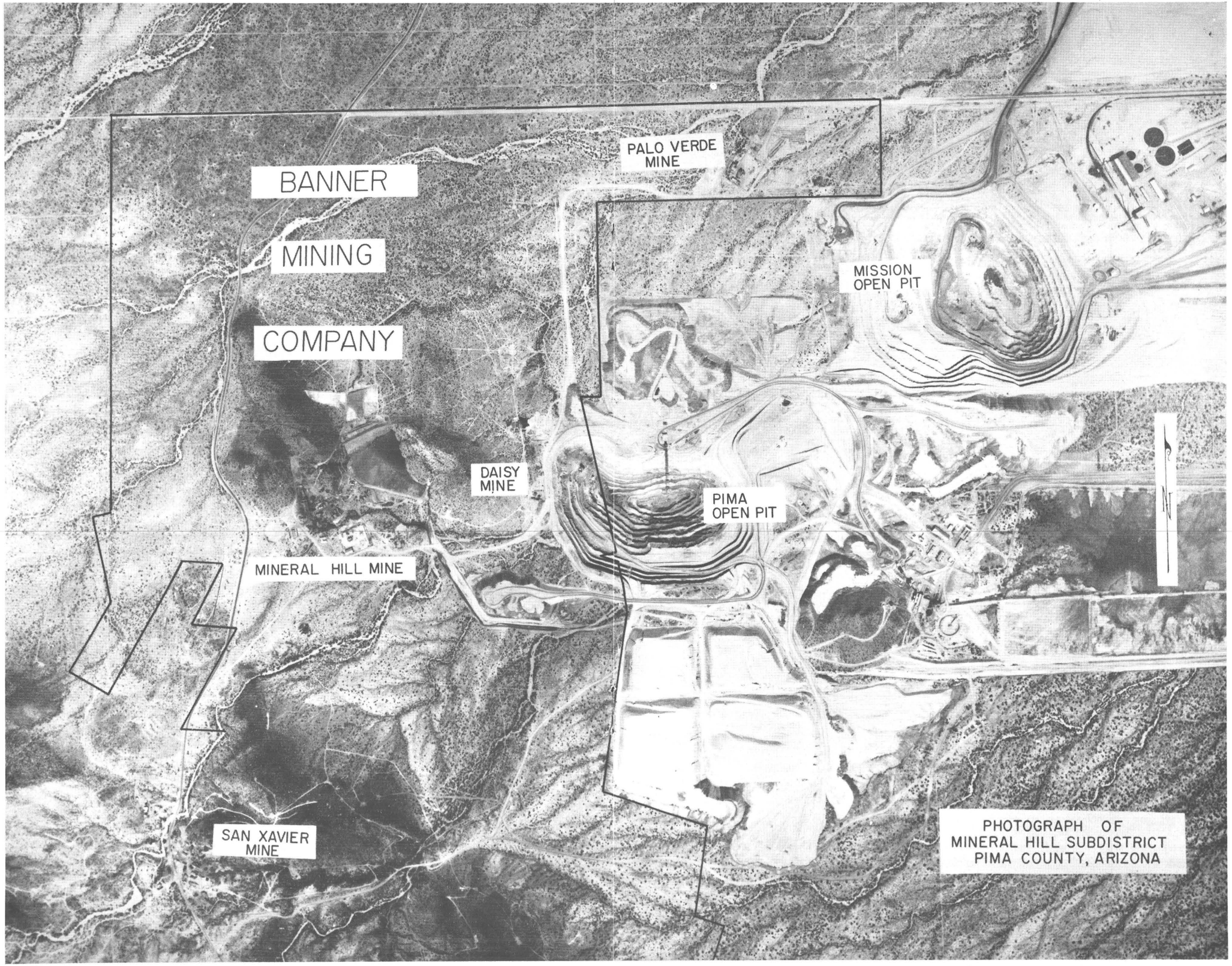
	1962 Metal Content				1961 Metal Content			
	Tons	Oz. Gold	Oz. Silver	Lbs. Copper	Tons	Oz. Gold	Oz. Silver	Lbs. Copper
Arizona	34,048*	24.53*	199,417*	17,245,246*	12,950	80.53	102,106	6,983,029
New Mexico	7,864	1,207.89	55,952	4,285,135	7,280	1,653.76	38,217	3,895,612
Totals	41,912	1,232.42	255,369	21,530,381	20,230	1,734.29	140,323	10,878,641

* Production Note:

Under our custom mining and milling agreement with Pima Mining Company, Pima is required to mine and mill an average of 256,670 tons annually from our Daisy Mine and to pay Banner for the recovered silver and 7,336,193 pounds of copper after milling, smelting and refining losses. These totals are taken into account in arriving at the above 1962 production figures from Banner properties.

DEVELOPMENT & EXPLORATORY WORK — —ALL MINES — 1962

	Crosscutting and Drifting	Raising	DRILLING Diamond	Rotary	Churn	Longhole
ARIZONA	Feet	Feet	Feet	Feet	Feet	Feet
Palo Verde	3,382.5	1,943.0	1,399.5		1,260.0	11,150.0
Mineral Hill-Daisy Area			499.0			
Twin Buttes			3,010.5	3,141.0	260.0	
Helmet Peak			5,804.0			
Amole District			273.5			
Helvetia District			6,965.0		971.0	
Miscellaneous			855.0		135.0	
Totals—Arizona	3,382.5	1,943.0	18,806.5	3,141.0	2,626.0	11,150.0
NEW MEXICO						
Bonney-Misers Chest	3,166.7	364.0	2,448.5			844.0
Grand Total—All Areas	6,549.2	2,307.0	21,255.0	3,141.0	2,626.0	11,994.0



PHOTOGRAPH OF
MINERAL HILL SUBDISTRICT
PIMA COUNTY, ARIZONA

S.L.Tribune, Wednesday, June 19, 1963

Firms Report Stock Transactions

Securities and Exchange Commission Tuesday reported receipt between April 11 and May 10 of following stock transactions of Intermountain Area firms:

R. L. Jourdan bought 300 shares; **Harry W. Grose** 500 shares and **Simon D. Strauss** 2,900 shares, increasing holdings respectively to 571 shares, 600 shares and 3,000 shares of **American Smelting & Refining Co.** . . . **Eugene S. Northrop** bought an initial 500 shares and **David A. Stretch** a total of 2,200 shares, hiking their respective interests in **Atlas Corp.** to 500 and 7,165 shares . . . **David C. Bintliff** sold employes 1,850 shares of **Banner Mining Co.** stock, leaving him beneficial owner of 20,959 shares.

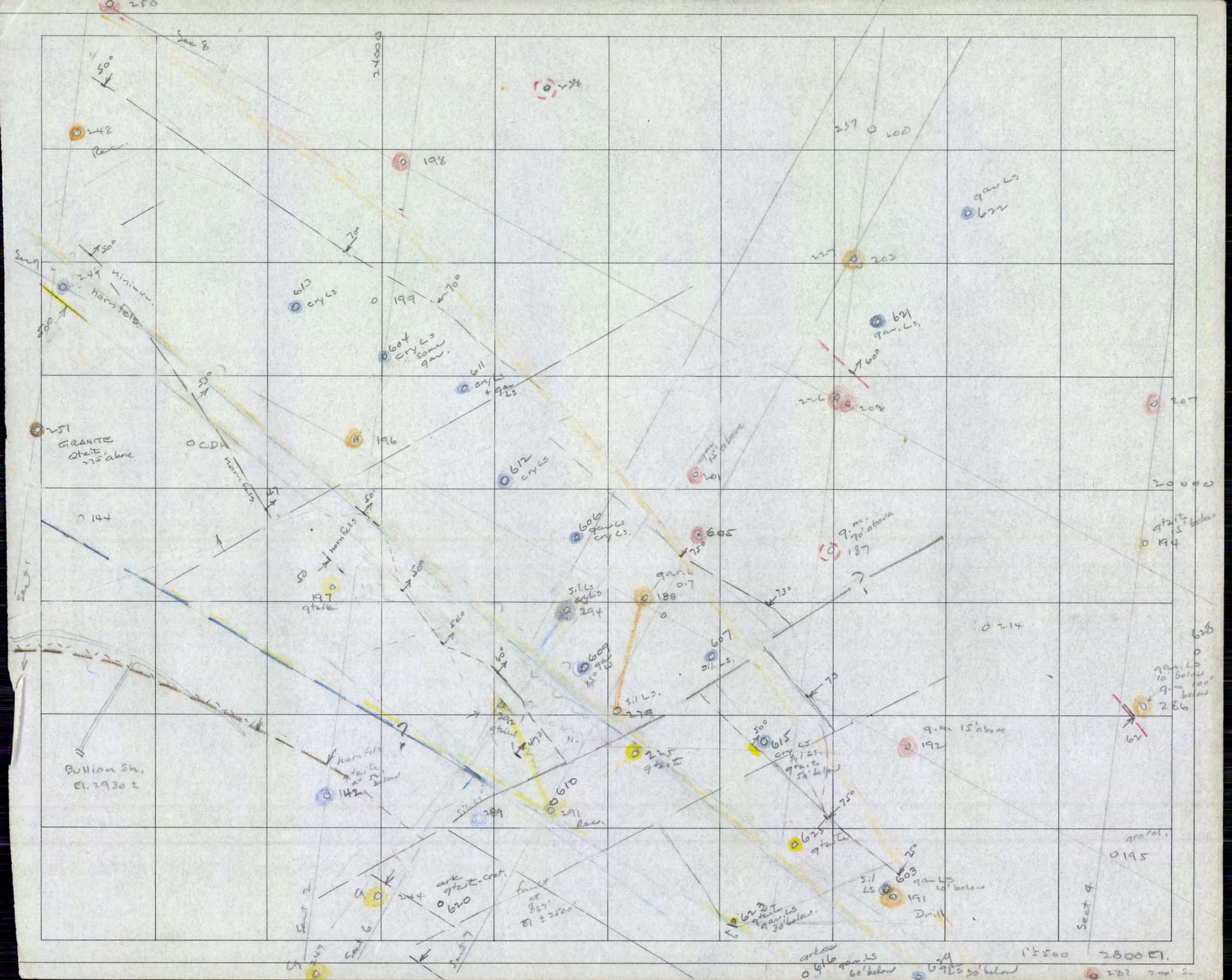
John M. Wallace bought 600 shares and then sold 200 shares of **Banner**, leaving him owner of 18,814 shares of **Banner**.

R. K. Bradford 300 shares and **D. D. Moffat**, 500 shares, **Denver & Rio Grande Western Railroad Co.** stock, leaving them 400 and 2,500 shares each. . . . **Wallace McGregor** bought 1,000 shares of **Mountain States Development Co.**, increasing interests to 1,500 shares.

W. D. Nebeker Jr. bought 4,250 shares of **MSD** at private sale and 145,631 at an assessment sale, hiking holdings to 525,181 shares . . . **Elmer F. Johnson** sold 510 shares, or all of his holdings, in **Nevada Power Co.**

C. L. Ronnow sold 5,000 shares, leaving him 117,375 shares of the utility. . . . **Simon B. Eggertsen** bought 1,000 shares of **Rico Argentine Mining Co.** stock, increasing holdings to 24,000 shares.

David C. Bintliff bought 4,300 shares of **Tintic Standard Mining Co.** stock, increasing interests to 109,500 shares. . . . **J. J. Taylor** sold 200 shares of **Western Airlines, Inc.**, leaving him 2,500 shares.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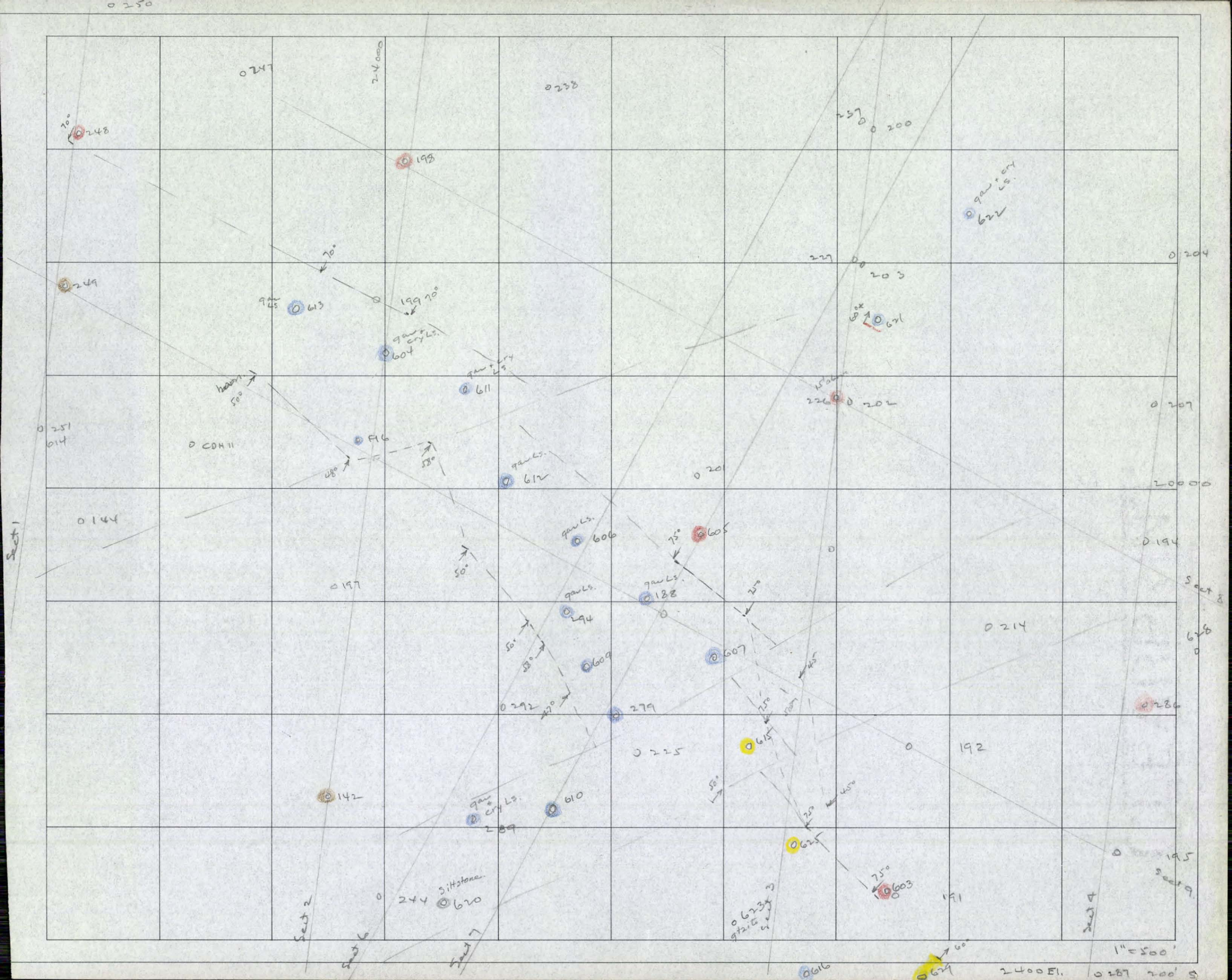
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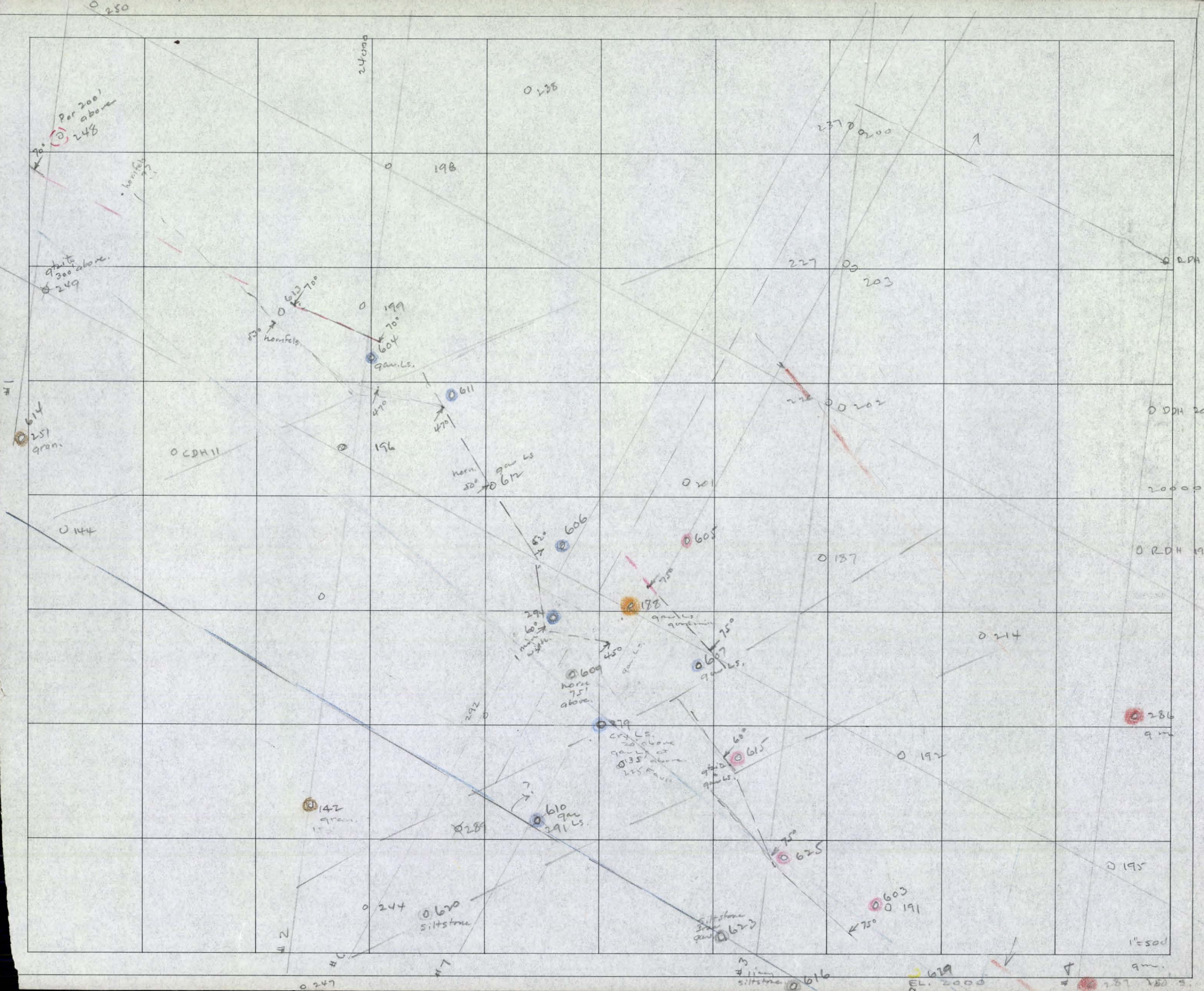
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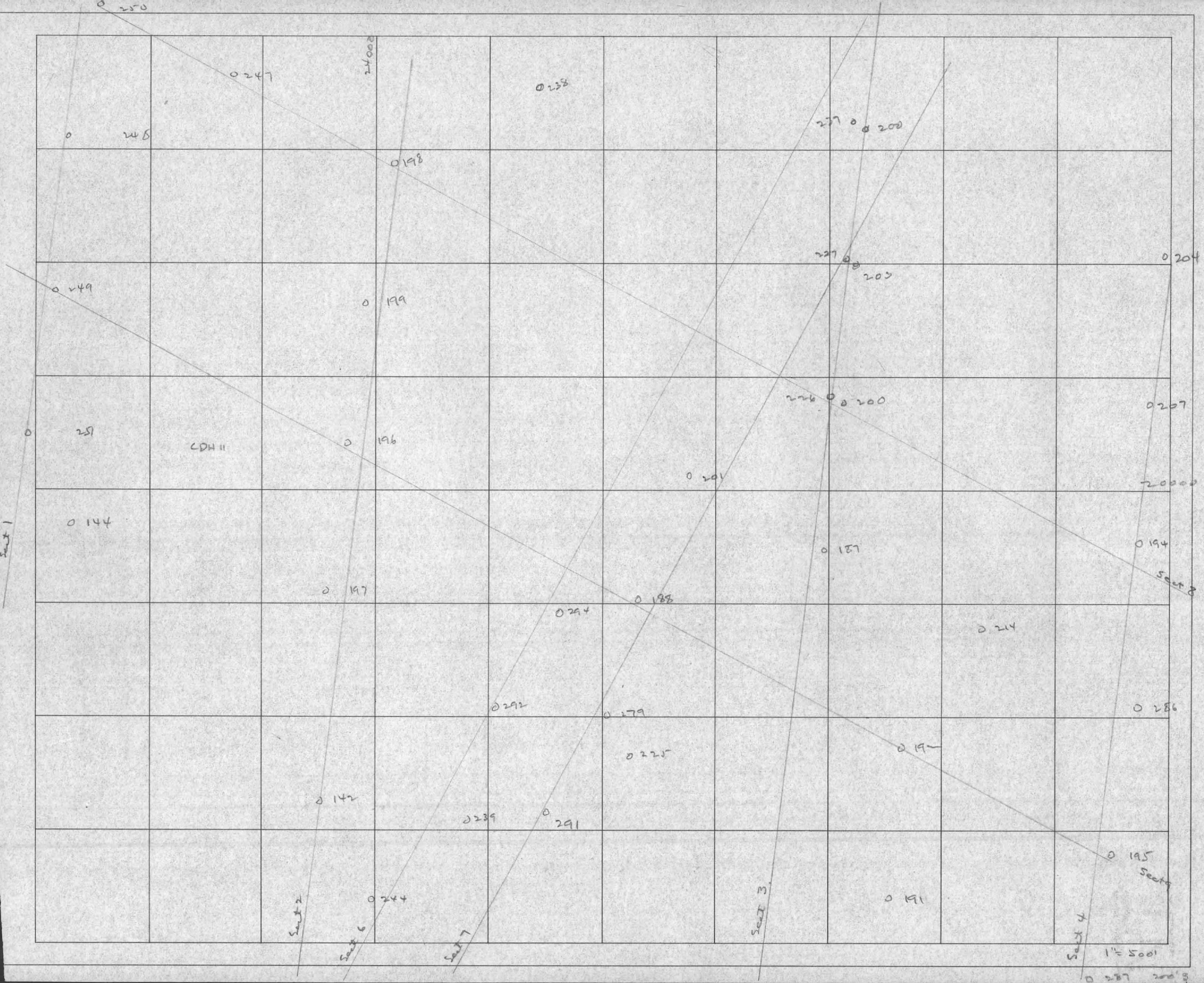
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ORM 167 4-26-61 2M

THE ANACONDA COMPANY

GEOLOGICAL DEPARTMENT

RECOMMENDATION FOR DEVELOPMENT WORK

MINE WEST HELVETIA
Old Dick Mine Area
COUNTY Pima STATE Ariz.

REC. NO. 15

To:

Description: Diamond drill a vertical hole at approximate coordinate location N. 314,150, E. 852,880.

Object: To prospect for possible mineralized sediments below Cretaceous clastics exposed northeast of the Old Dick Shaft.

Approximate Amount of Work 400 ft.
Date of Recommendation October 3, 1963
Date Started
Date Finished
Results:

Recommended by S. A. Barker

Approved by Robert B. Emmons

cc Mr. V. D. Perry
Mr. J. B. Knaebel

FORM 167 4-26-61 2M

THE ANACONDA COMPANY

GEOLOGICAL DEPARTMENT

RECOMMENDATION FOR DEVELOPMENT WORK

MINE WEST HELVETIA
Copper World Area
COUNTY Pima STATE Ariz.

REC. NO. 17

To:

Description: Diamond drill a hole S. 60° W. at an inclination of minus 45° from a site at approximate coordinate location N. 313,730, E. 857,800.

Object: To prospect the downward extension of copper minerals exposed on the surface southeast of the Copper World Mine area.

Approximate Amount of Work 600 ft.
Date of Recommendation October 3, 1963
Date Started
Date Finished
Results:

Recommended by J. A. Barber

Approved by Roland B. Mulchay

cc Mr. V. D. Perry
Mr. J. B. Knaebel

FORM 167 4-26-61 2M

THE ANACONDA COMPANY

GEOLOGICAL DEPARTMENT

RECOMMENDATION FOR DEVELOPMENT WORK

MINE WEST HELVETIA
Copper World Area
COUNTY Pima STATE Ariz.
REC. NO. 16

To:

Description: Diamond drill a vertical hole at approximate coordinate location N. 314,100, E. 858,180.

Object: To prospect a geophysical anomaly covering a possible downward extension of mineralized limestone beds southeast of the Copper World Mine area.

Approximate Amount of Work 1000 ft.
Date of Recommendation October 3, 1963
Date Started
Date Finished
Results:

Recommended by F. A. Baker

Approved by Robert A. Murray

cc Mr. V. D. Perry
Mr. J. B. Knaebel

BANNER MINING COMPANY

P.O. BOX 5605 TUCSON, ARIZONA PHONE AXminister 4-1488

A. B. BOWMAN
VICE-PRES. & GEN. MGR.

L. L. TRAVIS, President

April 1, 1963

Mr. Roland B. Mulchay
Regional Geologist
The Anaconda Company
Kearns Building
Salt Lake City, Utah

Dear Roland:

Enclosed please find the copy of the written portion of "The History, Growth and Development of a Small Mining Company" which you asked to be mailed to you.

The A.I.M.E. have all of the photographs of the slides so am unable to enclose them.

Looks as though we are going to have a strike here on April 8th. I advised Kelly about one week ago when it became official. In my opinion at this time I do not believe they can keep your drillers from going through the picket lines as they are not unionized.

Kindest personal regards.

Sincerely yours,

Allan Bowman

A. B. Bowman

AB:d

THE HISTORY, GROWTH AND DEVELOPMENT OF A SMALL MINING COMPANY

Several years ago a wealthy Chinese business friend of mine purchased an interest in a proposed well to be drilled for oil a great distance from his home. A few months later it came in as a producer and proved to be a huge success and materially added to his resources. I asked him why a man of his wealth should be so lucky in a venture outside his sphere of knowledge when most people of modest means never seemed to get ahead. His answer was, "Fat Hoy takes a chance." Even though this was his answer, I knew from my association with him that there were other tempering considerations which Mr. Hoy applied before making up his mind to enter any transaction. First, he was a cautious individual. He was also a great believer in details and insisted on knowing everything possible about a situation, and, finally, he was what you and I call a very solid individual with good basic instincts and judgment.

This philosophy of Mr. Hoy may be applied to most any business but especially to those engaged in a search for natural resources such as mining where great risks are involved.

My discussion herein will concern events in the history and growth of Banner Mining Company with which I have been associated for twenty-seven years in capacities from mine surveyor to my present position. Mr. Hoy's philosophy has played a significant role in the exploration projects of this company over the years, but what is more important, the officers, directors, and controlling interests in Banner have been aggressive in their search for ore reserves.

Banner Mining Company was incorporated in September, 1935, with a capitalization of 250,000 shares of $1.00 par value by a group of Oklahoma

and Texas oil men for the purpose of exploring and developing the Bonney-Manilla Mines at Lordsburg, New Mexico, and bringing them into production. The New Mexico properties had a previous history of intermittent production since the first ore discoveries as far back as 1870. Several small companies worked these mines for short intervals by sorting the relatively low grade crude ores and shipping them directly to a smelter. Each earlier attempt at operating eventually came to a halt during prolonged periods of depression in copper prices. Small gold and silver values in the upper portions of the mines helped to prolong such endeavors.

The Lordsburg Mining District, in which these mines are situated, is near Lordsburg, New Mexico and is located close to the southwest corner of the State about 50 miles north of the Mexican border. The region is arid and plant life is limited to mesquite and several varieties of cacti.

Most of the mineralization of this district is associated with a granodiorite stock which was intruded into the basalt flows in Cretaceous or early Tertiary time. Faulting probably began shortly thereafter and the fault fissures became the avenues for the vein type ore deposits of the area. It will be noted on Slide #2 that the veins carrying the major ore reserves of the district are arranged generally near the outer fringes of the granodiorite stock.

The exposed rocks of the Lordsburg District consist mainly of basalt, granodiorite and rhyolite, with smaller amounts of felsite and quartz latite in the form of dikes. The oldest rocks are the basalt flows of lower cretaceous age which are at least 2000 feet thick, as evidenced by underground workings in the Eighty-five and Bonney Mines. The outcrops of the granodiorite stock are very irregular and are roughly semicircular in shape.

The mineralized faults of the district fall roughly into two sets, one trending eastward and the other northeastward. They seem to be confined largely to zones that follow the general outline of the stock. A few faults either barren or almost barren of mineral content offset the veins slightly.

Most of the production from the district has come from four mines, namely, the Eighty-Five, the Atwood, the Bonney-Manilla, and the Misers Chest. The latter two are now owned by Banner Mining Company.

The Eighty-Five Mine operated between 1885 and 1931 and produced from a quartz vein almost entirely within the granodiorite stock. Production totalled 1,494,287 tons averaging 0.11 ounces of gold per ton, 1.23 ounces of silver per ton, and 2.80% copper. The vein extended for a distance of about 3000 feet in a NE-SW direction and was mined to a depth of 1650 feet. The vein entered a basalt flow rock at its southern extremity and only a small production came from the portion within the basalt. This gave rise to a notion at the time that basalt was not a good host rock, probably because the basalt was considered soft and incompetent, and not subject to intense fracturing. The vein filling was highly siliceous and for the most part was shipped as a flux to the Calumet and Arizona Company's smelter at Douglas, Arizona.

The Atwood mine adjoining the Eighty-Five mine on the north and east to date has been of lesser importance as a producer, but has been operating recently for several years producing high silica flux ores for a smelter. The several veins of this mine are also mainly within the granodiorite stock. Production totalled 352,828 tons up to January 1, 1962.

The Bonney-Manilla and Misers Chest mines owned by Banner are located entirely within the basalt rocks. Production to January 1, 1962, totals 2,006,343 tons with an average grade as mined of .0192 ounces of

gold per ton, 0.760 ounces of silver per ton, and 2.63% copper.

Banner built a 150 ton per day flotation mill in 1936 after almost a year of development on the 600 level of the Bonney Mine. After less than one year's operation at the above rate it became apparent that the mine would support a larger mill, and that the 150 ton per day rate was not sufficient to make a reasonable profit on account of the marginal grade ores. A 300 ton per day unit was added to the mill in 1937, and is still the operating unit today. An article appearing in a Denver news column at the time our mill was being constructed stated that certain Oklahoma oilmen would be sadder and wiser after attempting to operate the Bonney Mine.

The low tenor of the ore made mandatory the close control of costs in order to make ends meet. The clean sulphides gave us no problems in milling. A metallurgist doing research on it at the time stated that the copper minerals seemed to have a built-in desire to float. Our mill recovery on copper throughout the 27 years of operation has averaged 96.23%.

Developed length along the Bonney vein in 1935 was about 700 feet. Its greatest depth at the time was 600 feet. Subsequent development by Banner increased the mining length to 2800 feet by working out the segmented nature of the vein which had minor offsets throughout its entire length. The veins have a dip averaging about 70 degrees and an average thickness of about 6 feet. Depth of the mine workings in 1962 was 1760 feet. All stoping has been done by the shrinkage method.

The ore, in general, consists mainly of chalcopyrite in a highly siliceous gangue. Some chalcocite was found as coating on the chalcopyrite in the enriched zone between the 800 and 1000 foot levels. Small amounts of galena and sphalerite are noted in the north portions of the vein. Some evidence of low grade disseminated copper in the granodiorite has been

noted in a few isolated areas on the lower levels of the Bonney Mine where we have made contact with the granodiorite stock.

The war years of 1941 through 1945 brought many hardships to our company. Labor and supply shortages caused drastic curtailment in development work. Rapidly rising costs far outdistanced any relief from pegged prices which we received from Government agencies.

Finally, a branch of the Government asked us to stop all development work and produce from proven reserves. We were glad to comply, but it meant running completely out of developed ore in 1945. At this time Banner faced a real dilemma.

Our cash reserves were at a low ebb and this situation, coupled with the complete exhaustion of our developed reserves, made the problem seem almost hopeless.

It was very apparent that we had to do two things, all within our limited means if Banner was to remain alive: (1) We had to develop ore very rapidly at our mine in New Mexico, and (2) explore for other mines should our development program be unproductive.

The first step was to purchase the claims of the adjoining Misers Chest Mining Company under a long term lease and option. This mine had limited production in the past amounting to less than 15,000 tons with a total copper content of 874,333 pounds, all of which came from above the 500 level through a small 2 compartment incline shaft.

A small tonnage for our mill was started from development headings on the 400 and 500 levels of the Misers Chest Mine. At the same time, we located a diamond drill on the 900 level of the Bonney Mine to drill a long flat hole to intersect the Misers Chest vein. This first hole cut the vein at a depth of about 1000 feet and showed values equivalent to those

previously found in the Bonney Mine.

We then started the long crosscut to the Misers Chest vein. This was a major project for Banner at the time and required over a year to complete. Drifting on the 900 level of this mine finally proved an ore shoot 1500 feet in length. Several small segments of other veins which did not outcrop were also cut in the crosscut. Two of these intermediate veins eventually developed stoping lengths of 400 and 700 feet, respectively.

The good results in finding milling ore in the Misers Chest mine relieved our situation greatly. However, it was felt that we should continue our search in a small way to find other prospects which might develop further ore reserves within range of a few hundred miles of our New Mexico property as an insurance measure to assure Banner's continued existence.

As a small concern we could not afford any elaborate plans in new areas, so as a consequence, we were confined to locations near old mines and possible extensions of them. Therefore, it was necessary for us to determine within what limits or zones the old mines had worked in order to get clues for further exploration. In other words - in what headings or along which fault zones or veins did they carry out their work and also why they did not extend the mines into adjoining areas or open levels at a greater depth, and finally, did the previous operator leave any unmined ore.

Generally, in most mining districts certain faults, veins, and structures get the most attention because of obvious mineralization. Other geologic structures with less apparent possibilities are not explored (at least for a time) and as a result, acquire locally the reputation of below average prospects. The exploration philosophy of Banner has been to test beyond the obvious and to question any opinions reached in the past which tended to limit the possibilities of any mine, vein or structure.

Our search began close to the home operation at Lordsburg, New Mexico, with practically nil results and as a consequence gradually fanned out into Arizona and Northern New Mexico. My attention was called to the Twin Buttes Area about 25 miles south of Tucson, Arizona, in 1949 by W. L. Allison of Phoenix, who held a lease and option on the Senator Morgan, Copper Queen, Copper Glance, Copper King, and Minnie Mines, which had a history going back to 1890 when some of the first claims had been located, but had been idle since 1921.

Production from these four mines up to 1950 totalled some 400,000 tons averaging over 6% copper with a valuation of almost $10,000,000.00 at an average price of copper of 13 cents. Almost all of this amount was mined before 1921 and came from small shafts of 2 compartments or less

Apparently the high grade ores gave rise to some handsome profits, as I am told that monthly dividends were paid to stockholders. Another evidence of the high return from the mines was the railroad build in 1906 by the Twin Buttes Mining & Smelting Company, from Tucson to the mines - a distance of about 25 miles. An old dilapidated railroad coach and engine tender still may be seen near the Glance Mine. It is my understanding that the monthly dividends were paid stockholders without regard to possible future cash requirements. The thought being to get high benefits as quickly as possible and to meet future needs by assessing the owners of stock. However, when the need arrived, most of the developed orehad been mined and no one wished to contribute, as metal prices were then very low. An end to a fabulous era had arrived.

Indications were that the old mine workings did not extend very far from the shafts, as a maximum of only 100,000 tons of ore had been produced from any one mine.

Several of the mines were located along an east-west fault on or near the contact between limestone and igneous rocks. This central zone could be traced almost two miles with minor offsets and apparently extended out under the deep valley fill to the east. Considerable lengths along the zone were still unexplored and the possibilities were that other high grade deposits might be found along the fault. In any event we felt that these mines had a potential for future production from undeveloped areas.

On account of the varied ownership of the mining claims in the Twin Buttes District, it was exceedingly difficult to tie up a compact group of claims and required almost two years of persistent negotiations to acquire by lease and option the central nucleus of claims on terms that we could afford. During the negotiations on the Twin Buttes Area our attention was focused on the old Mineral Hill Mine about 7 miles to the north, by William E. Foy, one of the early operators in the district. It seemed particularly attractive to us because the old records estimated that about 500,000 tons of copper ore had been developed underground by the Mineral Hill Consolidated Mining Company, a subsidiary of the Barnsdall Oil Company in the period 1914 to 1921. The Mineral Hill Company was proceeding with plans for a mill in 1920 to handle the developed reserves when the new management in Barnsdall Oil Company suddenly decided to drop all mining. Sharp decreases in the price of copper also was a contributing factor.

Negotiations in Idaho with the leaseholders and owners in 1950 brought the 38 patented Mineral Hill claims under Banner control in October of that year on a long term lease and option agreement with extremely favorable terms requiring practically no cash and a 10% royalty on production.

The serious foreign situation in Korea in 1950 prompted the Government to make exploration loans for likely projects to increase reserves

of strategic metals. Two projects were applied for by Banner - one on the Mineral Hill Mine, and the other on the Copper Glance Mine at Twin Buttes. The total costs of the projects came to about $250,000.00, almost evenly divided between the two mines, with the costs being equally shared between the Government and Banner. The purposes of the project were to unwater and rehabilitate certain portions of the two mines, to sample any unmined reserves, and to do underground diamond drilling to locate and increase ore reserves. These contracts were signed on June 30, 1951, in Washington, D.C. with initial work to begin as soon as possible. Banner's cash position in 1950 was extremely grave and to make matters worse the contracts provided that Banner was to advance all the capital for the work each month, one half of which would be later reimbursed by the Government agency.

The little property at Lordsburg, New Mexico had to produce enough profits to meet these capital requirements. It seemed an insurmountable task and I can assure you that many sleepless nights were spent contemplating just how we were to meet the demands of ensuing days. To say that we worried through the situation is an understatment indeed.

Two years of exploration and rehabilitation work completed the two Defense Minerals Exploration Administration projects. The 500,000 tons of low grade milling ore reported by the old records of the Mineral Hill mine were indeed in place and would provide an initial location to begin some production. Our work on the copper Glance Mine was not so blessed. Only 4000 tons of direct shipping ores were located and eventually shipped. However, it averaged a healthy 4.95% copper. This first limited work at the Glance Mine was very disheartening, but we still felt the area had merit, so we held on to the claims.

Need for copper in the Korean War effort enabled us to make a contract in May, 1953, with the Defense Minerals Production Administration furnishing most of the capital to build a 300 ton per day mill and to equip and develop the Mineral Hill Mine for production. Total cost of the project was to be $563,665.00, of which Banner would furnish $90,000.00 over a 12 month period. We were to produce 12,960,000 pounds of copper for the Government stockpile over a 3 year period commencing in May of 1954 at a price of 31¢ per pound. The owners of the property cooperated by cutting the royalty rate in half to meet the Government insistence on the 31 cent price.

At this stage in the history of Banner, the owner of its majority stock interest passed away and control was purchased by Utah and Texas individuals and companies. Also about 145,000 shares of capital stock were sold to present stockholders and another Salt Lake firm to enable Banner to meet its share of the production contract costs and to commence a minor drilling program in both the Mineral Hill and Twin Buttes areas during 1953 and 1954.

Some of the patented claims on the east boundary of the Mineral Hill property had visible low grade outcrops of copper mineralization in narrow widths up to about 5 feet in garnetized zones in limestone (Permian). However, most of the area was covered with alluvium from 10 to 200 feet thick. Several scattered shallow surface workings had been mined in the past down to maximum depths of 200 feet through open stopes from the surface and several very small single compartment shafts. It is estimated that not more than 5000 tons of ore could have been mined from all of these openings.

A slag dump near the collar of the deepest inclined shaft contained

about 2000 tons of slag and gave evidence of early attempts, possible around 1916, to recover the copper in the ores extracted from the small mine openings nearby.

In the outcrops, shallow workings and scattered spots of bedrock apparent in gullies and ravines, low grade mineralization could be seen at intervals for a distance of over 2000 feet north of the Daisy claim where the outcrops disappeared under the valley fill.

We felt that these mineralized showings in the Daisy vicinity and those claims now under our control to the north and northeast merited further exploration work to increase the meager geologic information then available. In January, 1953, a magnetic survey and a limited amount of self-potential work were undertaken by contract with the Sherwin F. Kelly geophysical services.

The magnetic survey completed in April of 1953 indicated a large anomaly up to 800 feet in width, beginning at the eastern edge of our property and trending northwesterly for a distance of some 3300 feet. This anomaly was offset slightly in several places, indicating possible faults below the alluvial cover.

Diamond drilling had been underway by Banner near our east boundary just prior to commencing the geophysical survey and entered a 42 foot intercept of chalcopyrite ore averaging 5.20% copper at a depth of 337 feet. This drill hole also showed a 150 foot thickness of alluvium above the bedrock. The self potential survey, completed during the drilling, did not show the presence of this orebody. However, the magnetic readings when completed, did indicate it on account of the associated magnetite. The ore in this hole was later to be part of our Daisy Mine. This large magnetic anomaly and drill hole ore discovery prompted us to locate many additional

claims to the north, northwest, and northeast, and to increase the mill plans from 300 to 400 tons per day.

Several other drill holes were put down to test the magnetic anomaly in the vicinity of what is now the Daisy Mine and to the north.

The holes to the north passed through low grade mineralization in garnetized limestone rocks and bottomed in a quartz monzonite porphyry. This porphyry contained pyrite and minor amounts of chalcopyrite and molybdenite, all considerably below ore grade even for open pit mines.

Several holes further north passed into this mineralized porphyry at shallower depths, thus indicating a southward dip. Later information has proven that our Daisy mine workings are located in the hangingwall sediments above this porphyry.

A drill hole on the Daisy claim some 900 feet westerly from the original discovery hole was commenced in July of 1953 and passed through 10 feet of alluvium, 25 feet of altered limestone, and then into 65 feet of oxidized copper ore averaging about 4%.

This drill hole was to become the location of a small two compartment shaft to check the information in the drill hole down to a depth of 100 feet. The ore found there was in mineable widths and of excellent grade. In the interest of conserving funds, it was decided to extend this small shaft to 400 feet, rather than sink a new and larger shaft to develop and mine the ore zone. It was given the name of Daisy after the claim of which it was situated.

The Mineral Hill mill was completed in May of 1954 and began producing from Mineral Hill ores. Development sulphide ores from the Daisy mine contributed substantial amounts of additional excellent ore to our mill. During this period we also began shipment of direct smelting

oxidized ores to a smelter at the rate of 1,000 tons per month.

Development and exploration successes in the Mineral Hill-Daisy area again heightened our opinions of the mineral possibilities in our Twin Buttes claims 7 miles to the south and we began acquiring adjoining claims mainly by location and other by lease and option, until we held a compact area of almost seven square miles in extent, including and surrounding the old producing mines.

A continuous persistent mining and development program was carried out in the Daisy Mine within the limits of the single hoisting compartment shaft with good results from late 1953 to late 1959. In this interval a grand total of 467,719 tons of ore averaging 3.41% copper were taken from the mine. Of this total 43,868 tons of oxidized ores averaging 5.67% copper were shipped directly to a smelter. Besides this production we developed known indicated sulphide reserves in the mine totalling 3,943,000 tons averaging in excess of 1.50% copper. Further substantial sulphide reserves may be expected laterally and at greater depth in the Daisy Mine area. About 45% of the sulphide reserve is presently being mined and milled for us by the Pima Mining Company under contract. 3,225,000 tons of oxidized material in calcareous gangue averaging about 1% copper had also been drilled out within a portion of the magnetic anomaly. Several times this amount of oxidized material is indicated by the extent of the anomaly. Concentrating these low grade oxidized ores in a limestone gangue has been an unsolved metallurgical problem to the industry for many years.

In the fall of 1955 and early 1956 on the strength of our good results and information in the Daisy area, we decided to put down several more or less wildcat assessment holes about a mile to the northeast. The

first of these were shallow holes and passed through 200 feet of alluvium and encountered only slight mineralization in limestone. In February 1956 one of these holes entered low grade disseminated ore in graywacke at a depth of 365 feet which continued for an intercept of 335 feet. This was our discovery hole in this new area on the Eisenhower group of claims. It seemed evident to us that the disseminated ore in this particular hole had ample thickness to be part of a larger body. We then planned to enlarge upon the (find?) by developing outward from it with other drill holes and by deepening some of the early shallow holes to the ore zone.

Subsequent intermittent drilling of 64 holes on an equalateral triangle pattern 250 feet on a side and totalling about 70,000 feet on this Eisenhower group of claims in the years 1956 through 1961 has indicated ore reserves of some 68,000,000 tons. In addition, it is estimated that 103,000,000 tons of low grade acid leachable material averaging about 0.28% copper would be mined in taking out the above reserve by open pit methods.

In 1956 magnetic and electromagnetic surveys were also conducted over portions of our Twin Buttes claims which located several strong anomalies. One of the largest was over the east extension of the Copper Glance mine fault zone. Several initial drill holes in close proximity to the Copper Glance shaft were put down to test the anomaly, all of which passed through a strong sulphide zone containing pyrite and chalcopyrite at or just above the contact between tactite and what previously was thought to be unmineralized granite. One or two of these drill holes were extended into this so called granite about 100 feet in disseminated sulphide copper mineralization varying between 0.5% and 1% copper. We felt at the time that this was a very significant discovery, but our drilling was far from being extensive enough to make any claim of possible

porphyry type copper. Subsequent drilling and study by ourselves and others has proven that this porphyritic granite is intrusive and possibly Tertiary in age. Also, recent drilling has shown the existence of a mineralized quartz monzonite porphyry, armlike in shape at bedrock extending easterly through our property for 2 or more miles.

Bedrock geology around the quartz monzonite prophyry disclosed a contact with limestone adjacent to the porphyry on three sides. A few drill holes have disclosed substantial thickness of strong mineralization in a wide strip adjoining the porphyry. Please note the striking similarity of the location of this mineralization surrounding the porphyry here and that of the Daisy-Eisenhower area.

High copper prices in 1955 and 1956 prompted us to extend the 525 foot level of the Glance Mine eastward out under the electromagnetic anomaly. This drift was driven along the fault contact between the limestone and the granite porphyry. Nine hundred feet of the eastern-most part of the drift was in ore averaging about 1.5% copper and contained heavy pyrite in a gangue of quartz, altered limestone and chlorite. Sharp drops in metal prices in late 1956 and 1957 forced us to stop this work. In 1958 we located a diamond drill hole for assessment work to intersect the above ore zone 750 feet easterly from the underground drift face. This hole passed through 210 feet of alluvium and on into oxidized copper mineralization at bedrock. An intercept of about 250 feet of low grade oxidized and sulphide copper mineralization in garnetized limestone was encountered in the hole.

In April of 1961 we commenced another assessment drill hole about 1600 feet from the one just mentioned. The overburden was thicker here, but so was the mineralization.

Considerable other shallow drilling over a broad area through the alluvium into both the quartz monzonite porphyry and metamorphosed limestone has disclosed widespread mineralization. The drilling to date is far from conclusive but it certainly is enough to create an opinion that considerable future attention is justified, including substantial amounts of exploratory drilling.

The extensive drilling program carried out on the Eisenhower group of claims near Mineral Hill located a tactite zone near the bottom of the mineralized section and just above the contact with the white marbleized limestone. This zone contained ore considerably higher in grade than the average of the large disseminated orebody and apparently persisted, as indicated by the drilling over a wide area. This garnet-tactite horizon was, for the most part, below the depth to which any open pit might reach in the next decade. To this thinking was added the fact that the financing of an open pit mine, accompanying mill, and other facilities, could reach an astounding figure to us, of $40,000,000.00 or more. The financing of such an amount could be very difficult for a small company such as ours. Our conclusions, then, in early 1959 were to sink the Palo Verde shaft to a depth of 1320 feet to tap and develop and mine at least a portion of the higher grade ores as an intermediate step in planning for the overall orebody. Several million tons of the better ores were available for underground mining.

The shaft as planned contained five compartments with steel sets - two compartments for skips, one large cage compartment, a manway, and one for cables, pipes, and cage counterweight. The skip hoist has a hoisting capacity of up to 3000 tons per day.

Prior to sinking we drilled a large diameter well about 30 feet from the proposed shaft and installed a high capacity deep well pump to

unwater ahead of shaft sinking.

The sinking of the shaft under contract to Centennial Development Company went very well, even though the water level in the adjacent hundred feet above shaft bottom without significant leakage into the shaft. At a depth of 960 feet we drilled into a large cavity, and water rushed into the shaft, covering mucking machine and other equipment, and finally rising almost to the 700 level.

We were the better part of a year in controlling the inflow and dewatering the shaft. Production started on a limited basis in November, 1961. 408,523 tons of ore, taken from development headings and stopes, were mined up to January 1, 1963, and averaged about 2.25% copper. All of the above was milled in our expanded Mineral Hill mill which now had a rated capacity of between 800 and 1000 tons per day.

From time to time since 1949 I have made periodic visits to the Helvetia Mining District about 20 miles south of Tucson in the Santa Rita mountains and have each time come away impressed with the wide-spread copper mineralization found there. The highly complex geological structures of this district, plus the metallurgical problem created by the only known reserves of mixed oxides and sulphide type ores in a calcareous gangue have been deterrents to major exploration projects in the past. Also in some portions of this district mineralization is apparently bottomed on a fault plane separating the Pre-Cambrian (?) granite from later sedimentary rocks thus giving rise to the thought that possibly little enriched primary sulphide ores would be found within the shallow zone down to the Pre-Cambrian (?) granite.

We concluded in 1960 that the wide-spread copper showings covering parts of several square miles could have downward extensions

somewhere in the vicinity and were willing to expend a considerable sum on exploratory work to prove or disprove our theories.

Negotiations were startedwith the several owners and after a year of intermittent meetings, four basic agreements were concluded in May of 1961, which tied up the properties in question, involving several hundred claims under certain conditions for periods up to 24 years.

The Helvetia District is situated in the northern portion of the Santa Rita mountains in Pima County, Arizona, approximately 20 miles southeast of Tucson. The district covers almost 90 square miles, being about 12 miles north and south and 7 miles from east to west. The district's principal mining camp was called Helvetia and is accessible from Tucson by way of Sahuarita, Arizona, 18 miles south on a paved highway and then 14 miles east over a graded dirt road.

The topography is generally extremely rough and vegetation is very sparse. Altitudes range from 4500 to over 6000 with serrated mountain ridges being dominant topographic features. Steep rugged slopes on the west drain toward the Santa Cruz river valley, while the eastern slopes are much gentler.

Copper ore was probably discovered in the district before the Civil War, but records available only go back to the late 1870's when the Old Dick, Tallyho, and Heavyweight mines were prospected. Much of the early production of copper came during the period 1900 to 1910, from operations of the Tip Top Mining Company and the Helvetia Copper Company.

Production has been intermittent since that period. During both World Wars there was considerable mining activity in the district and the latest production (1957) was from the King-Exile mining operation of the Lewisohn Copper Corporation. This company also did extensive drilling and exploration in this period.

There have been over 50 individual mines and prospects operated in the district at one time or another, but metal production was, unfortunately, not recorded for all of them. However, it is estimated that total production exceeded 20,000,000 pounds of copper with lesser amounts of lead, zinc silver, gold and molybdenum. Total combined values probably approached $5,000,000.00.

The Santa Rita and Patagonia mountains together form an almost continuous chain, extending northward from old Mexico for a distance of 45 miles. Igneous rocks make up the greatest share of the southern two thirds of these mountains.

Occupying the northern third of this mountain range is the Helvetia Mining District which has a large exposure of sedimentary rocks, including both Paleozoic and Mesozoic. In addition there are moderate amounts of granite, granite-porphyry (Mesozoic) and quartz monzonite porphyry (Tertiary).

Tilting and broad open folds characterize the structure in the southern Santa Rita -Patagonia mountains. However, in the Helvetia District extensive thrust faulting and accompanying deformation have created a highly complex situation including folds and overturning.

Our work in the district so far has been mainly diamond drilling, road building, surveying, and the setting up of a triangulation system for survey control. Results are incomplete now and will not be reported in this paper, but it is our intention to keep probing for answers to the geologic problems.

In the Mineral Hill, Twin Buttes, and Helvetia Mining Districts of Pima County, Arizona, our exploration drilling program totalling about 300,000 feet has disclosed fairly large tonnages of oxidized copper ores in a limestone or limestone derivative gangue containing as high as 30%

calcium and/or magnesium carbonates. We have also noted that this type of ore is quite abundant in several other mining districts of the west.

The quantity of this type of ore in the areas controlled by Banner that are so far drilled indicated amounts of many millions of tons. For our own ore alone, it is apparent that some research should be attempted with the thought of finding a method of recovering the contained copper. These ores contained the following copper minerals: Malaconite, Tenorite, Cuprite, Azurite, Malachite, and substantial amounts of Chrysocolla.

Obviously, acid leaching of these limey ores is uneconomical on account of the fact that the acid reacts with the carbonates and largely exhausts itself before combining with the copper. In any event, the large amount of acid required to neutralize the carbonates would make the procedure highly unprofitable.

In the past, these low grade oxidized ores have been considered as waste unless they were near a smelter and needed as a flux. Their low grade precluded any long hauls.

Four years of research work in the laboratory and a batch type pilot plant have brought forth data which resulted in our obtaining several basic patents and also improvement patent applications in both the United States and in foreign countries. These processes may or may not be the ultimate answer for this type of ore, but we are convinced that it is a start in the right direction. I will not attempt to go into details of the process because of the time required, but some of the highlights will be touched on to outline the pertinent phases to you.

Our research indicates that several alkaline leaching reagents were very plausible and useful for leaching copper from our limey ores.

We selected sodium hydroxide as one of the alkaline reagents in our first test work, mainly because of (1) its strength, (2) its relatively ample supply, and (3) its relatively low cost.

In working out the problem inherent in the new process, we have utilized a little known property of copper which has largely been overlooked in the past. It is known that copper is amphoteric and is capable of reacting in solution as either an electro-positive ion, or an electro-negative ion.

We found that sodium hydroxide would react with most of the oxidized copper minerals and would form sodium cuprate ($Na_2Cu\ O_2$) a relatively stable compound in low temperature ranges up to 180 degrees Fahrenheit.

Sodium cuprate was isolated in our laboratory by ion exchange methods and subsequently purified by precipitation with ethyl alcohol. Its identity has been proven by spectrographic and analytical methods, our assays show that a purified content of copper in sodium cuprate contained 45% copper. The theoretical content in sodium cuprate is 44.89%. It is bluish green in color and is soluble up to 15 gms per liter in strong sodium hydroxide.

The sodium cuprate can be electrolyzed in a sodium hydroxide electrolyte. During the electrolysis cupric oxide, CuO, is precipitated at the cathode. The remaining Na_2O of the sodium cuprate reacts with water to form NaOH in solution. Therefore, in this electrolysis reaction, a sponge of copper oxide is produced and our leaching reagent, sodium hydroxide, is recovered for reuse in further leaching .

We have found that a static leach with sodium hydroxide is impractical because silica gel formed from the leaching of chrysocolla coats the mineral particles and halts further chemical reaction.

After many approaches to the problem, it was found that the crushed ore needed to be continuously moved while leaching to remove the silica gel and slimes in order for the leaching agent to penetrate further into the copper minerals. Our pilot mill leach practice involves the use of a rotary leach drum with an internal helix to advance the ore, which operates at about 1/3 RPM. Hot 17% NaOH solution enters the leach drum and flows counter current to the advancing ore. Leach drum efficiency is greatest on our ore at a peripheral speed of about 8 feet per minute and results in the formation of the least amount of slimes.

Studies over a period of about two years were made on the best size of ore particle to be fed into the leaching drum. It is commonly known that a chemical reaction which may take many hours to complete on coarse particles may be almost instantaneous on finely ground material. Our testing involved sizes from 3/8" mesh down to -325 mesh. The larger sizes took 96 hours or longer to leach in cold caustic and as little as 5 hours in heated reagent. The finest particles leached in 30 minutes or less in the hot caustic. However, many tests showed that particles of -65 mesh and smaller produces a slime in the leach drum which acts as an ion exchange media.

We have proven that slimes of this nature produced from an oxidized copper ore containing limestone from an oxidized copper ore containing limestone derivative gangues will absorb and hold the cuprate anion, CuO_2 from the pregnant leach solution.

On our ores, experience has proven that the best ore feed to the leach unit should be approximately 10 mesh in particle size and that the slimes must be removed continuously and as rapidly as possible from the pregnant solution, while being produced, to avoid the ion exchange

reaction which increases with longer contact time. Precoat rotary vacuum filtration has proven the best method of removing the slimes continuously and washing them to recover the caustic adhering thereto. The filtering of slimes and washing are both accomplished on the same precoat rotary filter, continuously.

The filtered, pregnant alkaline solution containing sodium hydroxide, sodium cuprate, and minor quantities of other metal impurities, as their sodium complexes is subjected to electrolysis at a temperature of 175 degrees F in an electrolytic cell operating at 2 to 3 volts and at approximately 75 amperes per square foot of cathode surface.

The sodium cuprate and the sodium complex impurities are decomposed during electrolysis to their corresponding oxides of the metals and precipitate at the cathode as a sponge. The copper sponge thus produced will run about 80% copper. Other impurities in the sponge are minor amounts of iron oxide, zinc oxide, and lead oxide.

The slurry of copper oxide sponge and barren electrolyte are removed from the bottom of the cone-shaped electolytic cell by means of a dewatering screw after which it is filtered and washed on a rotary vacuum filter with a string type discharge. This procedure dewaters the sponge and recovers the sodium hydroxide solution for reuse.

The dried sponge is melted in a crucible type furnace after the additions of a small amount of reducing agent, such as, coke breeze and silica at a temperature of between 2280 and 2300 degrees Fahrenheit. A fractional percentage of deoxidizing metal (copper magnesium alloy) is added to oxidize any further impurities in the molten pool.

The melt is cast into anodes, using an automatic skimmer, using a mold made of meehanite iron. These anodes as poured assay about

99.5% copper. The slag could carry small amounts of other valuable metals, such as zinc and lead. These anodes are then refined in a conventional electro-refining electrolytic cell using the series system. By this method we are able to obtain cathodes that assay 99.98% copper and are marketable electrolytic grade cathodes. Thus, we start with ore and finish with saleable copper cathodes.

From a material balance point of view, about 95% of the leaching reagent is recovered during alkaline electrolysis and concentration of all wash or weak caustic solutions by evaporators. The condensate from concentrating the weak solutions supplies soft water to the cycle. Seventy-five per cent of the leach feed leaves as sand tails, 15% as dry slimes, and 10% as water - NaOH soluble metals.

If mixed oxidized copper and sulphide copper ores must be treated, the sand tails from the leach drum plus the slimes from the filters are treated in a conventional flotation mill. We have found that up to 90% of the residual copper in our ores in the tails of a mixed ore can be recovered by flotation depending on the grade of the head sample.

In conclusion it may be said that Banner Mining Company has placed a very strong emphasis on exploration and research, perhaps quite beyond that which is considered prudent for a company of our size. However, we believe there can be no continued growth in mining without substantial ore reserves. We have followed the philosophy of Mr. Hoy together with his moderating ingredients of caution, knowledge, and judgment, and mixed well with extra amounts of persistence and plain good luck, and are now ready to look at the future with many unsolved problems, but at least from the height of a firm foundation of ore reserves.

ACKNOWLEDGMENTS

The production figures for the Lordsburg Mining District were obtained through the courtesy of the U.S. Bureau of Mines.

I acknowledge the highly valued assistance of F. D. MacKenzie, Chief Geologist, Guerdon Jackson, Project Engineer, B. W. Venable, General Mine Superintendent, and E. C. Brace, Chemical Engineer, in the preparation of this paper.

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1st

$1,030,000 135 days for season

Land 1,000,000 when agreement signed – 1st outside plant – loan to be repaid out of profits.

$1,000,000 for exploration and build mill.
~~2 years 4 years before plant completed.~~
Pull out any time
with 2,030,000 becomes notes payable to A. in start 1965 in 3 annual installs.

2nd

Joint venture by Banner

50% int.

Taken on partnership.

Need tight management on management

Loans repaid out of profits

4,000,000

(borrow 1,000,000 per year for four consec. years.) mortgage as guarantee

build mill, receive 1/2 of cost back in deprec.

3rd

Also joint venture

Notes on

Parkinson proposal

Pay $5,700,000 over

six years for

50% of property.

Banner would

expend 50% of

total investment (with

exploration, develop.)

at 75% of cost plus for

their part.

619 1247.5 TBA 14.

520 TBA 6D

SE

T. B. ± 1400

SECTION

2400 SE. 619 680 - 2178 1498 - 1.17

1498 x 400 = 599,200 ½ upper ½ lower

600,000

UPPER

2000 SE 648 - 189 0.93

608 646 1.67 1.557

10/14 629 245 1.5 ±

3 | 1050

350 1.4

350 x 950 = 332,500

LOWER

608 2077 - 3095

1018 x @ 0.78

200 x 0.78

2 | 1218

609 x 600 = 365,400

1600 SE

UPPER

624 0

616 153 @ 3.90 762

153 x 500 = 76,500

LOWER

624 168 @ ± 1.2

616 308 @ ± 1.2 1786

2 | 476

238 x 700 = 166,600

SE

TWIN BUTTES 10/14/63

1400 SE

UPPER

623 - 111 @ 0.58 1137

111 x 300 = 33,300

LOWER

623 - 896 @ ± 0.70 2366

896 x 400 = 358,400

TOTALS

UPPER

2400	300,000	1.17
2000	332,500	1.40
1600	76,500	3.90
1200	33,300	0.58
	742,300	

185,575 sq.ft. x 1600/12 =

1.5% 24,847,000 T.

LOWER

2400	300,000	1.17
2000	365,400	0.78
1600	166,600	1.20
1200	358,400	0.70
	4) 1190,400	
	297,600 sq ft x 1600	

0.8% 39,878,000

± 1.0% 64,725,000 T

HW TWIN BUTTES 10/14/63

400 SE 607 935 @ 0.67 1973

935 x 350 = 327,250 @ 0.67

200 SE 279 577 @ 0.9 1207

577 x 400 = 230,800 @ 0.90

LOWER 610 434 @ 0.73 2565

434 x 400 = 173,600

3A SE 188 820' @ 0.65 1507

609 285 @ 0.57 1095

1105

550

550 x 700 = 385,000 @ 0.63

200 NW ? None in 294

400 NW 606 810' @ 0.56 1454

810' x 400 = 324000 @ 0.56

800 NW 612 316 @ 0.54 1057

316 x 400 126,400 @ .54

NW T. B. 10/14/63

1200 NW

611 445' @ 0.68 1220

445 x 400 = 178,000 @ 0.68

---

400 SE	327,250	@ 0.67
BASE	385,000	0.63
400 NW	324,000	0.56
800 NW	126,400	0.54
1200 NW	178,000	0.68
	5) 1,340,650	
	268,130	@ 0.62

268,000 x $\frac{2000}{12}$ = 24,756,000 T
@ 0.62

if uniform width of 700' used
tonnage would be ± 38,000,000 T.

TOTAL 89,481,000 @ 0.85

PERRY

VANGUARD BeO.

VERINGTON LAND ✓

McArthur. ✓

Anglin - Byrd. ✓

WILSON BLUEBELL ✓

Geo-phys. - Chilson. ✓

Polished surf work on Baum

To Wilson

Suggest deep drill hole in pit area while machine stopped at Ben area.

Langlands

Roysten

Ludwig.

Barber — Seal

Sept. 9 — Min. Materials.

Case — Bowtrell

3855.08
1698
2157.08

2940.55
2157.08
782.47
500.00

11.85
2.95
1.25
3.40
2.85
22.30

53.10
22.30
30.80
.15
.65

AIME Volume

NY Trip

Dec 3 - 6, 1963

Carr Fork: Suit:

Chev truck for Helvetia case OK.

McLaughlin - atomic blasting - investigate further - write letter

Flux ore:

Indium: OK for Thomson to visit.

Wilson: Raystone See what owners will do on deal.

Kaiser - Lathing. OK on their gas tax deal.

Bear drilling. - Land. - Perry will find out from Millers.

Possibly stop drilling if has not been tied up.

* Tintic District: Empire and Tin. Dev. agreements. ✓

; Small Cos. - Write assignments to CJP.

HUNT: Give his review on others

Letter to Holan did not discuss

Park City: 1300 L. of Silver King - have Gamma map

* Heela proposals - advised to be sure Heela has money, and do not throw away their drop tickets.

* Spors Mt. Continue drilling? Assayer. Send Perry Spors drilling map when completed

Patent claims, mill sites. establish CJP at T on drills if agreeable.

* Mt. Wheeler: OK to remove equipment. - Call Williams ✓ about equipment get release on transit

Barnes: Send Perry NW sections thru Palo Verde.

Drilling rates:

Carr Fork: New hole. In vicinity of DDH 12

Hall: Stop drilling when current program completed. OK.

Get Banner report ✓

Take ore reserves for

Sprg. Mt. —

Hale ✓

Banner - P.V., T.B., W. Helvetia ✓

Carr Fork ✓

Park City ✓

3/4 ton Truck for Helvetia

come

Take Banner sections

Plans - Tw Buttes, E. Helvetia

Bear section

Carr Fork sections

1. ACQUIRE LAND AS OUTLINED BY KNAEBEL

THRU AGENTS —

A. RANCH

B. SEPARATE SECTIONS

KNAEBEL WILL TALK TO MARLEY ABOUT 2 YR. OPTIONS ON STATE GRAZING LEASE GROUND

2. DISCUSS POSSIBLE ARRANGEMENTS WITH AS & R. DISCUSS WITH THEM, GENERAL TERMS,

A. TO FINANCE 15000 T. PLANT.

---

3. GET NECESSARY WATER SUPPLY

4. PATENT CLAIMS.

Upper high grade zone

DDHs 329 - 330

0.5% cut off

3,600,000 T @ 1.6%

Given to CMB 12/4/63

Conf. with Parkinson, PERRY. 12/6/63 DH

OK to resign as pres. of small Co, but remain as director.

Showed letter from Dugan about H. Complained of lack of "leadership" in SL area, and discussed L. Young. Told him Young needed experience, and that RBH was nothing to do with I S & R or Legal Dept. in manner of conducting operations.

Discussed Kenn. suit briefly — says legal ofc idea originated with Brinckerhoff & Perry. RBH stated again that we should not approve for limited purpose, let compensation be set by Court if necessary, and emphasize that if Kenn. has other purposes in suit, we do not know them.

He agrees that Spors drilling can be cut to one drill — have conf. with Dugan, Cornwall.

OK to purchase enough Boston-Apex stock to get 80% control — write letter on possible price, number of shares for approval. (6,000 shares @?

C S P continually emphasized that he wanted initiative taken in SLC on various matters with recommendations to NY for approval. (This largely contradicts former instructions that most affairs must be handled in NY)

Long with Perkins

11 – 11:45
9/23/63

Proceed with P. Perkins

Talk to ~~Sheidon~~ Snyder about Spore Mt – Searle
Dickman

Will arrange Bannon conf.

OK on Chaq – only reserve for Empire
any excess shaft capacity over 125-150 T/day.

Arrange interview on small coal.

Tucson 1/24/63

In 648 area.

Drill at 400' SW

Deepen 213, or drill new hole 400' SE on grid

Deepen 212 or drill " " on grid at 400' NE of 648

Drill 200' SW of 653

200' NW of 653

DRILL 400' NE of 632

Tentative hole 400' NW of 621

Drill 200' SW of 645

Tentative hole 200' SW of 649.

Drill 200' SW of 604 on 1600NW

Drill 200' SW of 613 after 200' SW of 604

Drill 200' SW of 248

Drill on 2800NW at 600' NE of 249 after one near 248

DRILL SW on Sect 400NW at 200' SW of 645 -50° 1600'

615

441 – 611
170' – 0.97T
0.88 ox.

608

911 — 1557	646'	1.64	1.47	
1567 — 2077	510	+ 0.3		
2077 — 2198	121	— 1.47		
2198 — 2443	245	— 0.72	— 0.058 Mo.	
2443 — 2640	197	± 0.35	± 0.06 Mo.	
2640 — 2888	248	± 0.8	± 0.04	
2888 — 2911	23	0.4 Cu	0.09 Mo	
3103				

646
121
245
248
1260'

1260
374
1056
2690
900

616

606 — 759	153'	3.90	(0.19)
759 — 1478	719'	± 0.30	
1478 — 1699	221'	1.44	0.068 Mo.
1756 — 86	30'	1.04	0.069

1843
well min
good Ls
spotty

374
40'

603

545 – 818'
273' – 0.91 T.
0.34 ox.

619

680 — 1336	656'	0.71	
1336 — 1736	400	2.02	± 0.05 Mo.

975-1087 112' 0.73 Cu 0.28 Mo

1056

2686
very low grade.

618.

1419 — 37	18	0.96	0.278 Mo
— 70		0.38	0.18
1525		0.36	0.069
1525 — 1580	55	1.58	0.020

1873+

623

856 — 969	113'	± 0.97T	0.8 ox. Cu
969 — 1178	209'	± 0.5	
1605 — 26	21'	1.73	0.052

2132'
Silicified Ls, siltstone
locally good.

624

1264

Into min Ls at 1179 – fault at 1080, again to 1179.

188 477 - 633 156' 0.71 T. 0.57 ox

700 — 1520 820' 0.65

SE. 607 638 - 1573 935' - 0.67 (457 - 638 181' 0.54 T 0.45 ox.)

NW 606 391 - 661 270' 0.59 T 0.42 ox.

661 - 1471 810 0.56

SW 609 534 - 741 207' 0.41 T 0.18 ox.

741 — 1141 400' 0.52

800' NW of 608 612 741 — 1057 316 Low 0.4+

(N) $\frac{1400 \times 600 \times 600}{12}$ = 42,000,000 T. ± 0.65 No?

(S) $\frac{1100 \times 700 \times 1000}{12}$ = 62,500,000 ± 1.2? 0.05? No.

(8/18/64) Discussed with Brinckerhoff 9/29/63 SLC airport.

RBH.

Varington

DDH 3

1929.9 - 2074.0

144.1 0.92

2074-88 0.15

610 855 - 961 106' - 1.05

2130 — 2565 434 ft — 0.73

961 - 2130 very low - 0.2

279 630 - 995 365' 0.75

995 - 1207 212 1.16

FORM 1168

MEMO

To RBH

Date 1/9/64 Time 10:30 AM.

Phone from Barber

To

Place

Subject Damnew, etc.

Present

Heiner - contacting Farmers -

owns

→ 25% of E. Petro group.

Robert 25% owner. with Chilson. Chilson does not want RBH to contact Heiner. Barber will see Chilson tomorrow.

Wilson - busy on Helvetia negotiation, Has not talked to Clark - will on Monday.

Apparently has not talked to Dorsel.

OK to proceed on Byrd - Angelo - Rene Garoe Thome next week.

	643	1362'	clastics - tuff & arkosic - some weak $CuFeS_2$ trace MoS_2	
NW	644	900'	alt. sil LS. ing Fe_2O_3 FeS_2 $CuFeS_2$ weak to fair ± 0.5	
NW	646	1119	f.g. sil. LS local Fe_2O_3 some good $CuFeS_2$	
(67	648	1031.5	strong Fe_2O_3 sil LS fair to good $CuFeS_2$ 0.5 +	
200' NE of 122.	651	413	alt q.m.	
E the	801	1985'	strong qzm. LS. tr. FeS_2 specks $CuFeS_2$ tr. MoS_2	
	803	485	LS f.g.	
	805	130'	alt arkosic	
←			other machine not yet arrived.	
	632	3377	strong. qzm. LS scattered FeS_2 little $CuFeS_2$ fair MoS_2.	
	635	3012	" 2928 - 3012 nearly white LS some qzm local fine $CuFeS_2$ 2nd bom overall weak	

640 stopped in q. mo. 1492.

637 1351' out of sil LS at 1299 : scattered mept.

1299 into gray white qtzite – oxidized.

1293–99 poor core recovery. could be fault.

641 1611' ~~1493~~ 1431 – 1611 siltstone with $CaSO_4$(?)

~~1493~~ – 1505 – 1611 mostly gypsum – anhydrite.

647 bar. 50. to SE between 631 + 619 into bedrock at 466'

to 540' in clastic rock – tuff? little Cu ox.

649 NW bar 56 685' in gray nearest LS – sep. little qtz. weak min

some dis. mept. but weak.

650 bar 51

~~between~~ in Qm ≈ 760' some fine sands below 696

760 – 835 f.g. tuff. [illegible] with [illegible] but not strong.

FORM 1168

MEMO

To Kelly

Phone from RBU

Place

Present

Date 1/3/64 Time 3:45

To

Subject Banner, Chilson, Wilson

Chilson – partner in SLC believes he has deal with cash payment to them – Chilson believes deal will fall through.

801 1834' coarse crsy LS, little $CuFeS_2$, bornite, at 1805

803 358 dactic rock – arkose

Rm. 7. 805 8' Longyear – next Longyear rig in ~~two~~ next week.

643 1253' fine crystals – in tuff. little FeS_2 $CuFeS_2$

800NW 644 782' NW massive gray. LS – good 777-79 $CuFeS_2$ born. some Cu_2S at 781'. Last 50' mixed ox + sulph. fine grade.

at Iron King Miles

400NW 645 1314' in horizons – will step down

400SE 646 890' mass brown gray. LS – mixed oxide, weak Cu.

? 648 724' Alt. sil LS. out of mag at 678'. little sulph. at bottom.

800SE 632 3170' Strong gray. LS 200-300 spotty, good $CuFeS_2$ MoS_2

1200SE 635 2727' " " " like 632, local good MoS_2, 2651-95 fair $CuFeS_2$ with ZnS, PbS, –

2695-2727 " " scattered FeS_2 little $CuFeS_2$ MoS_2 some

2400SE 633 2504 stopped in alt. silstone. – weak min.

1600SE 637 in gray with glassy qtz. 904' 904-1113 alt. sil gray + chlor. LS all oxide, local strong FeO_2

1113-1140 – fine gr. gray white qtzite.

DDH 640'
2800 SE

into qtzite 1232 - to 1304' then into silicious q. mo to 1410', local fair moly.

2000 S. 641 1402' light gray green silstone, locally brecciated some fine dis cu FeS_2 Fe_3O_4 FeS_2 - generally weak — local fair moly.

647 Ken. 80 450' in gravel.

648 " 61

649 " out of gravel at 301 — Ken L3 to 386 weak oxide mine

650 " 51 450 in gravels, then into to 503 in q mo. few qtz seams, local fair Cu oxides.

6/13/63

Rec 21 Drill

400' NW of 604

Rec 19 after 608 or 200 NE of R-19

Write Rec for 251

Drill 17 — if complyers position confirmed, drill

± 500' N (or more)

8/1/63

608 - Move to location 300' NE of 608

---

610 Move to ~~Rec. 14 ± 400 NW of 603 ± 400' SE of 615~~

~~Rec 400' NW of 611~~
~~Rec. 400' NW of 616~~

~~615~~

614 Stop, move to Loc. Rec 17 ±
~~700' SE of 142 600' SW of 610~~

---

521 Move to Rec at 700' SE of 142 and 600' SW of 610.

Keep 530 machine at Min Hill

Delay Rec 14 until strike in 615 determined.

BANNER RESERVES

Polygonal method. Based ± 11 cu ft / ton.

6/23/62 Eisenhower Group (St. Lease 248)

ORE 0.5% Cu cutoff — LOW GRADE 0.36-0.5 cutoff.

Polygonal method.

	45,523,895 T @	1.12%	
	289,905	2.27	
Prod.	45,233,990	1.12	18,678,801 @ 0.41%

combined ore and Low grade	63,912,791	0.91
Sack Horner	1,555,400	1.05
	65,468,191	0.91% Cu.

EAST TWIN BUTTES

6/6/62 0.5% Cu cut off - sulphide

4,216,684 T. @ 0.87% Cu

0.36 - 0.5% cut off - sulph

1,183,367 T @ 0.43

0.5% cut off (oxide)

4,973,142 T @ 0.88% Cu

0.36 - 0.5% cut off (oxide)

1,388,084 T. 0.41

Total Sulph ore	5,400,051	0.77% Cu
" oxide "	6,361,226	0.77

8/1/63

To Holdenred.

Send ½ split cores reject

603

607

188

606

Also oxide section 3 Nolan E. Helvetia

G 33, 34, 36.

START MAPPING HELVETIA W.

" DRILLING MUHEIN. – NW + SE of present area also NE and SW.

New Recs at Twin Buttes
Deepen 251

DRILL ANAMOLIES

Helmet Peak

Park Lot

South of Bianna dump

NW of Winnie.

Stop Deep PV. hole 523. – move to H.P. anamoly.

Move Inma drills to T.B.?

TWIN BUTTES 6/16/63

STOP 142 Move Mether rig to 291 ?

Prospect granite by deepening 251

Stop 605 - move to Rec. 18

Move 608 to Rec. 19. ?

" 607 to Rec 20 ?

Reserve Rec. 14 Change 17

15

13

6/16/63

NEW GRID TWIN BUTTES

N 40° E THRU 188

400' centers.

KNAEBEL

DRILL SUPT. (~~BICKFORD~~)? Pollish.
Surveying –

ASSAY OFFICE

DRILL SUPT. THATCHER.

Access. Work. Twin Buttes.
McKenzie attending to.
community of ownership.

Muhain.

RS on DDHS – Recommend 2 RS.
Pat. holes to be selected on
basis of operating conditions.
preferably low grade (0.6 – 0.7%)
#30 ft. – O.K. to limit
of feasibility.

ASSAYING

RBH did not approve sampling
of higher grade sections without proved.
Calculation

Sept. 26.

Hell Tuna Mine
[illegible]
Sept 9.

4/25/63

Check Drill holes

D 92 9035 129

450' apart

D 123 9475

check pulps - core & sludges.

Assays 50 samples per day.

DRILL

191. (188 machine)

211 (601 machine)

continue

142

196

DRILLING

142

188

196

601

RECOMMEND

New Hole 400 ft. NE of DDH 188

Deepen RDH 192

" DDH 248

" DDH 291

New hole 400 ft. NE of DDH 196

861	866	5.0	0.93	4.65
	71	5.0	1.06	5.30
	76	5.0	0.45	2.25
	81	5.0	0.77	3.85
	86.5	5.4	0.64	4.10

Call to Perry from S.L.C. 12:30 PM. 4/25/63

Huhein ✓

800
1500

Described drilling, 188 particularly.

Will send set of sections... color in SLC.

Assaying ✓

Will meet Knudsen Friday in SLC.

Check DDHs D 92 on section 9035

D 123 9475

Drill alongside, and re-assay pulps
then rejects ✓

Raise on DDHs - low grade (0.6-0.7%)
2 holes.

Thetaline - to go into 248 ✓

Baker - Thoms. ✓

Brinley leaving tomorrow night. also McAleer. ✓
Goddard gone ✓

May 7th Brinkerhoff

Look up Ivan at Yeington

From Tucson 4/25

AREA CODE 406

RBH — DAY ANACONDA LOGAN 3-5211

Discussed assaying — will investigate
Does not know of any available assayers.

4/29 Called S.L.C. — no assayers available

Can assay 600 samples during May if we wish

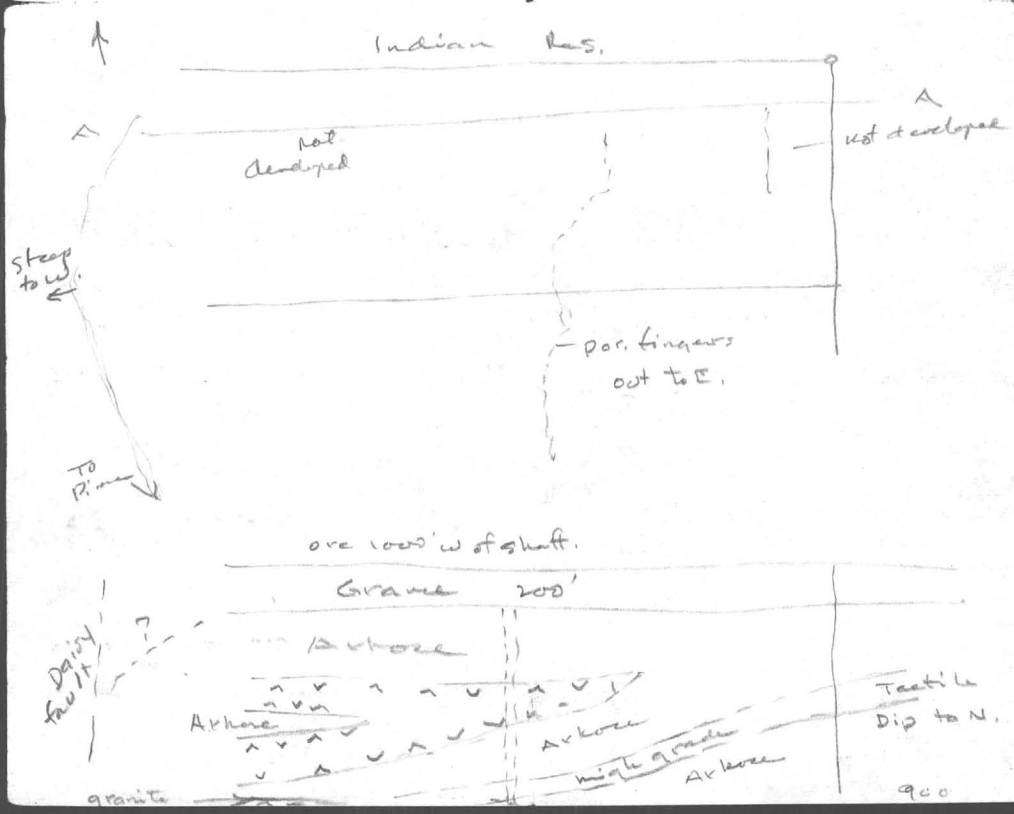
RBH will discuss with Knachel — no decision by JBK.

406
35211
LO

4/9/62

Sixth & Country Club Apts.
3033 E 6th
East 7-3461
Mr. Cone

Apts. available on daily basis for $10.00 to $12.00 / day; Complete with kitchen



Por dips to W
steeply at Daisy
fault
Beds dip to M.
Pine on HW
Baum on FW

Expect 95% rec.
now running thru
Min Hill mill.

Pine contract agreed upon
grade? rec. 92%

ASR agreed
strip on either side -
reimbursed by other
when ore mined. cost?

70,000 ft. drilling in 1961.

18 000 000 0.46
44 1.12

65-80 million at 0.90

36 cutoff 24,000,000 (42) 0.44
0.5 cutoff 57 1.05
some Mo, Ag, Au

70-80,000,000 capping
0.87

---

7 sect at TB
800' - 0.9 - 11000 ft
Mo? 0.02, line

45° pit
All on P.V.
group.

SL 81
5b'l
00'1
08'b

±7 sec at Helvetia
10 sec M.H.

Diana, Drilling - contracts - have
Knabee OK

Fringe area

Indian Ground - talk to tribe.
Filch will do

Keep Kittel. OK

Muheim. - Bowman will try;
start est. on pit one on
Banner information.

Continue claim adjustment at Helvetia.

Grame at Helvetia for plant site
24 Millsite claims x 5 a = 120 A.

Water RR, on new well on Hermit
Pk Grump.

Dallas 2/26 Isabelle Smith
Tel 359-8827

Put 4 drills on Aime area
4 " — Twin Butte,

T. BUTTES 3/2/63

Deepen 142

" 188

" 191

offset ASGR N. hole. - SE corner Jan 58 claim.

196

MIN. HILL 3/2/63

1. DRILL ON 9900N between
87 & 14

2. Drill on 7600N, 4400 E.

3. 6600 N 4800 E

4. 6200 N 4800 E.

Water height on well
on line between Sec 4 + 9
T 17S, R 13 E.

Work to be done on each lease
area $3200 / seat.

Drill

188, 196, 191,

142. 248 (both in q.
granite
1215.

Ellen - plan map of T. B. with
drill holes

Isabelle - copy of Perry letter on Mahian

BOWMAN PAPER DALLAS

3/27

PALO VERDE PRODUCTION

408,000 TONS @ 2.25% CU.

3/22/63

Delay R181 Wand 9035

R 180 ?

R 150 Drill

9255

Possibly between 91 + 133 9255

Possibly " 123 + 124

Drill R 177 — FIRST

107,935E

9695N.

follow to west

Drill (new)

107810 E

9915 follow to west.

Drill 164

108560

9915

Drill R 114 deepen

109555

9915 E

Drill R 146

109,400E

8815N

Kelly

Barker - Saginaw, etc

Pickens - P.V - Aimee drilling

Kittel Twin Buttes

Clark P.V. - Daisy

Mathias Core

Brinley Core

Erickson

Leigh
Goddard
McAleer

Thompson - ore reserve.

Garmoe P.V. - Daisy - Min. Hill

(13)

Surface - Helvetia.

Rupp ✓
McClane -
~~Hoat~~ Warbler ✓

Towle ✓
Thompson, Ariz

DDH 275 1240 - 1241.5 3/25/63

(pebble dike type, mineralized)

First part is dif. breccia with quartz fine $CuFeS_2$ bornite in specks and small bunches in groundmass - Williams thin section at 1241 apparently missed sulph - contaminated oxid. min.

3167 white qtz

3181.5

74 dark anxill.

3191

DRILL HOLES

	Hole No	
Sect 8815	89	1190
	245	1036
	189	1076
	98	994
	112	913
	84	826
	180	758
	263	1171
	298	650
	82	681
		9295

v000

Sect 9035	268	1220
	191	1137
	160	1146
	134	1130
	104	978
	92	987
	95	1030
	156	825
	175	730
	104	697
		9880

v000

Sect 9255	178	1217
	260	1223
	212	1146
	243	1151
	190	1059
	91	1001
	133	1081
	20	1040
	249	905
	252	865
		10,688

v000

JAN. 1, 1962

DAISY 2.8% cutoff sulph. 43,900T. @ 3.14 To 630 level.

	Cut off		% Cu
Ajax Pit area (mixed ox + Sulph.)	0.570	2,225,000	1.00
Copper King Twin Buttes Struct.	—	11,200	2.15
Daisy	0.70	2,147,400	1.55
Daisy Lower cone (Pima ext)	0.70	1,796,700	1.61
" Upper " Stripping - oxides	0.50	153,000	1.63
Eisenhower - Pedro Verde Hill	0.50	56,958,261	1.04
" Low grade	0.36-0.50	24,656,751	0.40
Eisenhower - P.V. - oxide	0.50	3,289,480	0.58
Glance Mine Twin Buttes		83,700	1.57
Helvetia (mixed)	0.40	13,799,000	0.84
J. Horner Group	0.50	1,555,400	1.05
Mine Hill		109,500	1.64
E. Twin Buttes oxides	0.50	4,828,342	0.88
" " " sulph	0.50	3,882,146	0.90
" " " oxide	.36 - 0.50	1,388,085	0.41
" " " sulph	.36 - 0.50	499,311	0.45

Pima County Res.

Total Sulph ore	66,533,016	1.07
" low grade Sulph	25,156,062	0.40
Total oxide ore	24,306,022	0.83
" low grade oxides	1,388,085	0.41
Grand Totals	117,383,185	0.87% Cu

7/6/62

A.	B. Joint Venture	P. Joint Venture
Exam. 135 Days	135 days all costs to Anaconda A. reports to Banner.	same
Pay $1,030,000 to repay D. loans. at end of exam. period.	1,030,000 to Banner, as part payment for properties loan if no j.v. formally created	Advance $500,000 at signing of option for 135 days. The advance 500,000 at end of 135 days.
Lend $1,000,000 at end of exam. period for oxide plant; to be repaid out of future sulphide profits.	Lend $1,000,000 end of exam. period + 500,000 during following year. for pilot plant oxide repay in three equal installment 1965 start if no J.V. entered; otherwise pay out of profits (75% of Banner share of cash flow) the $500,000 shall become part of jt.V. with Banner repaying $250,000 with interest.	Pay 1,000,000 annually to total of $6,000,000
EXPLOR. $1,000,000 over 2 year term	same	same
Plant: Build 15000 T/day By end of 4th year.	same at P.V.	Build 15,000 T/day plant.
Sideline agreement: Banner to secure	same	additional 90 days to negotiate with A S&R.
Operation: Banner continue until J.V. created	same	
	Property: Banner all property in Pima Co. title to plant at Min. Hill? J.V. assumes all property obligation.	Property payment + taxes.
Patent.	All free to J.V. from Banner and Anaconda. Anaconda. 500,000 yearly for develop. after 4 years.	same
	Loan 1,000,000 to B. at start of 2nd & 3rd year. and 4th year.	
	Repay from profits and Dep – Depl. at 50% of Banner share + 50% of Banner's ½ share of profits – (amounts to 75% of cash flow)	Repay to Anac. for plant by 75% of cash flow.
CANCEL: At any time with $2,030,000 becoming notes to be paid by Banner in 3 equal installments, starting 1965	No smelting Each party can dispose of its part of production. Anaconda operation control	

CJP 10/1/62

1,000,000 on loan 4 3/4% int for 1 year, for Pima Co. properties.

Extend to 1 1/2 yrs by paying $50,000 per month.

If continue on this basis, pay 1,000,000 per year for 3 years, increasing to minimum of $1,500,000 when commercial production started. (Sliding scale royalty 30¢ on 1%, 25¢ on 0.9%, downward to 10¢ on 0.7% with $1,500,000 min). Final payment not yet agreed upon.

Possible new deal would anticipate A. taking over all Pima property by cut right purchase with final price in neighborhood of $35,000,000.? Payments $1,000,000/year over period of time. Could take advantage of A. tax credits from outside U.S. RBH suggested lump sum payment of $15,000,000 after payments made on 1st three years, and that $35,000,000 value (900,000 shares at $40 ±) be reduced by value of Symmes holdings.

Talk CJP of Barman's statement that last hole at Helvetia hadn 100' ft. at bottom of 1% — or several hundred feet mined of, sulphide of ± 0.8%

Seat 9475

108	1249	
254	1335	
156	1227	
157	1101	
265	1075	
123	1169	
124	1088	
131	934	2000
251	911	
264	919	
	11,008	

Seat 9695

250	1086	
127	1157	
129	1100	
257	935	
262	1037	
266	881	
246	1075	1800
274	1278	
278	1230	
	9,779	

Seat 9910

15	1235	
267	1383	
185	1116	
242	1097	1000
248	817	
	5648	

56,298
− 10 800
45,498 ft. to log.

FORM 1168 6-8-54 5M

MEMO

To _____ Date 12/8/57 Time _____

Phone from _____ To _____

Place _____ Subject _____

Present _____

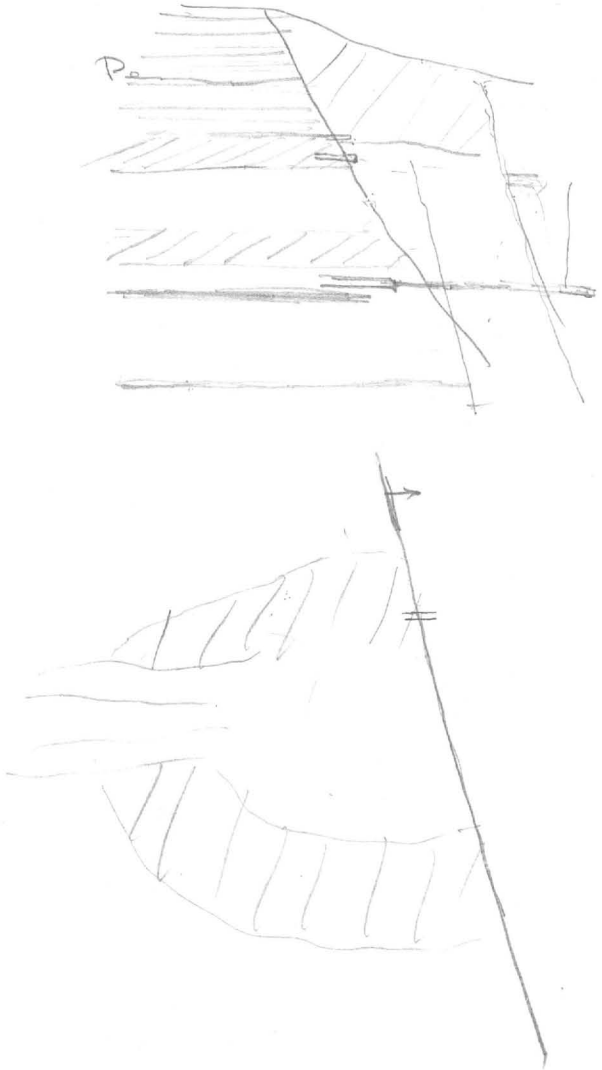
Talk with Lacey —

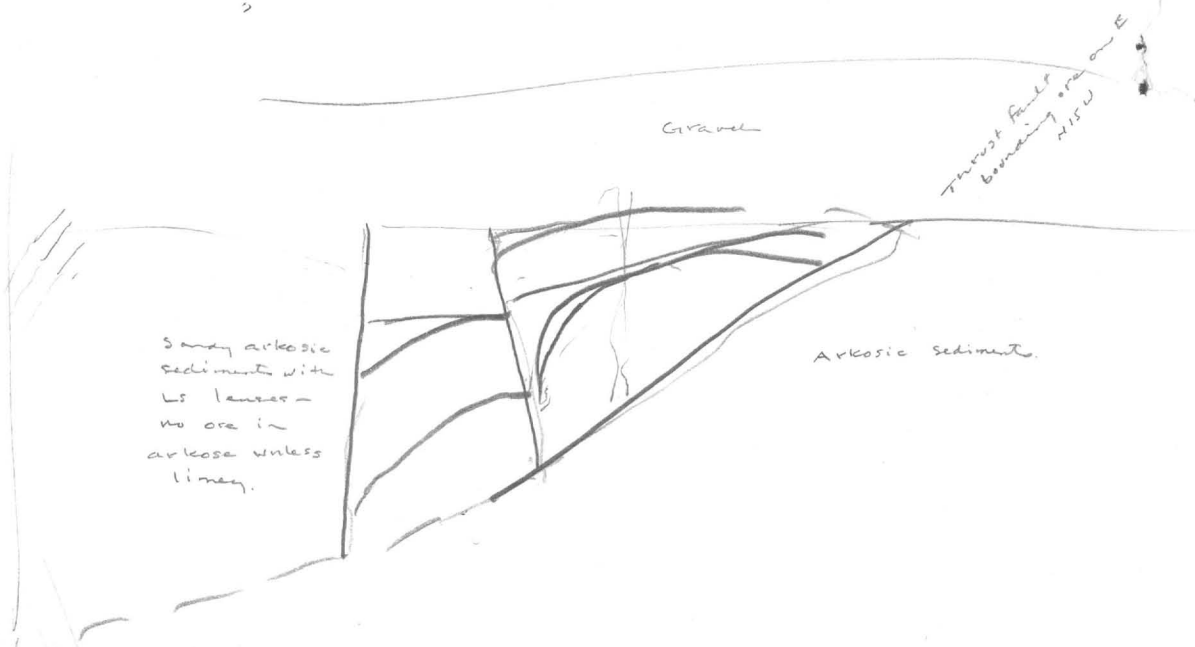
Granite at 1100 – 1200 depth below N. Pima, development; some qtz. mong. intrusive noted.

Work done by electro-Magnetics, specified would not work on purely dis. ores.

Is replacement of calcareous sediments interbedded with poorly mineralized qtzites. Cannot correlate well from hole to hole (as low as 200 ft.), possibly due to folding & faulting. Pima geo-physists missed because they did exploratory scout work with simple magnetics. Is direct continuation of Pima mineralized section. Lacey has not seen Pima geol. map.

Orig. holes drilled thru gravel showed poorly mineralized siliceous sediment, no ore; After geo-physical work done, Hart requested drilling of geo-physical anomaly to NW, and since then holes in one.





400–500' thicknesses of ore but much will average less than 40' bench (26 ft.

One hole in SE part of area 1 million T./acre.

Jones — Gus Lewis.

410 E. Mill St.

MISSION PROJECT

12/30/57

Hart + Lacy

PIMA AREA.

FORM 167 4-26-61 2M

OCT 7 1963

MINE WEST HELVETIA
Copper World Area
COUNTY Pima STATE Ariz.
REC. NO. 16

THE ANACONDA COMPANY

GEOLOGICAL DEPARTMENT

RECOMMENDATION FOR DEVELOPMENT WORK

To:

Description: Diamond drill a vertical hole at approximate coordinate location N. 314,100, E. 858,180.

Object: To prospect a geophysical anomaly covering a possible downward extension of mineralized limestone beds southeast of the Copper World Mine area.

Approximate Amount of Work 1000 ft.
Date of Recommendation October 3, 1963
Date Started
Date Finished
Results:

Recommended by J. A. Barker

Approved by Robert A. Murray

cc Mr. V. D. Perry
Mr. J. B. Knaebel

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Approximate Amount of Work 1000 ft.
Date of Recommendation October 3, 1963
Date Started
Date Finished
Results:

Recommended by F. A. Barber

Approved by Roland R. Murray

cc Mr. V. D. Perry
Mr. J. B. Knaebel

FORM 167 4-26-61 2M

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Date Started
Date Finished
Results:

Recommended by F. A. Barber

Approved by Roland D. Mackey

cc Mr. V. D. Perry
Mr. J. B. Knaebel

FORM 167 4-26-61 2M

OCT 7 1963

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Date Started
Date Finished
Results:

Recommended by F.A. Barber
Approved by Roland O. Muschany

cc Mr. V. D. Perry
Mr. J. B. Knaebel

FORM 167 4-26-61 2M

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Date of Recommendation October 3, 1963
Date Started
Date Finished
Results:

Recommended by J. A. Baker

Approved by Roland B. Mulchay

cc Mr. V. D. Perry
Mr. J. B. Knaebel

FORM 167 4-26-61 2M

OCT 7 1963

MINE WEST HELVETIA
Copper World Area
COUNTY Pima STATE Ariz.
REC. NO. 17

THE ANACONDA COMPANY

GEOLOGICAL DEPARTMENT

RECOMMENDATION FOR DEVELOPMENT WORK

To:

Description: Diamond drill a hole S. 60° W. at an inclination of minus 45° from a site at approximate coordinate location N. 313,730, E. 857,800.

Object: To prospect the downward extension of copper minerals exposed on the surface southeast of the Copper World Mine area.

Approximate Amount of Work 600 ft.
Date of Recommendation October 3, 1963
Date Started
Date Finished
Results:

Recommended by F. A. Barber

Approved by Roland B. Mulchay

cc Mr. V. D. Perry
Mr. J. B. Knaebel

FORM 167 4-26-61 2M

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COUNTY Pima STATE Ariz.
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Approximate Amount of Work 600 ft.
Date of Recommendation October 3, 1963
Date Started
Date Finished
Results:

Recommended by J. A. Barke

Approved by Robert B. Muckey

cc Mr. V. D. Perry
Mr. J. B. Knaebel

FORM 167 4-26-61 2M

OCT 7 1963

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Date of Recommendation October 3, 1963
Date Started
Date Finished
Results:

Recommended by F. A. Baker

Approved by Robert B. Moulthrop

cc Mr. V. D. Perry
Mr. J. B. Knaebel

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Date of Recommendation October 3, 1963
Date Started
Date Finished
Results:

Recommended by J. A. Barber

Approved by Robert A. Murchey

cc Mr. V. D. Perry
Mr. J. B. Knaebel

FORM 167 4-26-61 2M

OCT 7 1963

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Object: To prospect the downward extension of copper minerals exposed on the surface southeast of the Copper World Mine area.

Approximate Amount of Work 600 ft.
Date of Recommendation October 3, 1963
Date Started
Date Finished
Results:

Recommended by D. A. Barker

Approved by Roland B. Murchey

cc Mr. V. D. Perry
Mr. J. B. Knaebel

FORM 167 4-26-61 2M

OCT 7 1963

MINE WEST HELVETIA
Old Dick Mine Area
COUNTY Pima STATE Ariz.
REC. NO. 15

THE ANACONDA COMPANY

GEOLOGICAL DEPARTMENT

RECOMMENDATION FOR DEVELOPMENT WORK

To:

Description: Diamond drill a vertical hole at approximate coordinate location N. 314,150, E. 852,880.

Object: To prospect for possible mineralized sediments below Cretaceous clastics exposed northeast of the Old Dick Shaft.

Approximate Amount of Work 400 ft.
Date of Recommendation October 3, 1963
Date Started
Date Finished
Results:

Recommended by S. A. Barker

Approved by Robert B. Smithson

cc Mr. V. D. Perry
Mr. J. B. Knaebel

FORM 167 4-26-61 2M

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Date of Recommendation October 3, 1963
Date Started
Date Finished
Results:

Recommended by P. A. Baker

Approved by Robert B. Mueller

cc Mr. V. D. Perry
Mr. J. B. Knaebel

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Date Finished
Results:

Recommended by F. A. Barke
Approved by Robert B. Murray

cc Mr. V. D. Perry
Mr. J. B. Knaebel

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cc Mr. V. D. Perry
Mr. J. B. Knaebel

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Old Dick Mine Area
COUNTY: Pima STATE: Ariz.
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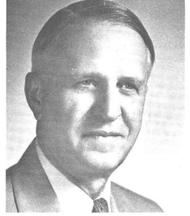
Date of Recommendation October 3, 1963
Date Started
Date Finished
Results:

Recommended by J. A. Barber
Approved by Roland B. Mackay

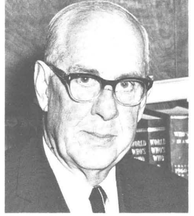
cc Mr. V. D. Perry
Mr. J. B. Knaebel

"... Discovering New Resources for America's Industry"

BANNER MINING COMPANY/ANNUAL REPORT 1966


LEE L. TRAVIS

ALLAN B. BOWMAN


JOHN M. WALLACE

JAMES E. HOGLE

SHERMAN B. HINCKLEY

HAROLD E. RADDATZ

DAVID C. BINTLIFF

ROY M. JACOBS

STEWART W. MARK

JACK G. TAYLOR

BANNER MINING COMPANY

General Officers

L. L. TRAVIS ..... *President*
A. B. BOWMAN ..... *Vice President and General Manager*
JOHN M. WALLACE ..... *Vice President*
JAMES E. HOGLE ..... *Secretary-Treasurer*

Executive Committee

HAROLD E. RADDATZ ..... *La Jolla, California*
LEE L. TRAVIS ..... *Dallas, Texas*
SHERMAN B. HINCKLEY ..... *Salt Lake City, Utah*
ALLAN B. BOWMAN ..... *Tucson, Arizona*
JOHN M. WALLACE ..... *Salt Lake City, Utah*

Board of Directors

DAVID C. BINTLIFF ..... *Houston, Texas*
ALLAN B. BOWMAN ..... *Tucson, Arizona*
SHERMAN B. HINCKLEY ..... *Salt Lake City, Utah*
JAMES E. HOGLE ..... *Salt Lake City, Utah*
ROY M. JACOBS ..... *Milwaukee, Wisconsin*
STEWART W. MARK ..... *Oklahoma City, Oklahoma*
HAROLD E. RADDATZ ..... *La Jolla, California*
JACK G. TAYLOR ..... *Houston, Texas*
LEE L. TRAVIS ..... *Dallas, Texas*
JOHN M. WALLACE ..... *Salt Lake City, Utah*

Operating Mines

BONNEY MINE ..... *Lordsburg, New Mexico*
MISERS CHEST ..... *Lordsburg, New Mexico*
DAISY ..... *Tucson, Arizona*
GENERAL OFFICES ..... *P.O. Box 5605, Tucson, Arizona*

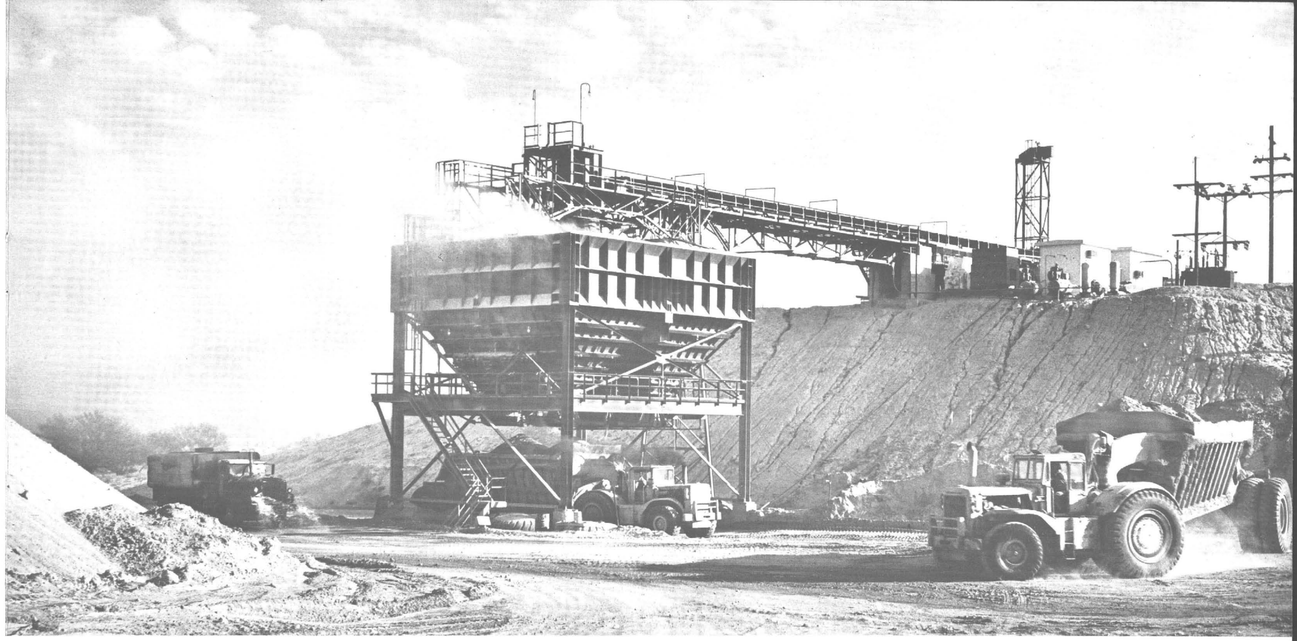
Transfer Agent

ROBERT W. BENGTZEN ..... *132 S. Main St., Salt Lake City, Utah*

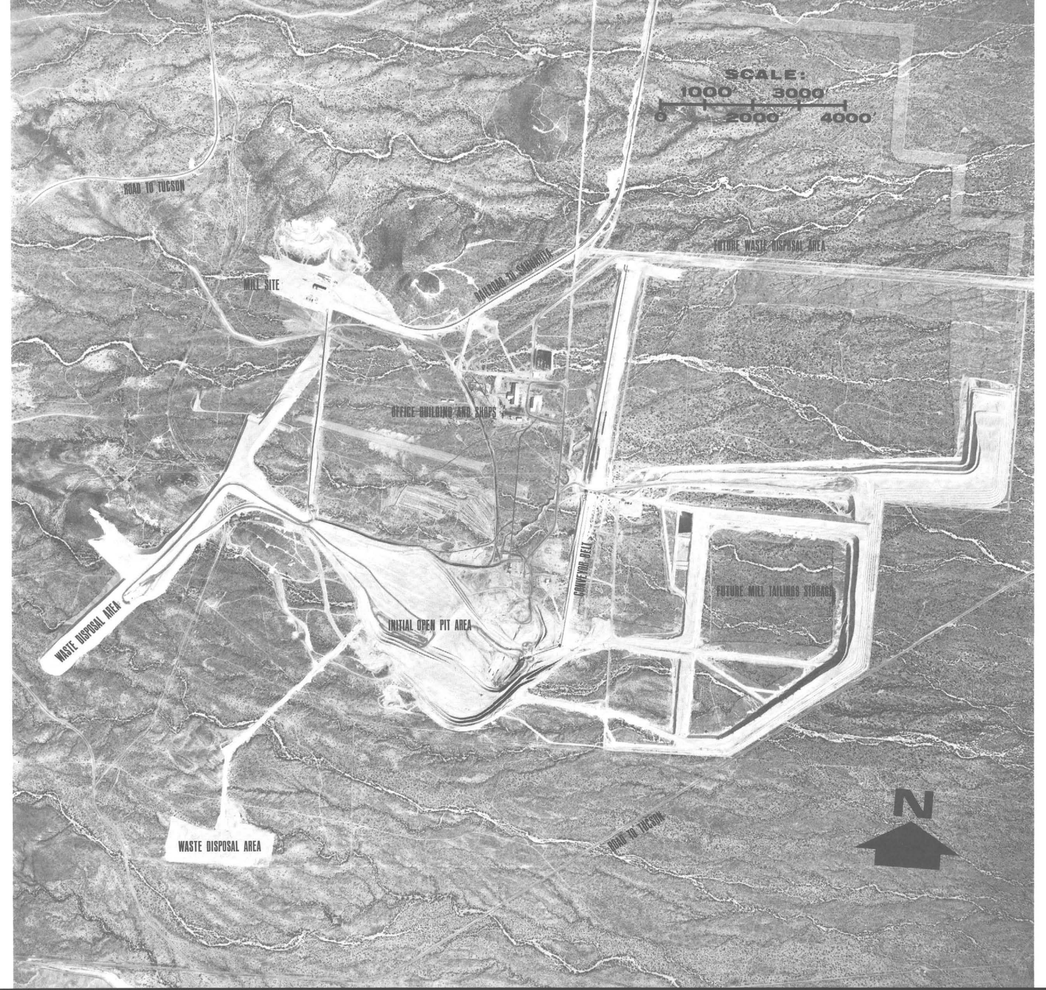
Registrar

WALKER BANK & TRUST CO. ..... *Salt Lake City, Utah*

WALKER LITHOCRAFT - TUCSON



BANNER MINING COMPANY
ANNUAL REPORT 1966



Aerial Photo of Twin Buttes Area

NOTE F — CONTINGENCIES

The Company has certain mining claims and leases under option-to-purchase agreements providing for the payment of $6,967,875 over various periods through 1986 in the form of royalties or minimum rentals. These agreements may be terminated without penalty to the Company. All payments made through December 31, 1966, in accordance with the terms of these agreements have been capitalized and are included in mining claims, leases, and properties. Minimum payments of $352,419 will be due in the year ending December 31, 1967, of which $311,169 will be reimbursed by The Anaconda Company.

NOTE G — TAXES ON INCOME

The Company used net operating loss carryover credits available in the determination of the provision for federal and state income taxes for the year ended December 31, 1965. The Company's taxable income for 1965 was greater than the credits available resulting in a provision of $266,011 for income taxes. No net operating loss carryover credits were available for the year ended December 31, 1966.

NOTE H — SUBSEQUENT EVENT

In February, 1967, the Company granted an option to the Federal Resources Corporation for the sale of the Company's properties at Lordsburg, New Mexico. Upon exercise of the option by the purchaser, the Company will sell its inventories, buildings, machinery, equipment, and mining claims for $700,000. Federal Resources Corporation retains a right thereafter to terminate this transaction upon due notice.

OPINION OF INDEPENDENT ACCOUNTANTS

ERNST & ERNST
Tucson Federal Tower

Board of Directors
Banner Mining Company
Tucson, Arizona

We have examined the balance sheet of Banner Mining Company as of December 31, 1966, and the related statement of income and retained earnings for the year then ended. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances. We previously made a similar examination of the financial statements for the year ended December 31, 1965.

In our opinion, the accompanying balance sheet and statement of income and retained earnings present fairly the financial position of Banner Mining Company at December 31, 1966, and the results of its operations for the year then ended, in conformity with generally accepted accounting principles applied on a basis consistent with that of the preceding year.

Tucson, Arizona
March 10, 1967

ERNST & ERNST

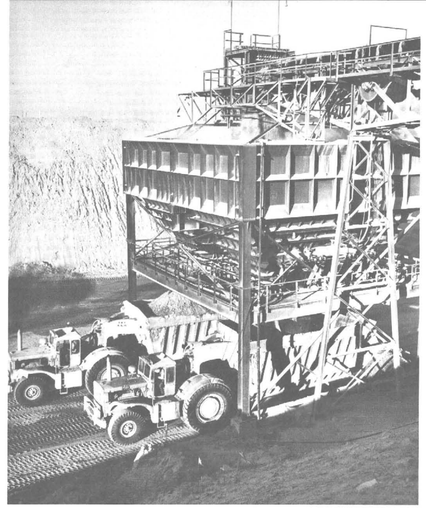
PRODUCTION DATA

Mine	*Location*	*Type of Ore*	*1966 Tonnage*	*1965 Tonnage*
Daisy*	Tucson, Arizona	Sulphide	256,670*	256,670*
Bonney-Misers Chest	Lordsburg, New Mexico	Sulphide	74,702	66,201
			331,372	322,871

Metal content of all concentrates is tabulated for our two areas of production: namely, Tucson, Arizona and Lordsburg, New Mexico.

	1966 Metal Content					**1965 Metal Content**			
	Tons	*Oz. Gold*	*Oz. Silver*	*Lbs. Copper*		*Tons*	*Oz. Gold*	*Oz. Silver*	*Lbs. Copper*
Arizona	14,183	none	50,326*	7,552,924*	Arizona	14,449	none	53,554*	7,552,924*
New Mexico	6,248	1,385	28,911	2,607,380	New Mexico	4,906	2,253.3	35,010	2,212,966
Totals	20,431	1,385	79,237	10,160,304	Totals	19,355	2,253.3	88,564	9,765,890

**Production Note:*
Under our custom mining and milling agreement with Pima Mining Company, Pima is required to mine and mill an average of 256,670 tons annually from our Daisy Mine and to pay Banner for the recovered silver and 7,336,193 pounds of copper after milling, smelting and refining charges and losses. Banner as an alternate may take delivery of this copper and sell it for its own account. This procedure was followed during the last half of the year.



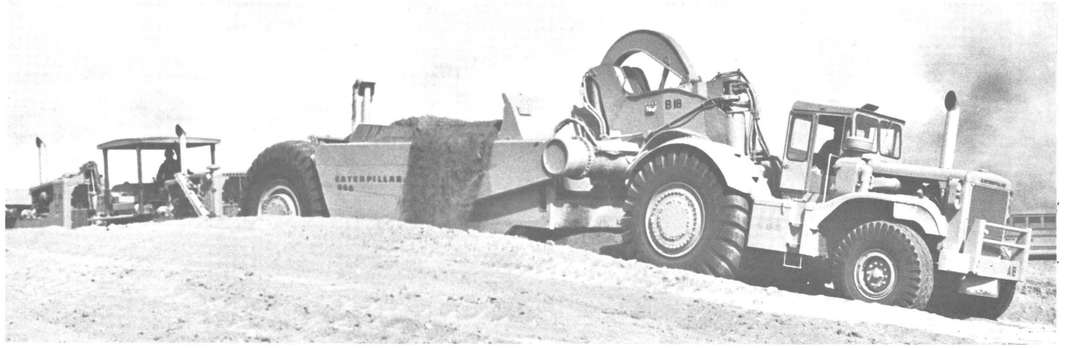
NOTE E — LONG-TERM DEBT AND OTHER LIABILITIES

The details of long-term debt and other liabilities are summarized as follows:

	December 31, 1966		December 31, 1965	
	Current Maturities	Long-term	Current Maturities	Long-term
The Anaconda Company:				
4¾% notes payable		$2,480,308	$42,500	$2,480,308
6¼% note payable		100,000		
Accrued interest		308,396	1,553	189,544
Non-interest bearing advances		300,000		300,000
Contracts for purchase of royalty interest, payable to stockholder — $25,376 annually	$25,376	188,754	25,376	214,130
Contracts for purchase of mining properties, payable to others — $25,600 annually	25,600	78,050	25,000	98,500
Other liabilities			1,976	11,932
	$50,976	$3,455,508	$96,405	$3,294,414

The notes payable to The Anaconda Company are payable out of future production.

The non-interest bearing advances are unsecured and are payable $225,000 in 1968 and $75,000 in 1969.



MAY 19 1967 10 AM

TO THE SHAREHOLDERS OF BANNER MINING COMPANY

The year 1966 was a good year for your company. Our net earnings amounted to $1,353,852.00. State and Federal income taxes paid during the year were greater because of no offsetting carry-forward losses. (See Note G to Financial Statements.) Also affecting the net income was the sale of 4th quarter copper resulting from our agreement with Pima Mining Company. This copper will be delivered by Banner March 15, 1967, under a firm contract of sale. The profit from this sale amounting to about $540,000.00 will be recorded as 1967 business. (See Note B to Financial Statements.)

A dividend of $1.00 per share on the common stock of the company totaling $1,160,060.00 was paid to shareholders on February 5, 1966. A dividend of $1.00 per share was also declared in November, 1966 for payment on February 7, 1967.

The stripping operations to uncover the Twin Buttes ore body by The Anaconda Company under its profit-sharing lease from Banner proceeded at a stepped-up pace during most of 1966 and the overburden is now being removed at the amazing rate of over 300,000 tons per day.

As of April 1, 1967 a total of 82,000,000 tons of alluvium had been taken from the pit. Of this total 49,538,000 tons were removed in 1966. This leaves a balance of 138,000,000 tons to be stripped before production of ore begins. An aerial photograph of the Twin Buttes pit area on the facing page will give you an idea of the immense size of the operations there.

A standard guage railroad has been built from the Southern Pacific railroad at Sahuarita, a distance of 7.4 miles to the projected mill site area at Twin Buttes.

Further construction of surface plant facilities at Twin Buttes is under way on a large scale and includes: a warehouse, mill shop, mill assay and research laboratory, foundations for 7 diesel-gas generators for mine and mill plant power, tire shop, gasoline truck repair facilities, diamond drill core storage buildings and excavation for crushing and milling plant machinery and buildings. At this writing a one-mile extension to the large conveyor belt system is nearly completed.

The Company's mining operations at Lordsburg, New Mexico, were closed down on December 31, 1966. The artificially low price for the copper production from these mines would not permit us to make a profit from the operations there under present conditions.

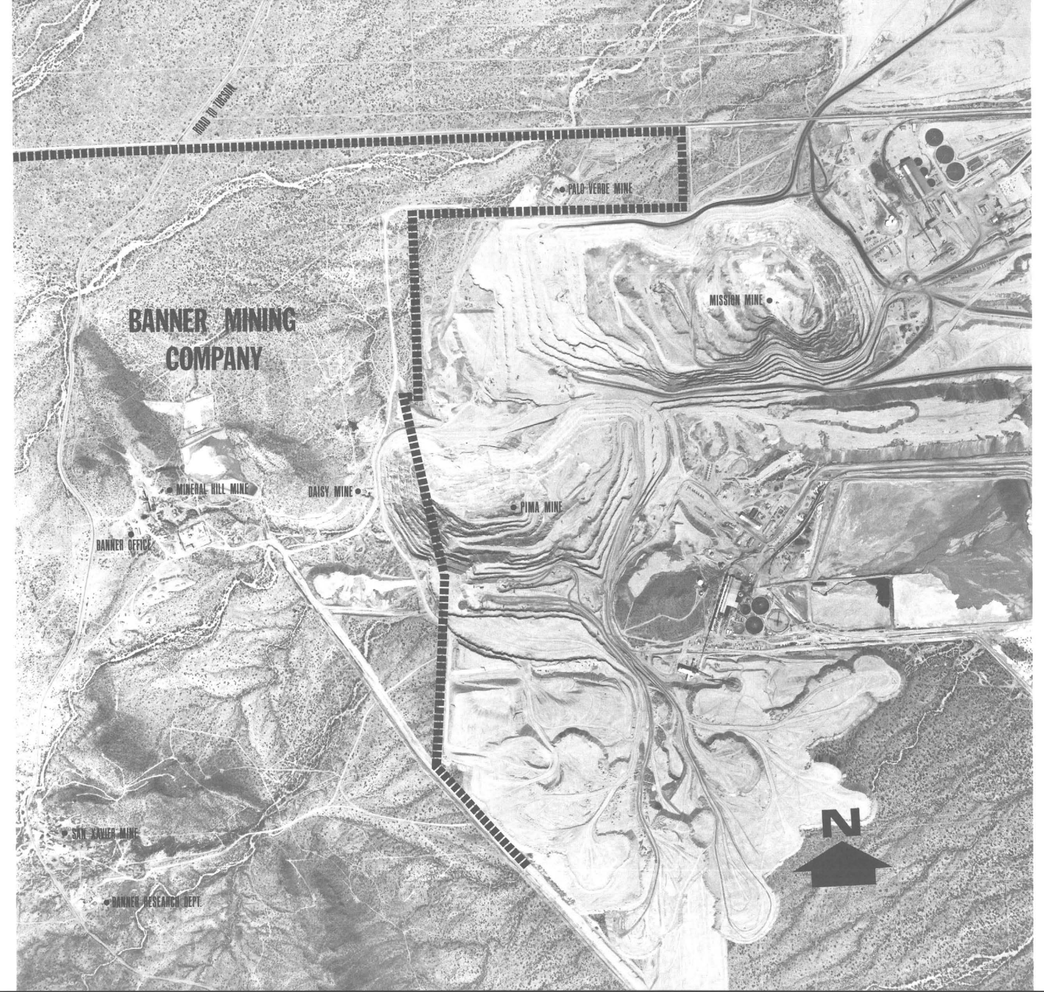
Several other mining firms expressed an interest in our Lordsburg, New Mexico mining properties and related improvements. As a result, an Exploration-Option Agreement was signed effective February 10, 1967, with Federal Resources Corporation of Salt Lake City, Utah, for the exploration and development and purchase of these properties. Under the terms of the agreement, Federal Resources has until June 30, 1967 to decide if they will proceed with development work leading to production from these mines. In the period to June 30, 1967 they plan a program of diamond drilling on possible extensions of the various mineralized zones.

The net proceeds received from Pima Mining Company and the sale of copper returned to Banner by Pima under terms of a custom mining and milling agreement for the first three quarters of 1966 amounted to $1,130,278.39 after deducting costs and payments to Pima. It is expected that the sale of 4th quarter 1966 production in March of 1967 will provide a profit of about $540,000.00 and will be taken into 1967 income.

Our Research Department continued evaluation of our process to recover copper from oxidized ores in a limestone gangue both in the laboratory and in the new 5-ton-per-day pilot plant on which construction was completed during the year. At this date we can report encouraging results in the relatively high percentage recovery of copper from these ores and the economical recovery of our chemical leaching reagent, for re-use, from leaching solutions.

The company continued some core drilling and geological studies in two old former mining districts in Mineral and Elko Counties of Nevada during the year. To date some copper and molybdenum mineralization has been found but not enough ore grade material to warrant any commercial operation. Geophysical and geochemical work is continuing at one of these locations.

This is Banner's newly-completed research facility and pilot plant.



Aerial Photo of Mineral Hill Subdistrict, Pima County, Arizona

NOTES TO FINANCIAL STATEMENTS
December 31, 1966

NOTE A — AGREEMENT WITH THE ANACONDA COMPANY

The Company leases to The Anaconda Company all mining and other real properties of the Company located in Pima County, Arizona, except that part of the Company's property which is part of the Pima Pit, the ores from which are being mined and milled under contract by Pima Mining Company. The Anaconda Company will lease these properties for an initial term of 60 years with option to extend the term of the lease by giving notice for such additional periods as The Anaconda Company may deem necessary to exhaust the mineral deposits in these properties. The Company will receive advanced or minimum royalties and additional royalties based upon future production by The Anaconda Company. Advanced royalties of $1,750,000 were received during 1966. The lease may be terminated by The Anaconda Company by giving the Company not less than 180 days notice.

NOTE B — COPPER INVENTORY IN TRANSIT AND RECORDING OF INCOME FROM OPERATIONS OF PIMA PIT

Under terms of an agreement dated November 23, 1959, Pima Mining Company is mining and milling ores from the Company's property which is part of the Pima Pit. The Company reimburses Pima Mining Company for mining, milling, smelting, and refining costs. The agreement provides for partial settlement quarterly with final settlement for the production of each calendar year to be made by March 15 following the end of the year. For each quarter's production the Company has the option of receiving cash payment or refined copper from Pima Mining Company.

Prior to July 1, 1966, the Company elected to receive cash payments from Pima Mining Company, however, beginning July 1, 1966, the Company elected to receive refined copper rather than cash payments. When the Company elects to receive refined copper, it then contracts to sell the refined copper to be delivered when received from Pima Mining Company.

Production for the third quarter of 1966 was delivered and sold during 1966 and the applicable sale and cost of sale is recorded in the statement of income for the year ended December 31, 1966.

Mining, milling, smelting, and refining costs applicable to fourth quarter production was recorded on the balance sheet at December 31, 1966, as copper inventory in transit. The Company had contracted to sell the copper produced in the fourth quarter of 1966 with delivery to be made March 15, 1967. This sale will be recorded in the year ending December 31, 1967, and will result in a profit of approximately $540,000. Accordingly, the statement of income for 1966 includes only nine months of the results of operations from the Pima Pit, whereas the statement of income for 1965 includes twelve months of the results of operations from the Pima Pit.

NOTE C — LORDSBURG, NEW MEXICO OPERATIONS

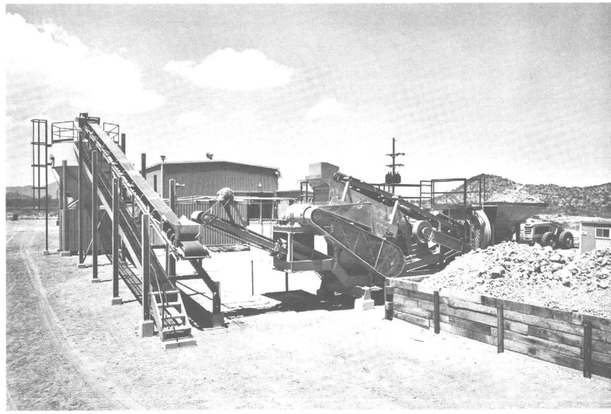
At December 31, 1966, the Company ceased its mining operations at Lordsburg, New Mexico, and terminated substantially all mining employees. The unrecovered Lordsburg mining claims costs of approximately $20,000 and the applicable deferred development costs of approximately $54,000 were written off and charged to depreciation, depletion, and amortization expenses.

Inventories of operating supplies in the Lordsburg warehouse, valued at the lower of cost or market at December 31, 1966, amounted to $85,770. See Note H to the notes to financial statements for details of events subsequent to the balance sheet date concerning these inventories.

NOTE D — DEFERRED DEVELOPMENT COSTS

In accordance with industry practice, it is the Company's policy to defer costs incurred in the development of properties and to amortize the costs on the basis of ore mined at a rate which will spread the costs over the estimated ore reserves of the properties.

No ore has been mined from the Palo Verde mining property since June 1963 and consequently no amortization of related deferred development costs has been recorded since that date. This property is under lease to The Anaconda Company and at December 31, 1966, the unamortized deferred development costs of the Palo Verde Mine was $1,094,100.

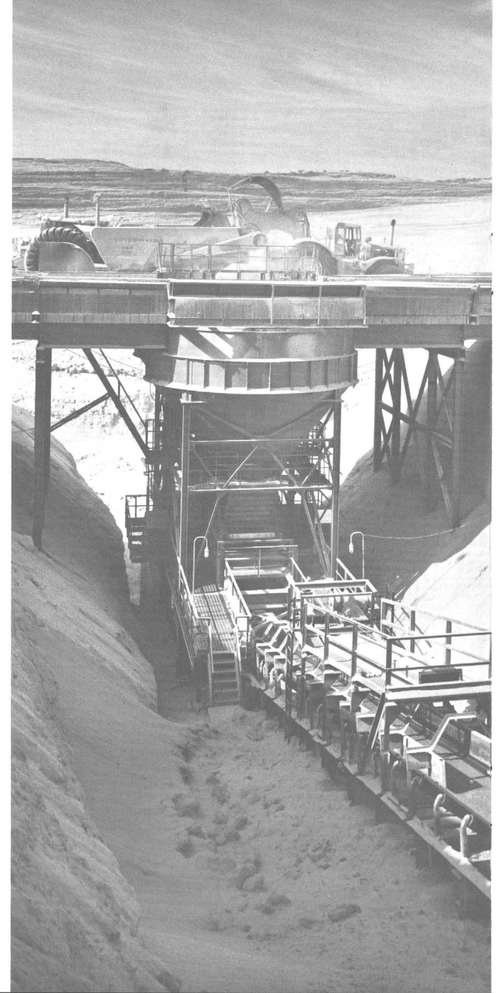


This is Banner's newly-completed research facility and pilot plant.

STATEMENT OF INCOME AND RETAINED EARNINGS

	Year ended December 31	
	1966	1965
Sales — Note B	$3,608,526	$3,978,789
Advanced royalties — Note A	1,750,000	1,750,000
Other income	57,725	35,423
	$5,416,251	$5,764,212
Costs and expenses:		
Mining, milling, smelting, and refining	$2,496,664	$2,828,614
Depreciation, depletion, and amortization — Note C	189,818	94,609
Research and experimental	77,735	19,306
Administrative and general	322,047	312,542
Interest	123,489	123,400
Unrecovered costs of abandoned properties	52,646	——
	$3,262,399	$3,378,471
NET INCOME BEFORE INCOME TAXES	$2,153,852	$2,385,741
Federal and state income taxes — Note G	800,000	266,011
NET INCOME (Per share: 1966 — $1.17; 1965 — $1.83)	$1,353,852	$2,119,730
Retained earnings at beginning of year	1,093,957	134,287
	$2,447,809	$2,254,017
Cash dividends on Common Stock (1966 — $2 per share; 1965 — $1 per share)	2,320,120	1,160,060
RETAINED EARNINGS AT END OF YEAR	$ 127,689	$1,093,957

See notes to financial statements.



An aerial photograph of the Mineral Hill area in Pima County, Arizona, on page 4 shows the location of Banner Mining Company's mineral holdings (now under lease to The Anaconda Company) with respect to open pit operations of Pima Mining Company and the American Smelting & Refining Company. The Palo Verde Mine area shown in the photograph contains a large tonnage of open pit type copper-molybdenum ores. However, production of this ore will probably await completion of the mill at Twin Buttes.

Exploratory drilling continued at Banner's Twin Buttes and Helvetia properties in Pima County, Arizona, throughout the year. Extensive additional ore reserves at Twin Buttes are indicated by this drilling. At Helvetia, the drilling continued to be favorable and is aimed at delineating this copper-molybdenum deposit.

The Balance Sheet of the Company as of December 31, 1966, Statement of Income and Retained Earnings for the Year 1966, and Notes to Financial Statements as audited by Ernst & Ernst, Certified Public Accountants, appear on the following pages.

We thank all of our stockholders for their continued interest and our directors for their advice and support and our operating staff and employees for their loyal and capable work throughout the year.

L. L. TRAVIS *President*

A. B. BOWMAN *Vice President*

BONNEY-MISERS CHEST MINES

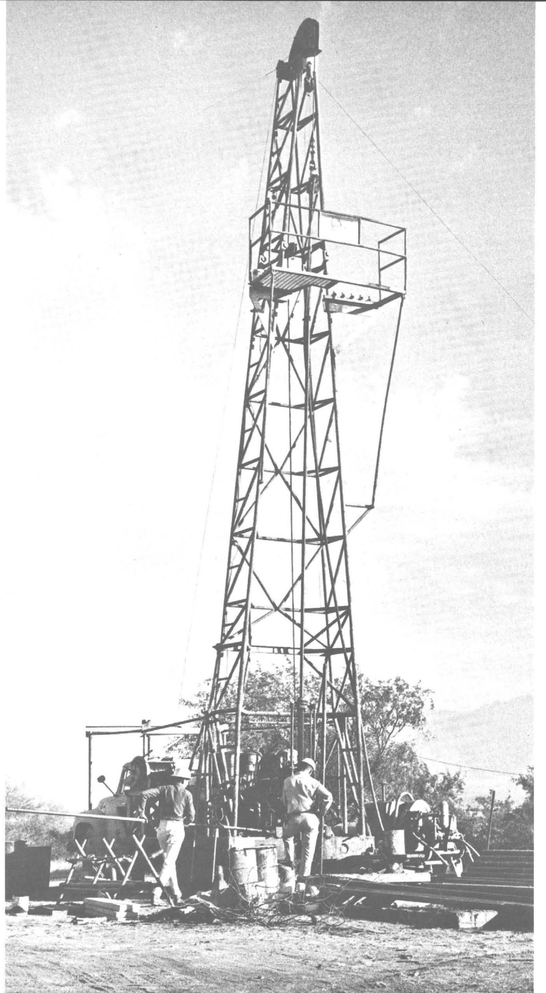
Production from these mines at Lordsburg, New Mexico, totaled 74,702 tons which compares with 66,201 tons in 1965. From these ores 6,247.98 tons of concentrates were produced which contained 2,607,380 pounds of copper, 1,384.50 ounces of gold and 28,911 ounces of silver.

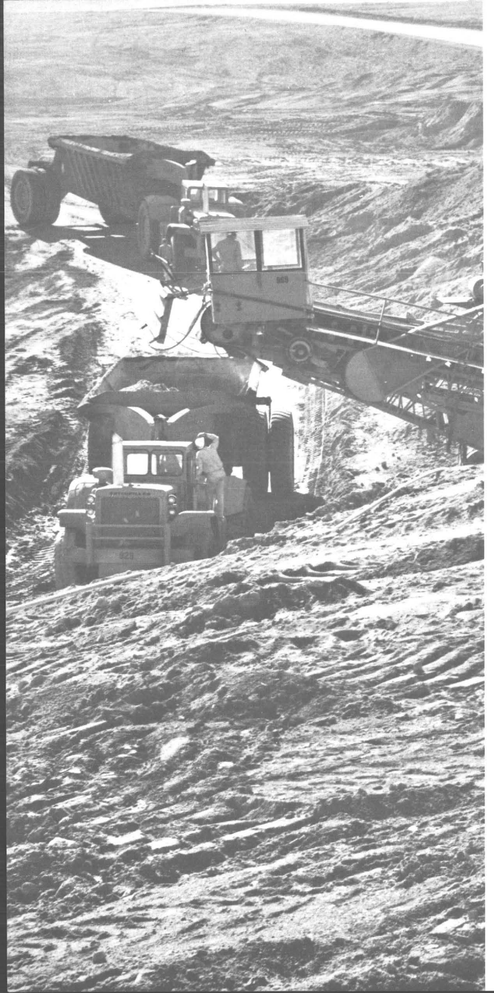
Exploration and development work continued at about the same pace as in 1965 and the amounts thereof are contained in the following tabulation:

Raising	105.0	feet
Drifting and Crosscutting	4,031.2	feet
Diamond drilling	4,260.0	feet
6" Down the Hole drilling	1,876.0	feet
Longhole drilling	21.0	feet

The controlled price we received for our copper was not adequate to maintain profitable operations at these mines. For this reason, it was decided to close them down on December 31, 1966.

An Exploration-Option Agreement was signed effective February 10, 1967 with Federal Resources Corporation of Salt Lake City, Utah for the further exploration of these properties with an option to later develop and purchase all of our claims, machinery and other improvements at this location.





BALANCE SHEET/BANNER MINING COMPANY

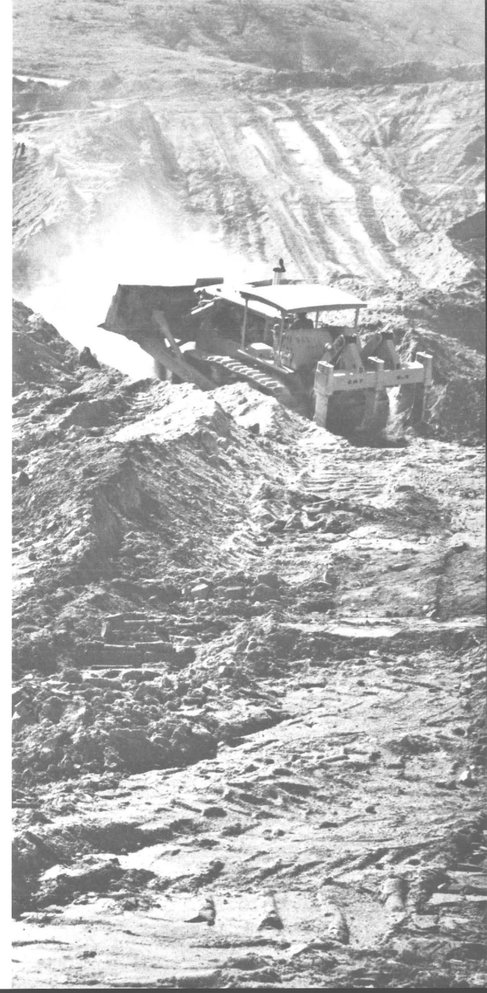
ASSETS

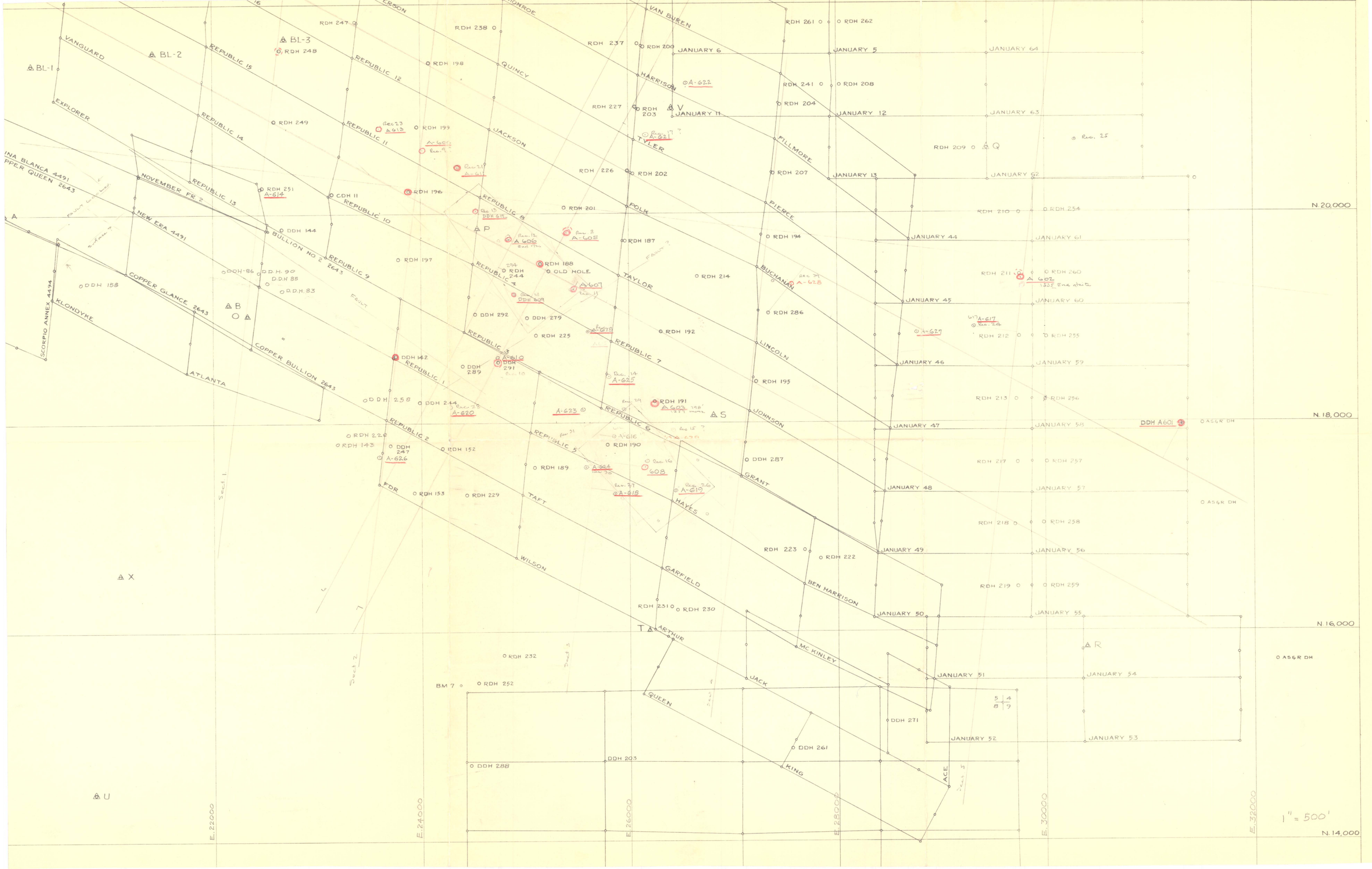
	December 31 1966	December 31 1965
CURRENT ASSETS		
Cash and certificates of deposit:		
Demand deposits	$ 534,133	$ 228,825
Savings deposits	20,000	20,000
Certificates of deposit	900,000	750,000
	$1,454,133	$ 998,825
United States Treasury bills — at cost	344,143	——
Accounts receivable and accrued interest — Note B	39,358	478,513
Copper inventory in transit — Note B	465,222	——
Operating supplies — at lower of cost (first-in, first-out method) or market — Note C	85,770	94,061
Prepaid expenses	5,521	7,742
TOTAL CURRENT ASSETS	$2,394,147	$1,579,141
PROPERTY, PLANT, AND EQUIPMENT — on the basis of cost		
Mining claims, leases, and properties (including exploration costs)	$4,297,097	$4,054,270
Oil properties	56,210	56,210
Buildings and equipment	1,278,657	833,030
	$5,631,964	$4,943,510
Less allowances for depletion and depreciation	1,391,948	1,346,708
	$4,240,016	$3,596,802
DEFERRED CHARGES AND OTHER ASSETS		
Development costs less allowances for amortization (1966 — $389,026; 1965 — $467,697) — Notes C and D	$1,094,100	$1,185,739
Deposits and sundry deferred charges	12,881	36,322
	$1,106,981	$1,222,061
	$7,741,144	$6,398,004

See notes to financial statements.

LIABILITIES AND STOCKHOLDERS' EQUITY

	December 31 1966	December 31 1965
CURRENT LIABILITIES		
Short-term notes payable to bank	$ 100,000	$ ——
Trade and other payables	34,623	56,029
Due for mining, milling, smelting, and refining costs — Note B	517,279	——
Salaries, wages, and payroll taxes	30,772	34,509
Taxes, other than income taxes	21,962	32,875
Dividend payable	1,160,060	——
Federal and state income taxes	642,148	189,688
Current maturities of long-term debt	50,976	96,405
TOTAL CURRENT LIABILITIES	$2,557,820	$ 409,506
LONG-TERM DEBT AND OTHER LIABILITIES, less current maturities — Note E	3,455,508	3,294,414
STOCKHOLDERS' EQUITY		
Common Stock — par value $.50 a share:		
Authorized — 2,000,000 shares		
Issued and outstanding — 1,160,060 shares	$ 580,030	$ 580,030
Additional paid-in capital	1,020,097	1,020,097
Retained earnings	127,689	1,093,957
	$1,727,816	$2,694,084
CONTINGENCIES — Note F		
	$7,741,144	$6,398,004

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GRANT
HAYES
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McKINLEY
JACK
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COPPER GLANCE 2643
COPPER BULLION 2643
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608
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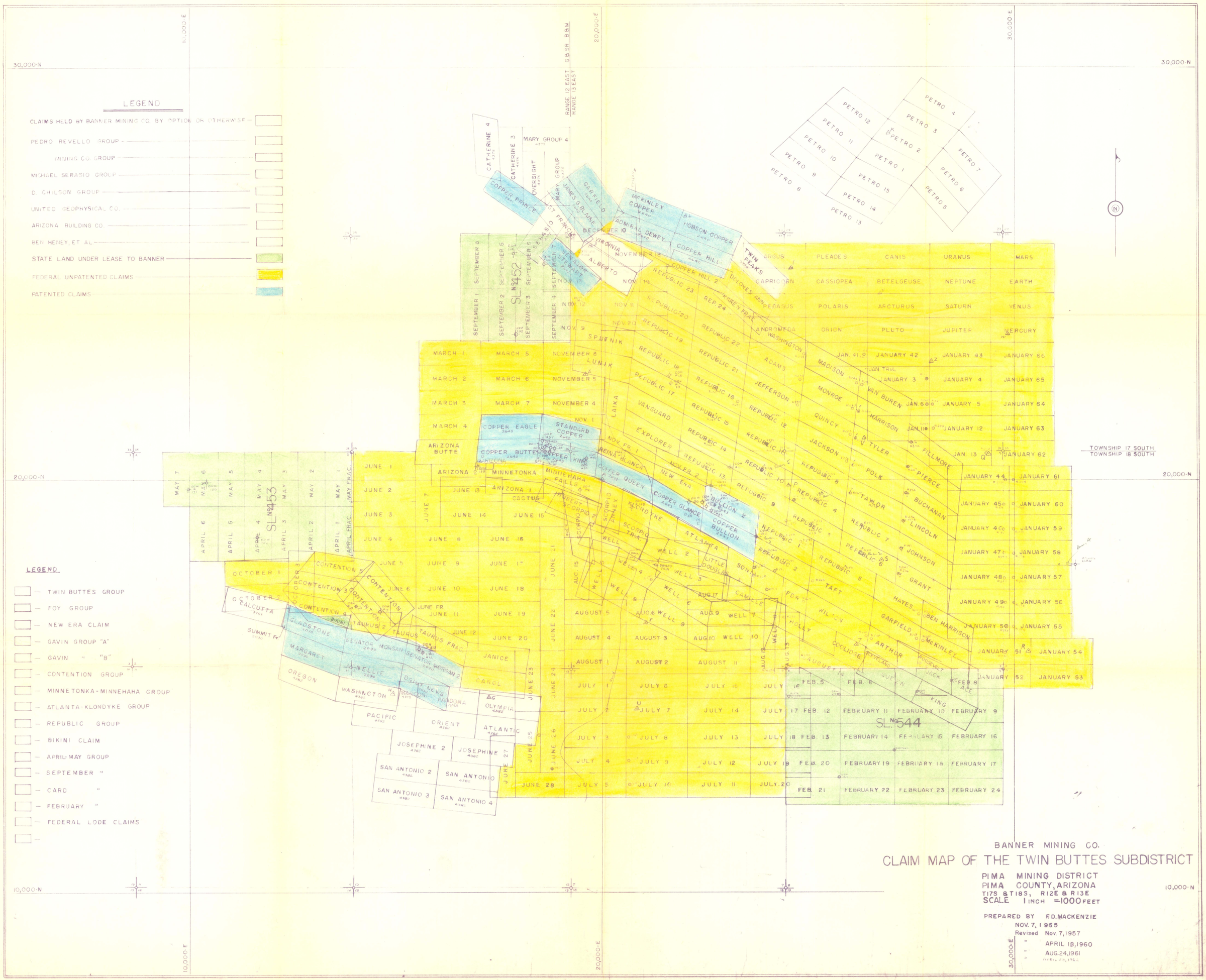
LEGEND
CLAIMS HELD BY BANNER MINING CO. BY OPTION OR OTHERWISE
PEDRO REVELLO GROUP
MINING CO. GROUP
MICHAEL SERASIO GROUP
D. CHILSON GROUP
UNITED GEOPHYSICAL CO.
ARIZONA BUILDING CO.
BEN HENEY, ET. AL.
STATE LAND UNDER LEASE TO BANNER
FEDERAL UNPATENTED CLAIMS
PATENTED CLAIMS
LEGEND
TWIN BUTTES GROUP
FOY GROUP
NEW ERA CLAIM
GAVIN GROUP "A"
GAVIN " "B"
CONTENTION GROUP
MINNETONKA-MINNEHAHA GROUP
ATLANTA-KLONDYKE GROUP
REPUBLIC GROUP
BIKINI CLAIM
APRIL-MAY GROUP
SEPTEMBER "
CARD "
FEBRUARY "
FEDERAL LODE CLAIMS
30,000-N
20,000-N
10,000-N
10,000-E
20,000-E
30,000-E
RANGE 12 EAST G&SR B&M
RANGE 13 EAST
TOWNSHIP 17 SOUTH
TOWNSHIP 18 SOUTH
PETRO 1
PETRO 2
PETRO 3
PETRO 4
PETRO 5
PETRO 6
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PETRO 8
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PETRO 11
PETRO 12
PETRO 13
PETRO 14
PETRO 15
SL. No 452
SL. No 453
SL. No 544
COPPER PRINCE
CATHERINE 4
CATHERINE 3
OVERSIGHT
MARY GROUP 4
MARY GROUP
JAMES G. BLAINE
GARFIELD
MCKINLEY COPPER
ADMIRAL DEWEY
HOBSON COPPER
COPPER HILL
TWIN PEAKS
ALBERTO
SENATOR STEWART
COPPER EAGLE
STANDARD COPPER
COPPER BUTTE
COPPER KING
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MINNEHAHA FALLS
ARIZONA 1
CACTUS
COPPER GLANCE
COPPER BULLION
BULLION 2
KLONDYKE
ATLANTA
LITTLE DOUGLAS
CALCUTTA
SUMMIT
GLADSTONE
SENATOR MORGAN
MARGARET
NELLIE
OREGON
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PLEADES
CANIS
URANUS
MARS
CAPRICORN
CASSIOPEA
BETELGEUSE
NEPTUNE
EARTH
POLARIS
ARCTURUS
SATURN
VENUS
ORION
PLUTO
JUPITER
MERCURY
ANDROMEDA
WASHINGTON
ADAMS
JEFFERSON
MADISON
MONROE
QUINCY
JACKSON
VAN BUREN
HARRISON
TYLER
POLK
TAYLOR
FILLMORE
PIERCE
BUCHANAN
LINCOLN
JOHNSON
GRANT
HAYES
GARFIELD
ARTHUR
CLEVELAND
BEN HARRISON
McKINLEY
ROOSEVELT
TAFT
WILSON
HARDING
COOLIDGE
HOOVER
FDR
TRUMAN
EISENHOWER
KENNEDY
JOHNSON
NIXON
FORD
CARTER
REAGAN
BUSH
CLINTON
SPUTNIK
LUNIK
LAIKA
VANGUARD
EXPLORER
REPUBLIC
REINA BLANCA
NEW ERA
SCORPIO
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CONTENTION
TAURUS
BIKINI
DALLY NEWS
MARCONI
PANDORA
JANICE
CAROL
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MARCH 3
MARCH 4
MARCH 5
MARCH 6
MARCH 7
NOVEMBER 8
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NOVEMBER 4
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AUGUST 1
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JAN. TRIAL
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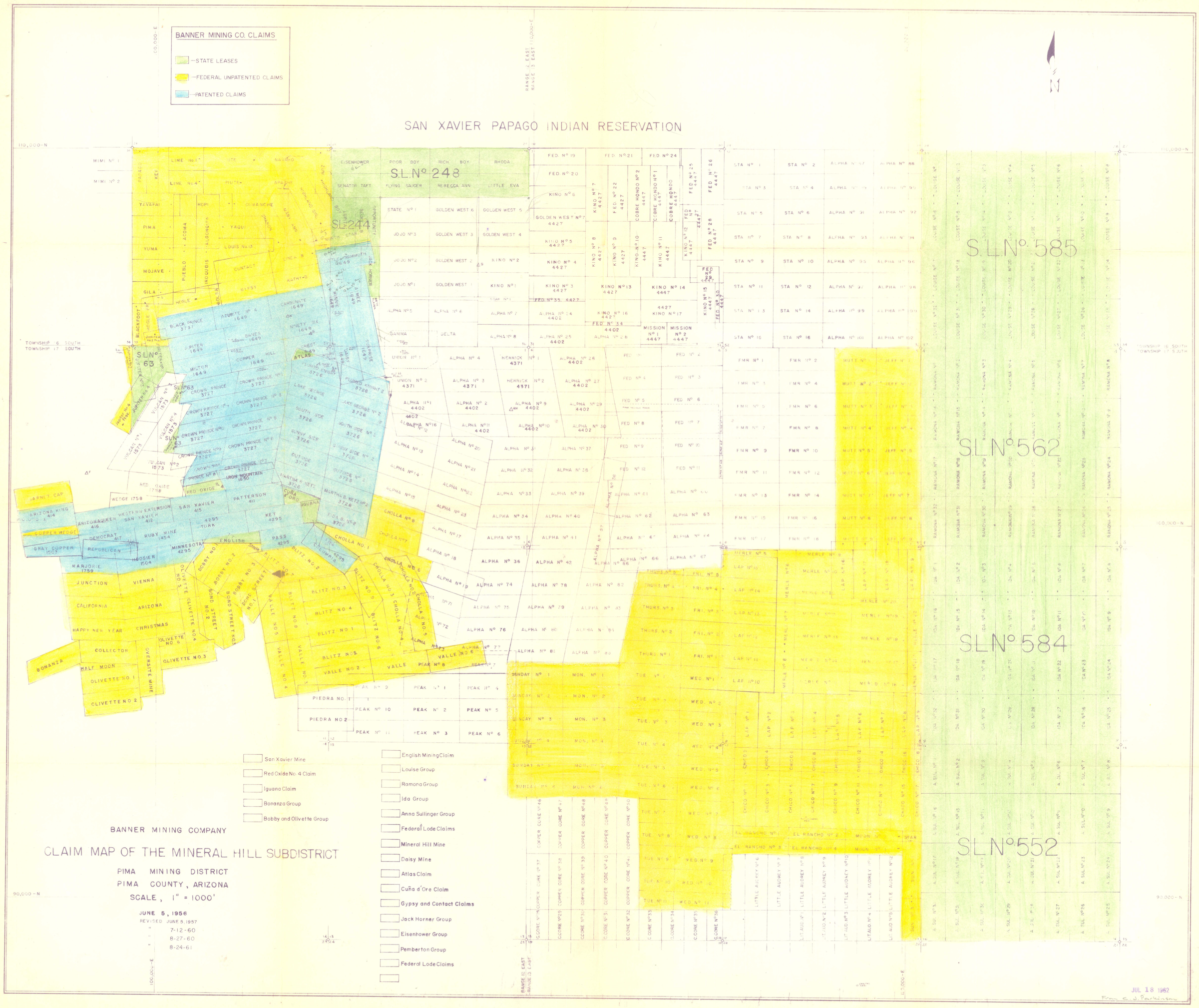
JANUARY 53
BANNER MINING CO.
CLAIM MAP OF THE TWIN BUTTES SUBDISTRICT
PIMA MINING DISTRICT
PIMA COUNTY, ARIZONA
T17S & T18S, R12E & R13E
SCALE 1 INCH = 1000 FEET
PREPARED BY F.D. MACKENZIE
NOV. 7, 1955
Revised Nov. 7, 1957
" APRIL 18, 1960
" AUG. 24, 1961
JUL 18 1962
From C. J. Pearkinson


BANNER MINING CO. CLAIMS
—STATE LEASES
—FEDERAL UNPATENTED CLAIMS
—PATENTED CLAIMS
SAN XAVIER PAPAGO INDIAN RESERVATION
S.L.Nº 248
SL 244
SL Nº 63
S.L.Nº 585
S.L.Nº 562
SLNº 584
SLNº 552
TOWNSHIP 16 SOUTH
TOWNSHIP 17 SOUTH
RANGE 12 EAST
RANGE 13 EAST
110,000-N
100,000-N
90,000-N
100,000-E
110,000-E
San Xavier Mine
Red Oxide No. 4 Claim
Iguana Claim
Bonanza Group
Bobby and Olivette Group
English Mining Claim
Louise Group
Ramona Group
Ida Group
Anna Sullinger Group
Federal Lode Claims
Mineral Hill Mine
Daisy Mine
Atlas Claim
Cuña d'Ore Claim
Gypsy and Contact Claims
Jack Horner Group
Eisenhower Group
Pemberton Group
Federal Lode Claims
BANNER MINING COMPANY
CLAIM MAP OF THE MINERAL HILL SUBDISTRICT
PIMA MINING DISTRICT
PIMA COUNTY, ARIZONA
SCALE, 1" = 1000'
JUNE 5, 1956
REVISED JUNE 5, 1957
" 7-12-60
" 8-27-60
" 8-24-61
JUL 18 1962
From C. J. Parkinson