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PRINTED: 08/02/2001

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES AZMILS DATA

PRIMARY NAME: GOULD MINE

ALTERNATE NAMES:

COLUMBIA MINE

COPPER BELL MINE

PIMA COUNTY MILS NUMBER: 16

LOCATION: TOWNSHIP 13 S RANGE 12 E SECTION 31 QUARTER SW
LATITUDE: N 32DEG 15MIN 32SEC LONGITUDE: W 111DEG 08MIN 33SEC
TOPO MAP NAME: AVRA - 7.5 MIN

CURRENT STATUS: PAST PRODUCER

COMMODITY:

COPPER SULFIDE

SILVER

BIBLIOGRAPHY:

AZBM BULL. 189, P. 84, 1974

ADM MR GOULD MINE FILE

AZBM BULL. 106, P. 18

ADM MR "U" FILE CU 76

PRINTED: 04-09-2009

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES AZMILS DATA

PRIMARY NAME: COLUMBIA MINE

ALTERNATE NAMES:

COPPER BELL MINE
GOULD MINE

PIMA COUNTY MILS NUMBER: 13

LOCATION: TOWNSHIP 13 S RANGE 12 E SECTION 30 QUARTER SW
LATITUDE: N 32DEG 16MIN 09SEC LONGITUDE: W 111DEG 08MIN 51SEC
TOPO MAP NAME: AVRA - 7.5 MIN

CURRENT STATUS: PAST PRODUCER

COMMODITY:

COPPER OXIDE
COPPER SULFIDE
SILVER

BIBLIOGRAPHY:

AZBM BULL. 189, P. 84, 1974
ADMMR GOULD MINE FILE

PRINTED: 01-13-2010

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES AZMILS DATA

PRIMARY NAME: COPPER BELL MINE

ALTERNATE NAMES:
GOULD MINE
COLUMBIA

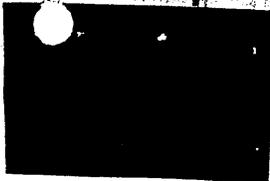
PIMA COUNTY MILS NUMBER: 14

LOCATION: TOWNSHIP 13 S RANGE 12 E SECTION 30 QUARTER SW
LATITUDE: N 32DEG 16MIN 09SEC LONGITUDE: W 111DEG 08MIN 51SEC
TOPO MAP NAME: AVRA - 7.5 MIN

CURRENT STATUS: PAST PRODUCER

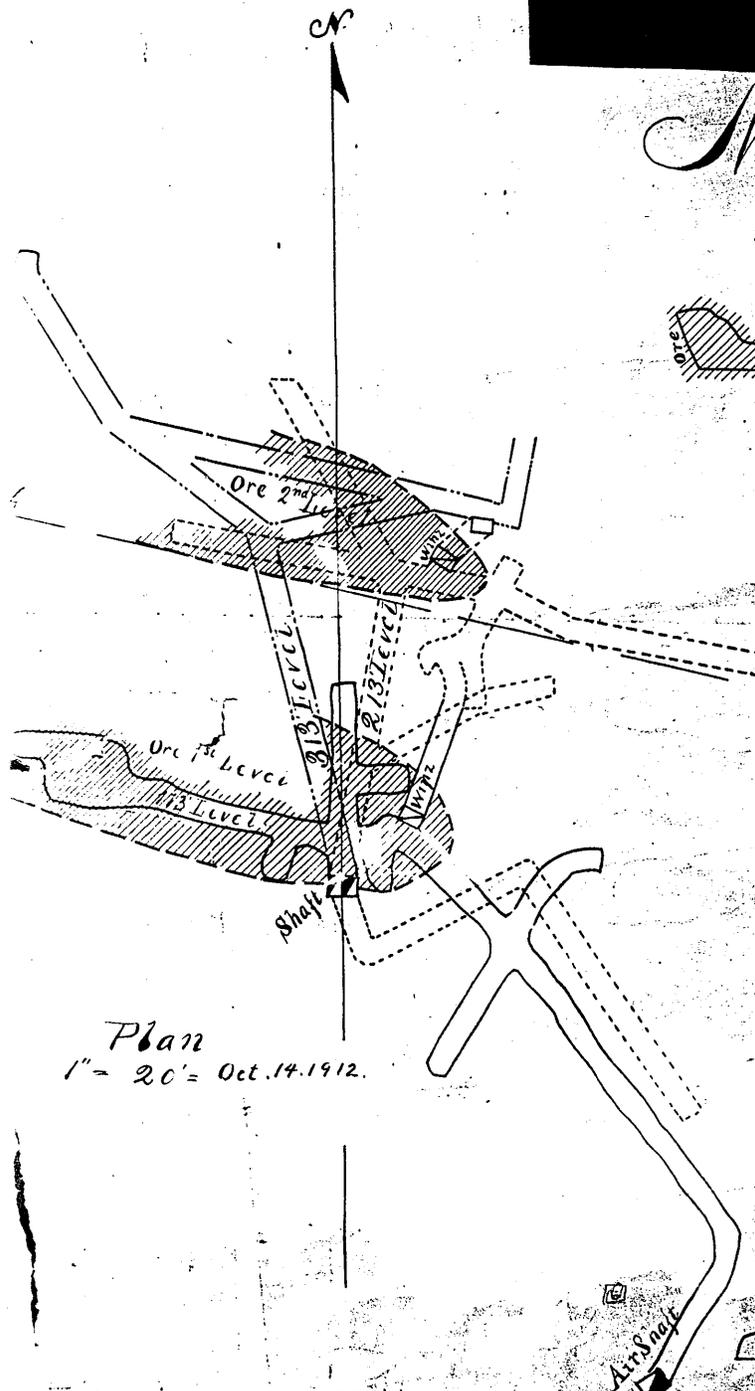
COMMODITY:
COPPER OXIDE
COPPER SULFIDE
SILVER
GOLD LODE

BIBLIOGRAPHY:
AZBM BULL. 189, P. 84, 1974
ADM MR GOULD MINE FILE
AZBM BULL. 106, P. 18
BLM MINING DISTRICT SHEET 619

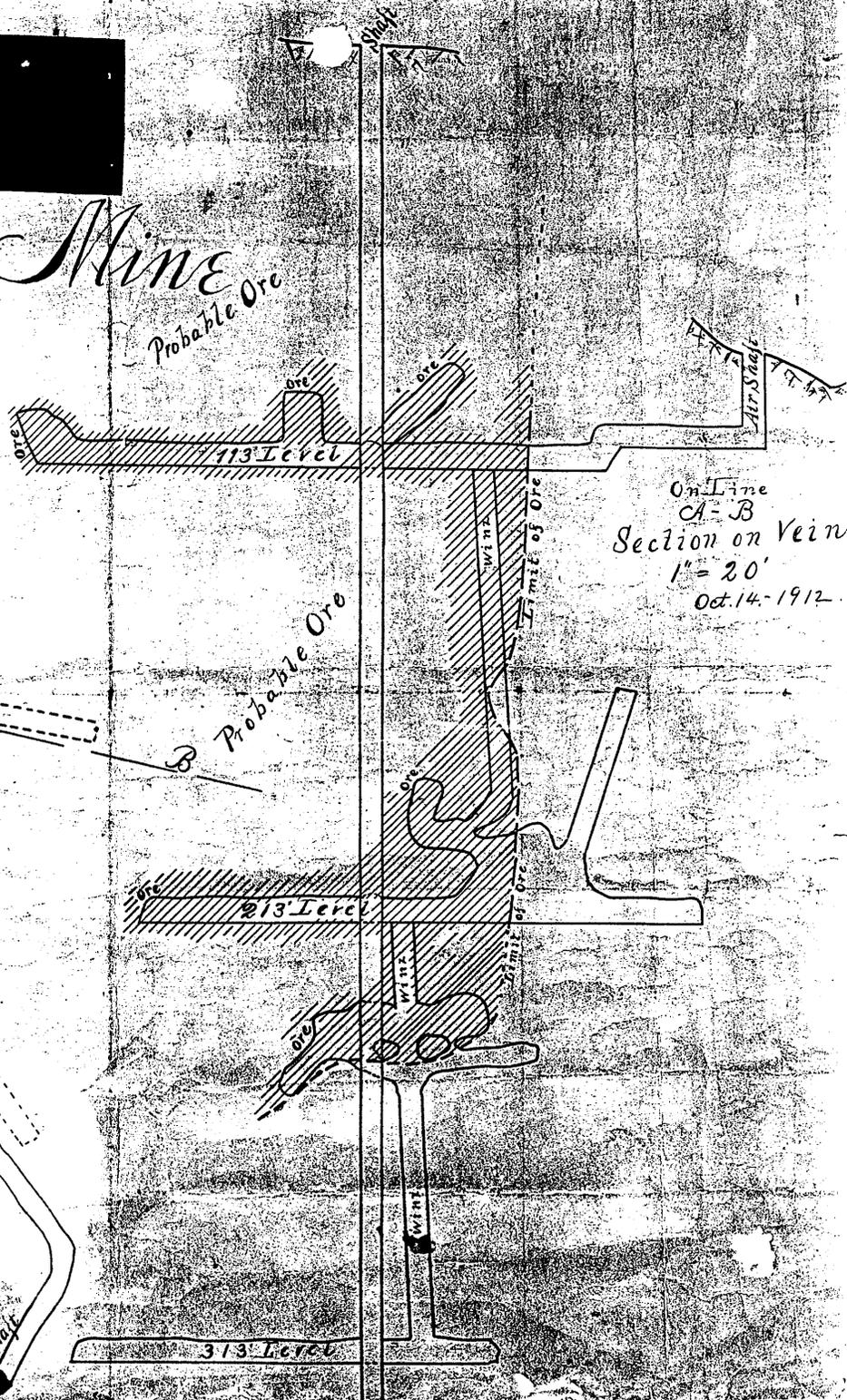


Mine

Probable Ore



Plan
1" = 20' = Oct. 14. 1912.



On Line
A-B
Section on Vein
1" = 20'
Oct. 14. 1912.

GOULD MINE
COLUMBIA MINE
COPPER BELL
aka COPPER MINE NO. 1 & 5 CLAIMS, INVINCIBLE CLAIM,
ABM Bull. 106 p. 6, 18 SIERRA ARRIBA CLAIM
ABM Bull. 140 p. 98

PIMA COUNTY
AMOLE DIST.
T13S, R12E, sec31
T13S, R11E, sec 36

Production Possibilities of the Marginal
Copper Mines in Arizona, 1941 p. 65

Arizona Mining Journal, June 1918, p. 38

MAPS - Upstairs in the ABM rolled file boxes - 1 claim map and 1 underground map

NAME OF MINE: GOULD
OWNER: John Greenwood, 40 E.14th St.,
Tucson

COUNTY: Pima
DISTRICT:
METALS: Cu

OPERATOR AND ADDRESS		MINE STATUS	
Date: 4/45	H.C. Ertel, Rt.1, Box 980, Tucson	Date: 4/45 1/46	RFC loan \$5000 Milling Idle

MEMORANDUM

6-15-42

DEPT. MINERAL RESOURCES DIVISION

RECEIVED

JUN 17 1942

PHOENIX, ARIZONA

90

To: Director, Dept. Mineral Resources
From: George A. Ballam

This property is held by John Greenwood, 40 E. 14th, Tucson. It is located in the Tucson district, about 11 miles northwest of the city.

Several cars of ore have been shipped to International which ran from 3½% to 5% copper. There is no activity at present, but Greenwood is considering application for accessibility loan as soon as the new plan is worked out. He intends to go to Phoenix shortly and will call at the office.

There are two shafts on the property about 300' deep with some stoping. Water stands at 150'.

George A. Ballam

WAER, MARTIN & GILBERT ET AL, (OWNERS)
Tucson, Ariz.

6-17-54

MINE : Columbia Mine (formerly called Gould Mine) Amole Dist. Pima Co
Sec.31 -- T 13 S --R 12 E and
Sec.36 --T 13 S -- R 11 E.

CARRASCO, LOUIS (OWNERS)
Martin & Gilbert Waer,
Elmer Dow, &
Ed Brady,
Tucson, Arizona

6-17-54

MINE: COLUMBIA MINE (formerly Gould Mine) Amole Dist. Pima County.
Sec. 31 -- T 13 S -- R 12 E and
Sec. 36 -- T 13 S -- R 11 E.

PRINTED: 01-14-2010

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES AZMILS DATA

PRIMARY NAME: COPPER KING

ALTERNATE NAMES:
MILE WIDE MINE

PIMA COUNTY MILS NUMBER: 15

LOCATION: TOWNSHIP 13 S RANGE 12 E SECTION 31 QUARTER NE
LATITUDE: N 32DEG 15MIN 48SEC LONGITUDE: W 111DEG 09MIN 20SEC
TOPO MAP NAME: AVRA - 7.5 MIN

CURRENT STATUS: PAST PRODUCER

COMMODITY:
COPPER SULFIDE
COPPER OXIDE
SILVER
GOLD LODE

BIBLIOGRAPHY:
AZBM BULL. 189, P. 84, 1974
AZBM BULL. 106, P. 6 & 18
AZBM BULL. 140, P. 98
AZ MINING JOURNAL, 10/1917 P. 22, 6/1918 P38
ADMMR "U" FILE CU 54
ADMMR GOULD MINE FILE

*Goled - Mils 16
Copper Bell - Mils 14
Columbia - Mils 13*

GOULD MINE

~~LOUIS CARRASCO~~
~~376 W. DISTRICT~~
~~TUCSON, ARIZONA~~

PIMA COUNTY

Louis Carrasco, 376 W. District, Tucson, Arizona, has sold Gould mine, sometimes called Columbia mine to Banner Mining Company. ALJ WR 3-31-58

BOARD OF GOVERNORS:
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DEPARTMENT OF MINERAL RESOURCES
STATE OF ARIZONA

J. S. COUPAL, PHOENIX
DIRECTOR

W. J. GRAHAM, PHOENIX
ASSISTANT TO THE DIRECTOR
AND SECRETARY TO THE
BOARD OF GOVERNORS

FIELD OFFICES AT
GLOBE - KINGMAN
PRESCOTT - TUCSON



Tucson, Arizona June 18, 1941

REPLY TO

Mr. Charles F. Willis
Arizona Dept. of Mineral Resources
Capitol Building
Phoenix, Arizona

Dear Mr. Willis:

Answering your letter of June 17th, we have mislaid copy of questionnaire we sent you. Will you kindly send us a copy immediately so that we may amend same also furnish you the additional information you asked for.

We will also send engineering report, which will show geology also a metallurgical and milling test made by the University of Arizona, this report is of recent date.

What we meant to say was 500 tons of ore per month which would run not lower than 4% possibly an average of 5% copper.

Very truly yours,

John Greenwood
John Greenwood

BOARD OF GOVERNORS:
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DEPARTMENT OF MINERAL RESOURCES
STATE OF ARIZONA
PHOENIX, ARIZONA
518 TITLE AND TRUST BUILDING



J. S. COUPAL, PHOENIX
DIRECTOR
W. J. GRAHAM, PHOENIX
ASSISTANT TO THE DIRECTOR
AND SECRETARY TO THE
BOARD OF GOVERNORS
FIELD OFFICES AT
GLOBE - KINGMAN
PRESCOTT - TUCSON

Tucson, Arizona,
August 19, 1941.

REPLY TO Box 841,
Tucson, Ariz.

Mr. J. S. Coupal, Director,
Department of Mineral Resources,
518 Title & Trust Building,
Phoenix, Arizona.

Dear Mr. Coupal:

Referring to the report of the Copper Bell
(Gould) mine which appears in the brief prepared by this de-
partment for the Arizona Copper Board, Mr. John Greenwood,
active owner is much distressed over the statement regard-
ing capital requirements correlated with price and tonnage
handled.

The data he furnished is doubtless garbled in the
report, and he would like a letter from you correcting the
two paragraphs on the top of the second page of this report:
as follows:

"The company is not operating at the present time and
a 14-cent price would be necessary to permit production on a com-
mercial basis. An investment of \$100,000 for hoisting, mining
and milling equipment would be necessary to place the mine on
a producing basis of 3,000 tons a month of 3-1/2% ore, all to
be milled before shipment to smelter."

The minimum price at which ore could be shipped direct
is estimated as 16 cents a pound, and at this price 500 tons a
month averaging 4 to 5% copper could be produced with a capital
investment of \$15,000. At 18 cents a pound, 1,000 tons a month
could be shipped averaging 3-1/2 to 4% with a capital invest-
ment of \$20,000 and if the price were 20 cents a pound the pro-
duction could be 3,000 tons a month averaging 3-1/2%..

To summarize, a plant investment of \$100,000 would per-
mit a production of approximately 2,000,000 pounds of copper a
year, if the price were 14 cents a pound, but the same tonnage
of copper could be produced on a plant investment of \$30,000
if the price were 20 cents a pound. A production of about 480,000
pounds a year could be made on an investment of \$15,000 and a price
of 16 cents a pound.

Will you kindly make an official correction as above so
Mr. Greenwood can paste it in his book? I'd like to have a
couple of copies for my books, too.

Sincerely,
Miss M. Cassette

August 20, 1941

Mr. John Greenwood
No. 1 Brady Court
40 E. 14th Street
Tucson, Arizona

My dear Mr. Greenwood:

From the additional and corrected data submitted please insert the following in place of the first two paragraphs on the second page of the report on the Copper Bell Mine in the Department of Mineral Resources brief on the Production Possibilities of the Marginal Copper Mines in Arizona.

The company is not operating at the present time and a 14-cent price would be necessary to permit production on a commercial basis. An investment of \$100,000 for hoisting, mining and milling equipment would be necessary to place the mine on a producing basis of 3,000 tons a month of 3-1/2% ore, all to be milled before shipment to smelter.

The minimum price at which ore could be shipped direct is estimated as 16 cents a pound, and at this price 500 tons a month averaging 4 to 5% copper could be produced with a capital investment of \$15,000. At 18 cents a pound, 1000 tons a month could be shipped averaging 3-1/2 to 4% with a capital investment of \$20,000 and if the price were 20 cents a pound the production could be 3,000 tons a month averaging 3-1/2%.

To summarize, a plant investment of \$100,000 would permit a production of approximately 2,000,000 pounds of copper a year, if the price were 14 cents a pound, but the same tonnage of copper could be produced on a plant investment of \$30,000 if the price were 20 cents a pound. A production of about 480,000 pounds a year could be made on an investment of \$15,000 and a price of 16 cents a pound.

Yours very truly,

J. S. Coupal

JSC:LP

August 20, 1941

Mr. Miles M. Carpenter
Box 841
Tucson, Arizona

Dear Miles:

In reply to your letter of August 19 I am returning a copy of the questionnaire which was submitted and signed by Mr. John Greenwood. I am also enclosing two copies of the letter I have just written Mr. Greenwood for insertion in his book in place of the two paragraphs mentioned.

You will note that the changes made do not correspond with the answers in the questionnaire insofar as the amounts of money required, nor is it clearly set forth that the tonnages mentioned at the 16¢, 18¢ and 20¢ prices are for shipment and the amount of capital required on a 14¢ price is for milling. Also, that it definitely states the price of copper to be 16¢ for this property to produce.

I hope these two items will satisfy Mr. Greenwood but know that the corrections cannot be made on all of the copies that have been distributed.

Very truly yours,

By J. S. Coupal

JSC:LP
Enc.

COPPER BELL (Gould)

Sept. 25, 1942

Tucson

George A. Ballam

Production Possibilities Survey

This property is situated in the Tucson Min. Dist. about 11 miles northwest of Tucson. It is owned by John Greenwood, Mgr., 40 E. 13th St., Tucson, Martin Waer, Elmer Dow and Abel Weinberg. There is a good road in to the property which is on the edge of the Tucson Park area. Ample water is available for all mining purposes.

Ore occurs as intrusions in limestone, values in copper as chalcocite with some bornite. Although no notable operations have been conducted for about 40 years, some 500,000 lbs. of copper have been produced in the past, shipments going to Globe and Sasco smelters, where this siliceous flux was desired.

Development consists of a 350' shaft with tunnel opening on 100' level; drifting and x-cuts on 200 and 300 levels; winze near shaft in tunnel also opening lower levels; and exposures of two parallel veins which have not been developed. There is water just below the tunnel level on the 100.

The owners wish to apply for a preliminary development loan. They have been confronted with a problem in this regard, since the old shaft is badly caved and it might not be practical to rehabilitate it. In 1940 about 100 tons of ore was taken out on the tunnel level next to the shaft. All of the timbering came in and considerable work will be involved in repairing it above the water, while it is reported caved below also. The owners were figuring on a new shaft at the tunnel portal to open the lower levels. However, the winze is in good condition and will enable access to all parts of the workings. I recommended that they merely apply for an unwatering loan, say it will cost \$1000 or \$1500 to unwater, and upon access and sampling future development may be decided upon.

The present reserves, estimated at about 100,000 tons, average about 4% copper. Yesterday I was informed by Campbell who had sampled the property in the past, that 25,000 tons of at least 4% copper ore can be taken out above the water at present. This, together with estimates of production contained in the Henderson report may be rather optimistic, as were the plans for a mill on the property. However, after spending some time in the workings, I believe substantial tonnage, say of 3 1/2% Cu content, to the amount of 25 tons per day of good milling ore could be sent to the Jacobs mill. Although Greenwood states that he faces no particular problems, he will undoubtedly run up against the usual labor and equipment shortages for larger operation. He has three or four men available for the proposed unwatering and repair work now, and can readily get one or two additional men for the smaller operation, in addition to two of his partners, one of whom is a good miner. Greenwood himself has had considerable mining experience. He can readily get together a crew of ten and for the immediate present - within the next six months - I believe a small operation is justified.

Signed: George Ballam

UNIVERSITY OF ARIZONA
Tucson

College of Mines
Arizona Bureau of Mines

COPY
February 12, 1942

METALLURGICAL TEST

Ore No. 612

The sample of this ore was submitted for test by Mr. John Greenwood of Tucson from the Gould Mine of the Copper Bell claims located approximately fifteen miles west of Tucson, with the request that a method of treatment be determined. The Arizona Bureau of Mines has no information relative to the tonnage of ore available in this mine, nor of the average grade of ore.

The sample was a heavy pyritic ore containing copper chiefly as chalcopyrite in a siliceous gangue. The analysis was as follows:

<u>% Copper</u>	<u>% Iron</u>
4.8	25.6

Liberation of the sulphide minerals from each other and from the gangue was practically complete at 100-mesh

Test No. 612A, grinding to approximately 100-mesh and using six pounds of lime per ton of ore was not successful, due to insufficient pyrite depression

Test No. 612B, with the same grind and ten pounds of lime per ton of ore was made as presented on following page and gave these results:

SUMMARY:

The results of the tests show that on ore of this character a copper extraction of 96.4 per cent may be expected in a concentrate containing 28.8 per cent of copper. At some sacrifice in extraction, this grade could probably be raised if it were desired. Grind should be to approximately 100-mesh. In addition to 10 lbs. of lime per ton, the only reagents required are 0.08 lb. of Ethyl Xanthate (z3) and 0.05 lb. of Dupont frother. Total flotation time was 13 minutes.

The Arizona Bureau of Mines

By: E. H. Crabtree, Jr.
Metallurgist.

Test No. 612B

	Wt. Grams	Dilution Water:Solids	Time-Min.	Reagents/lbs. per ton of ore.		
				Lime %	z	Frother
Grind	510	0.75/1	30	10.0	3	
1st Flotation		3/1	3	-	0.02	0.05
2nd "		"	5	-	0.02	-
3rd "		"	5	-	0.04	-

pH of tails 8.6
 Free CaO in tails 0.1 pound per ton of water
 Screen analysis of tails: 61.2% plus 100 mesh

Products

	Wt. Grams.	Tons in 100 tons feed	% Copper	% of Total Copper
Conc. No. 1	58.6	11.5	30.8	75.5
Conc. No. 2	15.2	3.0	27.0	17.3
Conc. No. 3	6.1	1.2	13.8	3.6
Tails	428.0	84.3	0.21	3.6
Calc. Heads	507.9	100.0	4.69	100.0
Assayed Heads		100.0	4.80	100.0

Compositing the above three concentrates into one concentrate, the products will be as follows:

	Tons in 100 Tons of Mill Feed	% Copper	% of Total Copper
Assayed Heads	100	4.80	100.0
Calculated Heads	100	4.69	100.0
Copper Conc.	15.7	28.8	96.4
Tails	84.3	0.21	3.6

June 19, 1941

Mr. John Greenwood
No. 1 Brady Court
40 East 14th Street
Tucson, Arizona

Dear Mr. Greenwood:

I have your letter of the 18th and we are sending you additional copies of the questionnaire. We hope that we will have the complete information on this property to include in our report. We trust that we will have an early reply, as we are going to have to get this report in to Washington by the end of the month and can only include the properties that we have data upon at that time.

Thanking you for an early reply, I am

Yours very truly,

Chairman, Board of Governors
Arizona Department of Mineral Resources

CFW:LP
Enc.

June 17, 1941

Mr. John Greenwood
No. 1 Brady Court
40 East 14th Street
Tucson, Arizona

Dear Mr. Greenwood:

I have your questionnaire regarding the Copper Bell Group. In answer to the question "How much copper could this property produce annually on a 16¢ price", you stated "500 tons a month". Do you mean tons of copper or tons of ore, and if you mean tons of ore we would have to know the average recoverable copper content in order to determine the amount of copper. We would greatly appreciate this information at an early date as we have to get this report in to Washington before the end of the month and we would like to include the Copper Bell.

Included within this report we anticipate putting a brief description of the properties which will be listed as potential producers. In order to have these brief reports uniform in their contents we have gotten up another questionnaire showing the points we want to cover, and it will be greatly appreciated if you will fill in one of these questionnaires for the Copper Bell Group and return it to us.

Thanking you and with kindest personal regards, I am

Yours very truly,

Chairman, Board of Governors
Arizona Department of Mineral Resources

CFW:LP
Enc.

Granted

COPPER BELL (Gould)

October 23, 1942

Tucson (Amole)

Earl F. Hastings

**Reconstruction Finance Corporation
Preliminary Development Loan**

Docket No.	C-ND-Phx 73
Date Application Received	October 19, 1942
Date of Field Examination	September 25, 1942
Date of Report	October 23, 1942

1. **Name and address of applicant (correspondent):**
John Greenwood, 40 East 14th Street, Tucson.
2. **Character of project and estimated cost thereof:**
To unwater, repair and prepare for sampling the main workings of this copper property, \$5,000.
3. **Location of property:**
Sections 31 and 36, T 13 S, R 12 E, Tucson (Amole) Mining District, 11 miles northwest of Tucson, Pima County, Arizona.
4. **Applicant's interest in or ownership of property:**
Applicant is one of four partners owning the property and applicant as an individual has obtained a lease and option from the partnership.
5. **Loan requested:**
\$5,000.
6. **Loan recommended:**
\$5,000.
7. **Comments:**
 - (A) **Added to the docket are:**
 1. Brief report by George A. Ballam, Field Engineer, Department of Mineral Resources, September 25, 1942.
 2. Metallurgical test by E. H. Crabtree, Jr., Metallurgist, Arizona Bureau of Mines, February 12, 1942.
 3. Report S. H. Gould, former operator, by Walter W. Wishon, Mining Engineer, Los Angeles, California, July 6, 1908.
 - (B) There are 53,000 tons plus of 3% ore indicated within the present confines of development, which would yield somewhat in excess of 3 million pounds of copper. Gold and silver values are negligible with a possible net return of \$1.30 per ton.
 - (C) Wishon refers to a probable new ore body which has been exposed by a drift eastward through a fault, and links this ore with that found in a shaft 600 feet to the east of the main shaft. This possibly removes the limit of ore to the east, and no mention is made of any limiting factor to the west; the 100 foot level westerly drift being reported in 20 feet plus of ore in the

October 23, 1942

heading. Considerable additional tonnage is therefore possible by lateral extension of development.

- (D) No reference is made to ore on the 300 foot level, and the Wishon report is inadequate in its explanation of the ore "dipping out of the winze" at approximately the 250 foot level. While it is possible that the 300 foot crosscut is short of the ore on this level, in the absence of reference to this point one wonders at the exact conditions prevailing there.
- (E) Whether or not the ore is limited in its downward continuation there appears sufficient evidence of existing developed ore to warrant this lean. Other veins and lateral extension from present workings on this vein offer possibilities for other ore zones of equal importance.

ARIZONA DEPARTMENT OF MINERAL RESOURCES

Earl F. Hastings, Assistant Director
and Projects Engineer

Wfe

COPPER BELL, John Greenwood, Mgr., Tucson, Arizona.

This property has had a negligible production in the past several years. Application to be made for a Preliminary Development Loan to make accessible workings now under water and which, it is claimed, indicates developed blocks totalling 100,000 tons of ore.

Workings now accessible above the water level indicate a possible 25,000 tons of $3\frac{1}{2}\%$ Cu. ore immediately available. This can be produced at a rate of 25 tons per day and treated in the custom plant of the Tucson Ore Milling Co. This would yield approximately 45,000 pounds of copper per month.

Proving of anticipated ore zones under water would make possible consideration of a reduction plant on the premises which would, at the rate of 100 tons per day, produce approximately 180,000 pounds of copper per month.

Report of Earl F. Hastings, October 9, 1968, to Copper Branch, War Production Board.

DEPARTMENT OF MINERAL RESOURCES

STATE OF ARIZONA

FIELD ENGINEERS REPORT

Mine Gould Mine Date October 23, 1959
District Amole District, Pima County Engineer Axel L. Johnson
Subject: Field Engineers Report. Information from F. D. MacKenzie, Geologist, Banner Mining Co. & Personal Visit.

Reference: Reports of March 2, 1954 & May 17, 1954 under name of "Columbia Mine (formerly called Gould Mine)." Larry Drake, the lessee at that time, called it "Columbia Mine." 1902 Irene Vista, Tucson, Arizona - ALJ WR 1-21-61

Location: See report of Mar. 2, 1954.

Number of Claims: 12 unpatented claims acquired by Banner Mining Co. from the former owners. State leases in Sec. 36, T. 13 S., R. 11 E. and in Sec. 32, T. 13 S., R. 12 E. issued to Banner Mining Co.

Owners: Banner Mining Co. on the 12 unpatented claims.

Lessees: Banner Mining Co. on the State leases.

Principal Minerals: Copper ores. Minerals are chalcopyrite, bornite, secondary chalcocite, pyrite, garnet and quartz. Only a small amount of oxidized copper ore is found near the surface.

Present Mining Activity: None. Banner Mining Co. is awaiting the decision of the Dept. of the Interior regarding the proposed opening of the mineralized area in Tucson Mt. Park for mining before starting any exploration work on their holdings.

Geology & Mineralization: According to Mr. MacKenzie, this is a contact metamorphic deposit, the ore being deposited along the contact of a granite intrusive to the north, and sedimentary beds of arkose, graywackes, shales and limestones to the south. The sedimentary beds dip S-SW from 60 to 70 degrees, and the contact runs approximately E and W, nearly at right angles to the dip of the sedimentary beds. Mr. MacKenzie estimates that the mineralized area, containing commercial ore, is about 30 ft. wide. See report of March 2, 1954 for a quotation from the geological report of W.W. Wishon, mining engineer, Los Angeles, Calif. of July 6, 1908.

Ore Values: Mr. MacKenzie expressed the belief that the ore will average from 3 to 4% in copper.

See report of March 2, 1954 for smelter returns on 4 carloads of ore shipped to the International Smelter at Miami, Ariz. and also smelter returns of 1000 tons of ore shipped to the Old Dominion smelter at Globe prior to 1908.

Ore in Sight & Probable See report of March 2, 1954.

Milling & Marketing Facilities: " " " " "

Past History and Production: " " " " "

Old Mine Workings: The workings open for examination during our visit on Oct. 23, 1959 were viz:

- (1.) One vertical shaft about 30 ft. deep
- (2.) One drift from same about 250 ft. long
- (3.) A few small stopes on sides and above said drift
- (4.) One winze (incl. 66°) about 55 ft. deep

Gould Mine (cont.)

Evidently this is only a small part of the original workings of the mine.

See report of March 2, 1954 for an estimate of the old mine workings by Larry Drake.

Present Mine Workings: The 30 ft. vertical shaft and the 250 ft. drift from same, which we examined on Oct. 23, 1959, have been repaired by the Banner Mining Co. The drift, and the stopes adjacent and above this drift, have also been sampled.

Present Mining Operations: None

Proposed Plans: If this area is opened by the Dept. of Interior for mining operations, the Banner Mining Co. plans to do extensive exploration work by means of diamond drilling and repairs and sampling of the old mine workings.

DEPARTMENT OF MINERAL RESOURCES
STATE OF ARIZONA
FIELD ENGINEERS REPORT

Page 1.

Mine Columbia Mine (formerly called Gould Mine) Date March 2, 1954 & May 17, 1954.

District Amole District, Pima County

Engineer Axel L. Johnson

Subject: Field Engineer's Report.

Location Sec. 31 -- T 13 S -- R 12 E and Sec. 36 -- T 13 S -- R 11 E.
Go out from Tucson on the Ajo Road and turn to the right into Tucson Mountain park. Continue to about one mile past Old Tucson, and then turn left at road marked "Truck Route". Go 4 miles west on truck route. Road is in good condition.

The mine is not in the Tucson Park area, but on some Government leased land. Operators were required to get permission from the County Board of Supervisors before engaging in mining operations.

Number of Claims 12 unpatented claims.

Owners Martin Waer, Elmer Dow, Ed Brady, Louis Carrasco, and Gilbert Waer, Tucson, Ariz.

Lessees and Operators Larry Drake, 3841 N. Park Ave., Tucson, Ariz. --¹/₂-- Manager, and 3 partners, doing business as the L. B. D. M. Mining Co. 10 year lease--10 % royalty.

Principal Minerals Ores of Copper. The ores are sulphide ores---usually chalcopyrite in association with garnet and a lot of pyrite and quartz. Some bornite also present.

Number of Men Employed None at present. 6 men employed from Nov. 1, 1953 to Mar. 1, '54.

Production Rate None at present. 4 carloads shipped from Nov. 1, 1953 to Mar. 1, 1954.

Geology Report of W. W. Wishon, Mining Engineer, Los Angeles, Calif.---July 6, 1908., viz: "Contact copper ore deposit, consisting of limestone, highly metamorphosed, in contact with granite porphyry---fissured or intruded by quartz-porphyry intrusions, resulting in garnetization and mineralization of the limestone in the form of lodes occurring in approximately parallel lines along or near the contact. 3 large mineralized veins traverse the property for its entire length of 4800 ft. Veins are from 30 to 50 ft. wide".

Ore Values According to Larry Drake, Manager, the returns from the 4 carloads of ore shipped to the International Smelter, Miami, Ariz. were as follows:- 2.28 %, 1.76 %, 1.98 %, and 2.21 %, or an average for the 4 cars of 2.06 %. Mr. Drake says that this was mine run, with no hand sorting, and is of the opinion that the grade can be increased to 4 or 4 1/2 % with proper hand sorting. According to the report of W. W. Wishon of July 6, 1908, the assays by the Old Dominion Smelter at Globe of all the ore shipped to them (approx. 1,000 tons) were as follows:- Copper -- 3.2 %; Silica -- 26 %; Iron -- 25.1 %; Aluminum -- 1.26 %; Lime -- 13.2 %; Sulphur -- 19 %; Gold and Silver below payment scale.

Ore in Sight and Probable W. W. Wishon's report of July 6, 1908, referred to above, states, "Estimated available commercial ore aggregates 100,000 tons". This estimate, evidently, was based on examination of the shafts and underground workings, which at that time were open. Now, practically all these old workings are caved, under water, and inaccessible. Making this ore again available for production and shipment will require a large expenditure for development. At the present time, the open workings consist of 100 ft. of repaired shaft, 15 ft. of drifting, and 8 ft. of cross cutting, with "ore in sight" very limited. The drift and cross cut is in ore, but the ore limits have not been determined.

DEPARTMENT OF MINERAL RESOURCES

STATE OF ARIZONA

FIELD ENGINEERS REPORT

Page 2.

Mine Columbia Mine (formerly called Gould Mine) Date March 2, 1954 & May 17, 1954.

District Amole District, Pima County

Engineer Axel L. Johnson

Subject: Field Engineer's Report (continued from page 1)

Milling and Marketing Facilities Operators have been shipping the ore to the International Smelter at Miami, Ariz. The results to date (2.06 % average) would cause one to believe that they have been operating at a loss. Mr. Drake believes that the ore mined can be up-graded to 4 or 4 1/2 % by hand sorting. However, it would seem that the large amount of fines in the ore, and also the large amount of pyrite mixed in with the ore, would make hand sorting very difficult and costly. The writer believes that a mill for milling this ore is essential in order to maintain a profitable operation. Before such a mill is constructed, the old workings of the mine should be dewatered and repaired, and, possibly, additional development work should be done, in order to assure sufficient ore reserves to warrant the expenditure for a mill.

Past History (1) Mine is reported to have been worked from 1887 to 1909. Arizona Bureau of Mines Bulletin # 140, page 98, under 'Gould Mine' reports ~~and~~ approximate production of 45,000 pounds of Copper.

(2) News article of April 29, 1915 reads as follows: "10 claims of the Gould Copper Co. were sold by Under Sheriff W. Sullinger yesterday to satisfy a judgment on a mortgage to amount of \$31,239. Bid in for \$30,000."

(3) News article of Aug. 20, 1916 reads as follows: "Douglas Gray of Tombstone, Ariz. bought and took over the Gould Mines".

(4) Report of George A. Ballam on June 15, 1942 showed that the property was then owned by John Greenwood, 40 East 14th Street, Tucson, Ariz. He also reports that several cars of ore had been shipped to the International Smelter, Miami, Ariz., running from 3 1/2 to 5 % Copper, but that the mine was inactive as of June 15, 1942.

(5) Present owners have held the property for about 10 years. As far as can be learned, the mine was inactive during this time, until it was leased to the present operators, who began mining operations some time in October or November, 1953.

Old Mine Workings (1) 1 vertical shaft --- 360 ft. deep, with drifts and cross cuts on the 100 ft., the 200 ft., and the 300 ft. levels, and a 100 ft. winze from the 100 ft. level. These workings, except for about 100 ft. of the shaft, are now all flooded, caved, and inaccessible. Mr. Larry Drake states that he has been informed by good authority that there is approximately 1,650 ft. of drifts and cross cuts on the three levels of the mine.

(2) 1 -- 50 ft. shaft.

(3) 1 -- 70 ft. adit.

(4) Several open cuts and shallow shafts

Present Mine Workings Present operators erected a head frame, repaired the old shaft down a distance of about 100 ft., repaired and cleaned out the 100 ft. station, and did about 15 ft. of drifting and about 8 ft. of cross cutting. They also did some stoping from these workings, and shipped 4 carloads of ore to the International Smelter at Miami.

Proposed Plans Lessees and operators would like to sell or sub-lease the property to some large producer, who has the financial resources to develop the property into ore production on a large scale, and to erect a mill for milling the ore.

DEPARTMENT OF MINERAL RESOURCES
STATE OF ARIZONA
FIELD ENGINEERS REPORT

Mine Copper Bell (Gould)

Date Sept. 25, 1942

District Tucson

Engineer George A. Ballam

Subject: Production Possibilities Survey

This property is situated in the Tucson Min. Dist. about 11 miles northwest of Tucson. It is owned by John Greenwood, Mgr., 40 E. 13th St, Tucson, Martin Waer, Elmer Dow and Abel Weinberg. There is a good road in to the property which is on the edge of the Tucson Park area. Ample water is available for all mining purposes.

Ore occurs as intrusions in limestone, values in copper as chalcocite with some bornite. Although no ^{metallic} operations have been conducted for about 40 years, some 500,000 lbs. of copper have been produced in the past, shipments going to Globe and Sasco smelters, where this siliceous flux was desired.

Development consists of a 350' shaft with tunnel opening on 100' level; drifting and x-cuts on 200 and 300 levels; winze near shaft in tunnel also opening lower levels; and exposures of two parallel veins which have not been developed. There is water just below the tunnel level on the 100.

The owners wish to apply for a preliminary development loan. They have been confronted with a problem in this regard, since the old shaft is badly caved and it might not be practical to rehabilitate it. In 1940 about 100 tons of ore was taken out on the tunnel level next to the shaft. All of the timbering came in and considerable work will be involved in repairing it above the water, while it is reported caved below also. The owners were figuring on a new shaft at the tunnel portal to open the lower levels. However, the winze is in good condition and will enable access to all parts of the workings. I recommended that they merely apply for an unwatering loan, say it will cost \$1000 or \$1500 to unwater, and upon access and sampling future development may be decided upon.

The present reserves, estimated at about 100,000 tons, average about 4% copper. Yesterday I was informed by Campbell who had sampled the property in the past, that 25,000 tons of at least 4% copper ore can be taken out above the water at present. This, together with estimates of production contained in the Henderson report may be rather optimistic, as were the plans for a mill on the property. However, after spending some time in the workings, I believe substantial tonnage, say of 3 $\frac{1}{2}$ % Cu content, to the amount of 25 tons per day of good milling ore could be sent to the Jacobs mill. Although Greenwood states that he faces no particular problems, he will undoubtedly run up against the usual labor and equipment shortages for larger operation. He has three or four men available for the proposed unwatering and repair work now, and can readily get one or two additional men for the smaller operation, in addition to two of his partners, one of whom is a good miner. Greenwood himself has had considerable mining experience. He can readily get together a crew of ten and for the immediate present - within the next six months - I believe a small operation is justified.

Geo A Ballam

DEPARTMENT OF MINERAL RESOURCES
STATE OF ARIZONA
FIELD ENGINEERS REPORT

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Geo. A. Ballam

Return

~~George W. Purcell, M.D.~~
~~TUCSON, ARIZONA~~

UNIVERSITY OF ARIZONA

Tucson

College of Mines
Arizona Bureau of Mines

COPY

February 12, 1941

METALLURGICAL TEST

Ore No. 612

The sample of this ore was submitted for test by Mr. John Greenwood of Tucson from the Gould Mine of the Copper Bell claims located approximately fifteen miles west of Tucson, with the request that a method of treatment be determined. The Arizona Bureau of Mines has no information relative to the tonnage of ore available in this mine, nor of the average grade of the ore.

The sample was a heavy pyritic ore containing copper chiefly as chalcopyrite in a siliceous gangue. The analysis was as follows:

<u>% Copper</u>	<u>% Iron</u>
4.8	25.6

Liberation of the sulfide minerals from each other and from the gangue was practically complete at 100-mesh

Test No. 612A, grinding to approximately 100-mesh and using six pounds of lime per ton of ore was not successful, due to insufficient pyrite depression

Test No. 612B, with the same grind and ten pounds of lime per ton of ore was made as presented on following page and gave these results:

~~GEORGE W. PURCELL, M.D.~~

~~TUCSON, ARIZONA~~

Test No. 612B

	Wt.	Dilution	Time-Min.	Reagents/lbs. per ton of ore.		
	Grams	Water:Solids		Lime	Z	Frother
Grind	510	0.75/1	30	10.0	3	
1st Flotation		3/1	3	-	0.02	0.05
2nd "		"	5	-	0.02	-
3rd "		"	5	-	0.04	-

pH of tails 8.6

Free CaO in tails 0.1 pound per ton of water

Screen analysis of tails: 61.2% plus 100 mesh

Products

	Wt.	Tons in		% Copper	% of Total Copper
	Grams	100	tons feed		
Conc No. 1	58.6		11.5	30.8	75.5
Conc No. 2	15.2		3.0	27.0	17.3
Conc No. 3	6.1		1.2	13.8	3.6
Tails	428.0		84.3	0.21	3.6
Calc. Heads	507.9		100.0	4.69	100.0
Assayed Heads			100.0	4.80	100.0

Compositing the above three concentrates into one concentrate, the products will be as follows:

	Tons in 100 Tons		% Copper	% of Total Copper
	of Mill Feed			
Assayed Heads	100		4.80	100.0
Calculated Heads	100		4.69	100.0
Copper Conc.	15.7		28.8	96.4
Tails	84.3		0.21	3.6

~~GEORGE W. PARCELL, M.D.~~

~~BURO OF MINES~~

SUMMARY

The results of the tests show that on ore of this character a copper extraction of 96.4 per cent may be expected in a concentrate containing 28.8 per cent of copper. At some sacrifice in extraction, this grade could probably be raised if it were desired. Grind should be to approximately 100-mesh. In addition to 10 lbs. of lime per ton, the only reagents required are 0.08 lb. of Ethyl Xanthate (23) and 0.05 lb. of Dupont frother. Total flotation time was 13 minutes.

The Arizona Bureau of Mines

By: E. H. Crabtree, Jr.
Metallurgist.

Copper Bell

Revised

COPY

WALTER W. WISHON
MINING ENGINEER
LOS ANGELES, CALIF.

S. H. GOULD
PRESIDENT AND GENERAL MANAGER
GOULD COPPER MINING COMPANY

SIR:

I HAVE THE HONOR TO HAND YOU THE FOLLOWING REPORT ON YOUR PROPERTY WITH MAPS AND CROSS SECTIONS TO DEFINE AND ILLUSTRATE IT.

LOCATION, AREA, ETC.

THE MINING ESTATE OF THE GOULD COPPER MINING COMPANY LIES IN ALMOST A SOLID BODY, WITHOUT ANY INTERVENING CLAIM, IN A GENERAL RECTANGULAR FORM, IN THE TUCSON MINING DISTRICT, PIMA COUNTY, ARIZONA, DISTANT ABOUT ELEVEN MILES WEST OF TUCSON, THE COUNTY SEAT AND TRADING POINT.

THE ELEVATION IS APPROXIMATELY 3,400 FEET ABOVE SEA LEVEL AND RANGES FROM 400 TO 1,000 FEET ABOVE SURROUNDING VALLEY.

THE AREA EMBRACED IN THE PROPERTY IS APPROXIMATELY 210 ACRES ALL FULLY SURVEYED AS PER TOPOGRAPHICAL MAP HEREWITH.

GEOLOGY

THE GEOLOGY IS OF THE USUAL TYPE OF ARIZONA CONTACT COPPER ORE DEPOSITS, CONSISTING OF INTERBEDDED MAGNESIUM LIMESTONE, HIGHLY METAMORPHOSED, IN CONTACT WITH GRANITE-PORPHYRY, ON THE NORTH SIDE OF THE PROPERTY, ALONG THE CREST OF THE MOUNTAIN UPLIFT. THIS CONTACT SERIES HAS BEEN FISSURED, FAULTED OR INTRUDED AND PARTIALLY OVERFLOWED BY THE OUT-POURINGS OF THE QUARTZ-PORPHYRITES, RESULTING IN THE "GARNETIZATION" OF THE SEDIMENTARY ROCKS AND THEIR MINERALIZATION IN THE FORM OF LODGES OR REEFS, WHICH OCCUR IN APPROXIMATELY PARALLEL LINES ALONG AND NEAR THE PLANES OF CONTACT. EPIDOTE ALSO OCCURS WITH THE GARNET; IN FACT, BOTH ARE COMMON ASSOCIATES OF COPPER ORES IN THE SOUTHWEST.

THE GREAT MOUNTAIN UPLIFT OF ABOUT 1000 FEET VERTICAL HAS BROKEN THE INTERBEDDED LIMESTONE FORMATION, AS SHOWN BY THE BEDDING PLANES OF THE REMAINING MASS, WHICH, ALTHOUGH MINERALIZED TO A MARKED DEGREE AS SHOWN BY ITS DECOMPOSED EPIDOTE REEFS, YET IT SHOWS NONE OF THE HUGE GARNET OUTCROPS, LODGE-LIKE IN CHARACTER, WHICH APPEAR IN GREAT LENTICULAR MASSES HERE AND THERE ALONG THEIR STRIKE, AS IN THAT OF THE GREAT MOUNTAIN UPLIFT. IT IS IN THIS AREA OF GREATEST ACTIVITY THAT THREE LARGE MINERALIZED REEFS, OR VEINS, TRAVERSE THE PROPERTY FOR ITS ENTIRE LENGTH OF ABOUT 4800 FEET, AS SHOWN ON MAP HEREWITH. ON THE WEST END OF THE PROPERTY THESE REEFS APPROACH EACH OTHER, WHERE, ON THE SIERRA ARRIBA CLAIM, THE EPIDOTE GARNET MASS BECOMES EXTREMELY LARGE IN CONSEQUENCE, AND THE COPPER MINERALIZATION OF GREATER VALUE THAN USUALLY FOUND ELSEWHERE, NOTED ON THE SURFACE, ALTHOUGH ALL THE REEFS ARE COPPER-BEARING AND HAVE THE SEMBLANCE OF REGULAR LODGES.

MINERALOGY

THE COPPER ORE IS FOUND IN THE FORM OF CHALCOPYRITE, USUALLY CHALCOPYRITE, DISSEMINATED IN THE MIDDLE OF THE GARNET, IN GRAINS, STRINGERS AND OFTEN IN NODULAR MASSES, ASSOCIATED WITH MUCH IRON SULPHIDE, LIME BEAR AND SOME QUARTZ. IN SOME INSTANCES THE CHALCOPYRITE HAS YIELDED TO THE SECONDARY MINERAL, BORNITE, WHICH IS FOUND SCATTERED HERE AND THERE THROUGHOUT THE GREAT MASS, THEREBY BRINGING THE COPPER BEACHTH ARE UP TO A MARK THAT ALLOWS OF GREAT WIDTHS, IN THESE HUGE LODGES, TO BE MINED AND SMELTED AT A PROFIT. THIS IS ALSO DUE TO THE RATIO OF PREDOMINATING GANGUE MATERIAL, ALSO BEING SO LARGELY BASIC IN NATURE AS TO ADMIT OF FLUXING SILICIOUS ORES, IN WHICH THE VEINS OF THE SURROUNDING COUNTRY ABUND.

DEVELOPMENT

THE VEINS HAVE AN EAST-WEST STRIKE AND DIP NORTHERLY INTO THE MOUNTAIN AT AN ANGLE OF ABOUT 60 DEGREES FROM THE HORIZONTAL.

THE CHIEF DEVELOPMENT CONSISTS OF A WORKING SHAFT WITH MANWAY, 360 FEET IN DEPTH, ON COPPER MINE CLAIM No. 5, WITH CROSS-CUTS AND DRIFTS ON THE 100 FOOT LEVEL, 200 FOOT LEVEL AND THE 300 FOOT LEVEL, AS PER MAP SHOWING HORIZONTAL AND VERTICAL PROJECTIONS HERewith. THERE IS ALSO A WINZE FROM THE 200 FOOT LEVEL TO THE 300 FOOT LEVEL AND A CROSS-CUT SHOWN ON MAP SOUTH FROM SHAFT ON THE 200 FOOT LEVEL WHICH SHOWED MUCH IRON PYRITE, ASSAYING ABOUT ONE-HALF PER CENT COPPER, BUT IT PRODUCED SO MUCH WATER THAT A PUMP WOULD BE REQUIRED HENCE IT WAS BULKHEADED TO STOP THE FLOW.

ABOUT 600 FEET EAST OF THE MAIN SHAFT AND 60 FEET LOWER, ON COPPER MINE No. 1 CLAIM, THERE IS A 50 FOOT SHAFT ON THE SAME VEIN OF THE MAIN WORKING SHAFT. THIS SHAFT IS ALL IN ORE. ABOUT 700 FEET NORTHERLY FROM THIS 50 FOOT SHAFT, AND ON THE SECOND PARALLEL VEIN ON COPPER MINE CLAIM IS A CROSS-CUT TUNNEL 70 FEET IN LENGTH WHICH, ALTHOUGH BUT AN APEX CROSS-CUT, IS ALL IN ORE. THE CROPPINGS HERE AND IMMEDIATELY TO THE EAST ARE HUGE. FROM THIS 70 FOOT CROSS-CUT AND FROM THE 50 FOOT SHAFT ALREADY MENTIONED, 30 TONS OF ORE WAS SELECTED AND SHIPPED TO THE EL PASO SMELTER, WHICH SAMPLED 8.6% COPPER, 5.0 SILVER AND \$1.50 GOLD PER TON. ABOUT 90 FEET VERTICALLY BELOW THE 70 FOOT CROSS-CUT TUNNEL, ABOVE MENTIONED, A TUNNEL OF LIKE LENGTH IS NOW BEING DRIVEN TO CROSS-CUT THE LEDGE, BUT IT HAS NOT YET ENTERED THE LEDGE.

ON THE INVINCIBLE CLAIM IS A 10 FOOT SHAFT, SUNK ON THE WESTERN EXTREMITY OF A VERY LARGE GARNET OUTCROP, WHICH SHOWS VERY FINE PYRITE, MUCH RESEMBLING MARCASITE, ESPECIALLY THROUGHOUT THE GANGUE AT AND NEAR THE BOTTOM OF THE SHAFT, AND ASSAYING ABOUT 1-1/2% COPPER.

ON THE SIERRA ARRIBA CLAIM IS A 10 FOOT SHAFT AND A 20 FOOT TUNNEL; ON THE GREENWICH CLAIM IS A 20 FOOT SHAFT. THE SIERRA ARRIBA CLAIM AND THE INVINCIBLE CLAIM HAVE THE MOST WONDERFUL CROPPINGS OF THE ENTIRE PROPERTY, BOTH AS TO SIZE AND QUALITY, ALTHOUGH OTHER LARGE LENSES ALSO APPEAR AT INTERVALS ALONG EACH OF THE VEINS, BUT THE MINERALIZATION APPEARS BETTER IN THE VEINS NEAREST THE GRANITE PORPHYRY CONTACT AND ALSO AS THEY APPROACH EACH OTHER IN THE WESTERN EXTREMITY OF THE PROPERTY.

IT IS, THEREFORE, MY JUDGMENT THAT THE MAIN 360 FOOT WORKING SHAFT BEFORE MENTIONED HAS BEEN SUNK UPON THE LEANEST VEIN THEREOF, BEING THE THIRD AND POSSIBLY THE FOURTH VEIN FROM THE GRANITE PORPHYRY CONTACT, YET AT A DEPTH OF 50 FEET ORE WAS ENCOUNTERED WHICH HAD EVIDENTLY LEACHED AND RECONCENTRATED, AS IT ASSAYED 17% COPPER. AT A DEPTH OF 113 FEET AND KNOWN AS THE 100 FOOT LEVEL THE SHAFT SUNK VERTICALLY ENCOUNTERED THE FOOT-WALL AND A CROSS-CUT AT THE HORIZON PROVED A WIDTH OF 30 FEET OF ORE. A DRIFT WESTERLY UPON IT SHOWS ORE OF GOOD COMMERCIAL VALUE, ITS ENTIRE LENGTH OF 75 FEET. THE FACE AT THAT POINT IS 20 FEET WIDE WITH NEITHER WALL SHOWING. EAST FROM THE SHAFT THE ORE BODY GIVES WAY TO MASSIVE IRON PYRITE IN A VERY SOFT GANGUE AND A LITTLE FURTHER EAST THE VEIN IS FAULTED, WHICH HAS BEEN CROSS-CUT AND EVIDENTLY A NEW BODY IS FOUND JUST COMING INTO THE PRESENT FACE. THIS ORE IS BELIEVED TO BE THE SAME AS THAT ENCOUNTERED IN THE BOTTOM OF THE 50 FOOT SHAFT TO THE EAST.

THE CROSS-CUT ON THE 200 FOOT LEVEL SHOWS THE ORE BODY TO BE ABOUT 50 FEET IN WIDTH WHICH HAS BEEN DRIFTED UPON WESTERLY ABOUT 60 FEET. THE COPPER VALUE APPEARS TO BE LESS ON THIS PARTICULAR PORTION OF THE 200 FOOT LEVEL THAN THAT ON THE 100 FOOT LEVEL, BUT IN THE EAST DRIFT AN UPRaise, AS WELL AS THE WINZE FOR 50 FEET IN DEPTH, SHOWS QUITE HIGH GRADE ORE. AS SHOWN ON MAP HERewith THE WINZE IS SUNK ON THE ORE TO THE 250 FOOT LEVEL AT WHICH POINT THE ORE DIPS OUT OF THE WINZE AS IT THERE CHANGES VERTICALLY TO THE 300 FOOT LEVEL IN ORDER TO USE IT FOR A CHUTE. TWO DRIFTS HAVE BEEN STARTED WESTERLY FROM THE WINZE, ABOUT THE 250 FOOT LEVEL, BOTH SHOWING HIGH GRADE ORE, WHICH TENDS TO PROVE THAT THE LARGE MASS OF LOW GRADE ORE ENCOUNTERED TO THE WEST ON THE STILL FLOOR OF THE 200 FOOT LEVEL IS DUE ENTIRELY TO A "HORSE" OR A MUCH HARDER VEIN MATERIAL WHICH WAS MORE DIFFICULT FOR THE ORE NEARING SOLUTION TO PENETRATE. WHILE THE VALUES IN THE "HORSE" OR VAST MASS OF HARDER VEIN MATERIAL ON THE 200 FOOT LEVEL WILL PROBABLY NOT AVERAGE MORE THAN 2% COPPER, YET THE ORE DISCLOSED IN THE UPRaise AND THE WINZE WILL AVERAGE FULLY 5% COPPER.

IT IS QUITE A DIFFICULT MATTER TO OBTAIN A FAIR SAMPLE OF THE ORE BODIES WITHOUT ACTUALLY MINING, HENCE I HAVE TAKEN AS AN AVERAGE THE ENTIRE ORE BODIES SO FAR OPENED, THE AVERAGE ASSAYS AS FOUND BY THE OLD DOMINION SMELTER OF GLOBE, ARIZONA, IN SAMPLING THE 100 TONS OF ORE SHIPPED JUST AS MINED TO THEM AND WITH INSTRUCTIONS

FROM THE SMELTER PEOPLE TO KEEP THE ORE AS LOW AS POSSIBLE IN COPPER, BUT ON THE OTHER HAND AS HIGH IN BASIC ELEMENTS AND SULPHUR AS POSSIBLE AS THEY DESIRED IT FOR FLUX AND MATTE FALL CHIEFLY. THIS AVERAGE OF ANALYSIS IS: COPPER, 3.2%; SILICA, 26.0%; IRON, 25.1%; ALUMINA, 1.26%; LIME (CAO) 13.2%; SULPHUR, 19.0%. THE GOLD AND SILVER VALUES BEING BELOW THEIR SCALE OF \$1.00 GOLD AND 2.0 SILVER, NO RECORD OF THESE VALUES WAS GIVEN. HOWEVER, FROM NUMEROUS ASSAYS TAKEN WHILE THE ORE WAS BEING SHIPPED, IT IS SAFE TO SAY THAT ORE OF THIS LOW COPPER GRADE WILL AVERAGE ABOUT \$.60 AND 1.5 OZ. SILVER PER TON.

OWING TO THE GREAT DEMAND FOR ORE OF THIS CHARACTER, THAT COMPANY NOW OFFERS FOR THIS ORE \$0.08 PER UNIT FOR THE IRON, LIME AND SULPHUR PERCENTAGES, OR 57.3 UNITS.

TOTAL AT 8 CTS.	\$4.58	
COPPER ON ELECTROLYTIC ASSAY LESS 2-1/2% FROM N.Y.		
ELECTROLYTIC QUOTATIONS \$2.00 PER UNIT	6.40	\$10.98
FROM WHICH DEDUCT 10% PER UNIT FOR SILICA PERCENTAGE		
ABOVE 20%, 6 UNITS60	
SMELTING CHARGE, NIL. RAILWAY CHARGE FOR FREIGHT	2.00	2.60
LEAVING A NET SMELTER VALUE OF		8.38
FROM WHICH DEDUCT: WAGON HAUL OF \$3.00 AND COST OF MINING WHICH IN ORE BODIES OF THIS MAGNITUDE WILL BE FROM \$1.00 TO \$2.00 PER TON, TOTAL		5.00
LEAVING A NET PROFIT OF		3.38

IT IS THEREFORE APPARENT THAT THE ERECTION OF A SMELTING PLANT UPON THE PROPERTY IS IMPERATIVE, AND THEREFORE, A SMELTER SITE HAS BEEN PROVIDED BY THE COMPANY AT THE FOOT OF THE MOUNTAIN, ABOUT THREE-FOURTHS OF A MILE DISTANT FROM THE MAIN WORKING SHAFT, WHICH IS ADMIRABLY ADAPTED FOR THAT PURPOSE.

THE ORE IS BEST ADAPTED FOR TREATMENT IN THE BLAST FURNACE TYPE OF NOT LESS THAN 500 TONS UNITS. IN THE FIRST SMELTING THE AVERAGE ORE OF SAY 3.0% COPPER VALUE WILL PRODUCE ABOUT A 17.0% MATTE; THE SECOND SMELTING ABOUT A 50% MATTE; AND BY USING THE SEMI-PYRITIC PROCESS, AS NOW USED AT THE WASHOE SMELTING PLANT OF THE ANACONDA COMPANY OF MONTANA, ORE OF THIS CHARACTER CAN BE TREATED WITH LESS THAN 3% COKE ON THE CHARGE. BY PROVIDING CONVERTERS, THE PRODUCE WILL BE BLACK, OR BLISTER COPPER, ASSAYING FROM 96% TO 98% COPPER, WHICH MAY BE CAST DIRECT IN CATHODE FORM FOR SHIPMENT TO THE REFINERY.

GENERAL

AS BEFORE STATED THE FLUXING QUALITY OF THIS ORE IS SUCH THAT THE SILICIOUS ORES OF THE SURROUNDING DISTRICT CAN BE TREATED THEREWITH. THESE ARE NOW PAYING A SMELTING CHARGE AT EL PASO FROM \$10 TO \$12 PER TON. BY FLUXING WITH THESE ORES TO THEIR LIMIT AND CHARGING EL PASO RATES, THE ORES OF THE GOULD COPPER MINING COMPANY CAN BE BOTH MINED AND SMELTERED WITHOUT COST AS TO ITS OWN ORES, AND IN ADDITION SAVE TO THE SELLERS OF SILICIOUS ORES THE MINIMUM FREIGHT HAUL OF \$2.00 PER TON TO THE EL PASO PLANT. THE ENTIRE SURROUNDING COUNTRY IS KNOWN TO BE RICH IN SILICIOUS ORES AND THE ERECTION OF THIS PLANT WOULD GREATLY STIMULATE THEIR PRESENT OUTPUT.

LOOKING WESTERLY FROM THE GOULD COPPER COMPANY'S PROPERTY ONE CAN SEE THE NEW SASCO SMELTER WITH ITS TWO UNITS OF 350 TONS EACH AND ITS ADJACENT MINING PROPERTY, THE SILVER BELL, WHICH NOW HAS A DEPTH OF 1200 FEET.

DURING THE DEVELOPMENT OF AND WHILE BUILDING A REDUCTION PLANT ON THE GOULD PROPERTY THE SASCO SMELTER COULD BE UTILIZED TO GREAT ADVANTAGE BY BUILDING A BRUR TRACK OF ABOUT 12 MILES FROM THE WEST END OF THE PROPERTY TO THE MAIN LINE OF THE SOUTHERN PACIFIC RAILWAY WHICH WOULD GIVE ALL RAIL CONNECTIONS WITH THE SMELTER WITH A FREIGHT CHARGE OF PROBABLY 50% PER TON. AS STATED BEFORE, THIS WEST END OF THE GOULD PROPERTY NOT ONLY HAS A WONDERFUL SURFACE SHOWING FOR COPPER BUT IT CAN BE TUNNELLED TO GREAT ADVANTAGE AND THE ENTIRE SYSTEM OF VEINS ECONOMICALLY WORKED THEREFROM.

THE GEOLOGICAL CONDITION OF THE GOULD AND SILVERBELL PROPERTIES ARE SIMILAR IN MANY RESPECTS, EXCEPT THAT OF THE SILVERBELL IS MORE CRUSHED AND BROKEN, YET THEIR ORE BODIES, LIKE THAT OF THE GOULD PROPERTY, CARRIED LOW COPPER PERCENTAGES IN THEIR UPPER HORIZONS, BUT THIS VALUE HAS GRADUALLY ENHANCED AS DEPTH WAS ATTAINED.

4.

AS MINED AND SMELTED IN THE LARGE WAY, IT IS QUITE PROBABLE THAT ORE OF THIS CHARACTER, ESPECIALLY WHEN USED FOR FLUXING, CAN BE FOUND PROFITABLE WITH VALUES AS LOW AS 1 1/2% COPPER, AND IT IS BELIEVED BY THE WRITER THAT MUCH OF THE LARGE MASS OF CROPPINGS, ESPECIALLY ON THE WESTWARD EXTREMITIES OF THE VEINS OF THE GOULD PROPERTY, WILL BE FOUND TO SHOW THAT PERCENTAGE, AND THAT IMMEDIATELY BELOW SUCH CROPPINGS A GOOD COMMERCIAL GRADE ORE WILL BE FOUND; IN FACT, IN THE THREE VISITS THAT I HAVE MADE TO THE PROPERTY, I HAVE FOUND CONSIDERABLE VERY HIGH GRADE ORE AS A FLOAT FROM AN ORE BODY EVIDENTLY COVERED, LYING ABOVE THE HIGHEST VEINS AND JUST NORTH OF THE HUGE OUTCROP AS SHOWN ON THE MAP ON THE INVINCIBLE AND EXPERANZO CLAIMS, AND PROBABLY AT OR NEAR THE GRANITE-PORPHYRY CONTACT.

ECONOMIC CONSIDERATIONS

THE CONDITIONS ATTENDANT UPON OPERATIONS ARE IN EVERY WAY FAVORABLE FOR CHEAP MINING AND REDUCTION. THE TOPOGRAPHY IS SUCH THAT THE ORE CAN BE DELIVERED BY TRAMWAY AT THE SMELTER SITE AT THE FOOT OF THE MOUNTAIN, LATER TO BE SUCCEEDED BY TUNNELS. THE MINE FURNISHES AN ABUNDANCE OF WATER FOR THE PROPOSED SMELTER, IN FACT, WILL YIELD CONSIDERABLE WATER AND THEREAFTER CAN BE UTILIZED TO IRRIGATE THE FERTILE VALLEY ADJACENT.

AN ELECTRIC POWER PLANT CAN BE ERECTED ON THE RAILWAY AND OPERATED VERY CHEAPLY USING FUEL OIL AND THE POWER GENERATED CONVEYED TO BOTH SMELTER AND MINE. THERE IS A GOOD WAGON ROAD FROM THE RAILWAY AT TUCSON TO THE MINE, NOW 18 MILES, WHICH CAN BE SHORTENED, OVER WHICH MACHINERY CAN BE HAULED AT NOMINAL COST. THE SMELTER SITE IS A GENTLE SLOPING TRACT, ADMIRABLY SUITED FOR THE PURPOSE, BEING INTERSECTED BY A DEEP GULCH WHICH FURNISHES EXCELLENT DUMPING GROUND FOR SLAG FOR YEARS TO COME.

THE GENERAL PLAN OF DEVELOPMENT AND OPERATIONS ADMITS OF A VERY CHEAP COST OF HANDLING THE ORE FROM THE MINE TO THE FINISHED PRODUCT, THE ESTIMATED AVAILABLE COMMERCIAL ORE AGGREGATES A TOTAL OF ABOUT 100,000 TONS, AND A SUPPLY OF 1000 TONS OR MORE PER DAY IS WELL WITHIN THE RANGE OF EARLY ATTAINMENT. A TUNNEL DRIVEN FROM THE SMELTER SITE WOULD CUT THE FIRST VEIN OF THE SERIES AT ABOUT 400 FOOT LEVEL, AND THE SECOND AT ABOUT 700 FOOT LEVEL AND THE THIRD AT ABOUT 1000 FOOT LEVEL, THUS IT MAY BE SEEN WHAT EXTENSIVE DEVELOPMENT MAY BE PROSECUTED WITHOUT REQUIRING ANY ORE WHATEVER TO BE HOISTED.

ANY SELF FLUXING ORE ENABLES ECONOMIES WHICH GREATLY CHEAPEN THE COST OF TREATMENT, BUT WHEN THESE QUALITIES ARE SUCH THAT THEY ARE ALSO ENABLED TO TREAT A LARGE PROPORTION OF SILICIOUS ORES WITH A HIGH TREATMENT CHARGE FOR SAME, THE FLUXING QUALITIES ASSUME AN APPROXIMATE VALUE IN THESE ORES EQUAL TO THE TOTAL COPPER, SILVER AND GOLD CONTENT, HENCE THE BLISTER COPPER FROM THIS PROPERTY AND PROPOSED SMELTING PLANT SHOULD BE MARKETED AS LOW AS THAT OF ANY PLANT IN ARIZONA - IN FACT, IT MAY BE STATED THAT THE PROBLEM BEFORE THE GOULD COPPER MINING COMPANY IS NOT ORE DEVELOPMENT ENTIRELY BUT LARGELY ONE OF OPERATING, BEING CONFINED TO A STUDY OF THE NECESSARY EQUIPMENT AND BEST METHOD OF HANDLING.

OWING TO THE EXTENSIVE NATURE OF THE ORE BODIES AND THE LARGE TONNAGE WHICH CAN BE PRODUCED, I AM OF THE UNQUALIFIED OPINION THAT THE PROPERTY OF THE GOULD COPPER MINING COMPANY SHOULD RANK WELL WITH THE LARGE PRODUCERS WHEN ONCE UNDER FULL OPERATION.

RESPECTFULLY SUBMITTED,

(SIGNED) W. W. WISHON.

LOS ANGELES, CALIF.
JULY 6, 1908.