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E. N. PENNEBAKER
CONSULTANT GEOLOGIST
P. O. BOX 817
SCOTTSDALE, ARIZONA

Office: 23 East First Street

March 26, 1969

Mr. Conrad S. Preston
Vice President
Eason Oil Company
P. O. Box 18755
Oklahoma City, Oklahoma 73118

Dear Mr. Preton:

C
O
P
Y

The following is a brief account of my inspection of the mining claims being offered by Jim Sharp and associates. You are familiar with the claim group, and I need not describe it further than to say that the ground lies west and southwest of the great open pit copper mine operated by Phelps Dodge Corporation at Ajo, Arizona, and at one point it actually touches the pit perimeter (at the point marked "X" on the two sketches, I and II, at the back of this letter).

I was accompanied by Jim Sharp on a one-day reconnaissance of the area. I have visited the ground immediately south of the open pit several times, but this was my first inspection of the western area.

Briefly described, the so-called New Cornelia ore body occurs in a ridge or knob protruding from the Cornelia quartz monzonite. This rock intrudes an older group known as the Concentrator volcanics. Both of these rocks are covered on the

Mr. Conrad S. Preston - 2 - March 26, 1969

south by a great series of post-mineral gravel beds inter-layered with young volcanics. These gravel beds are known as the Locomotive conglomerate. All of the above formations have been tilted about 50 degrees to the south, and the ore body plunges down to the south at about the same inclination.

There is some ore in the flanking (Concentrator volcanics on the south), but in other areas the copper content diminishes in this formation.

Many features closely associated with copper mineralization trend NW and away from our area of present interest (such as introduced orthoclase, introduced quartz, vein magnetite and pegmatite). On the other hand, a zone of specularite runs NE-SW and into the Sharp ground. Gilluly of the U.S.G.S. writes that "specularite seems to be independent of the copper mineralization, though it probably marks a zone in the roof of the monzonite." Thus it may be very significant, because in the mine area monzonite is host to much ore.

The Sharp property may be divided into two parts. The eastern and more promising part extends from the Gibson Arroyo fault on the west to the pit perimeter at point "X". This is an east-west distance of about one mile across the more favorable northern part of the Sharp claims. All of the ground north of the line A-B on the sketch shows Concentrator volcanics at the surface. Specularite impregnation is strong in the southerly

Mr. Conrad S. Preston - 3 - March 26, 1969

exposures of these volcanics, which also appear to be bleached in places. Oxidized copper minerals are displayed here and there, although it is uncertain whether they were derived from indigeneous sulphides or from surface waters draining down from the pit area. It is possible that the specularite reflects a zone of monzonite porphyry at depth that might carry copper. Only deep drilling can answer this question.

West of the Gibson Arroyo fault bedrock consists of Cardigan gneiss overlapped by Locomotive fanglomerate on the south. The gneiss is generally considered a poor host for copper mineralization in this district, but a hole drilled on the Iron Wood claim to some 300 feet in depth, marked "Y" on Sketch II, shows minor sulphides (pyrite and chalcopyrite) in the drill cuttings presently scattered around the collar of this hole. Where scraped clean of surface debris, the Cardigan gneiss commonly displays scattered showings of oxidized copper minerals, but here, also, the source of the parent sulphides is questionable.

The ground east of the Gibson Arroyo fault is attractive because of a corner of the Sharp property touching the pit perimeter at "X" and the strong showing of specularite leading off to the southwest. West of the fault, possibilities within the Cardigan gneiss are dubious, except for the copper sulphide appearing in the drill hole at locality "Y". Beyond the line V-W on Sketch II, the ground appears worthless.

In my opinion, a legitimate but very speculative project is offered by the better Sharp claims. As a preliminary, this would require detailed geologic mapping and study followed or accompanied by geophysics (ground magnetic and I.P. surveys), next followed by probably drilling four deep holes.

There is a chance to find a big mine here, but we must be aware of the following disadvantages:

1. The project, properly carried out, will be expensive. Cost of the preliminary stage would be in the order of \$200,000.
2. Going out from the open pit, at point "X", copper mineralization might fade out into the volcanics.
3. Any ore found would probably be low in grade and deep, requiring underground mining, heavy capital costs, and very likely quite a number of years for return of capital. Perhaps it might be sold to Phelps Dodge, but that company would drive a hard bargain. (The quick sale by Quintana of its Kalamazoo ore body to Magma Copper might be difficult to emulate).
4. An adequate supply of water for an independent industrial operation might be difficult to find. Phelps Dodge has gone to considerable expense to develop its underground "water mine".
5. The mining of any ore found close to the property line, near point "X", might be tied up by injunction because its

Mr. Conrad S. Preston - 5 - March 26, 1969

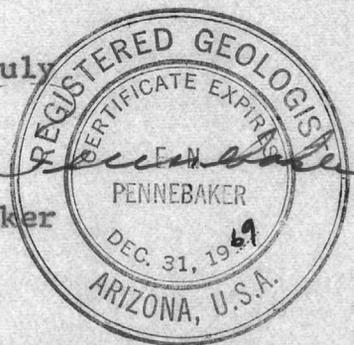
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If Eason Oil Company can take on these disadvantages,
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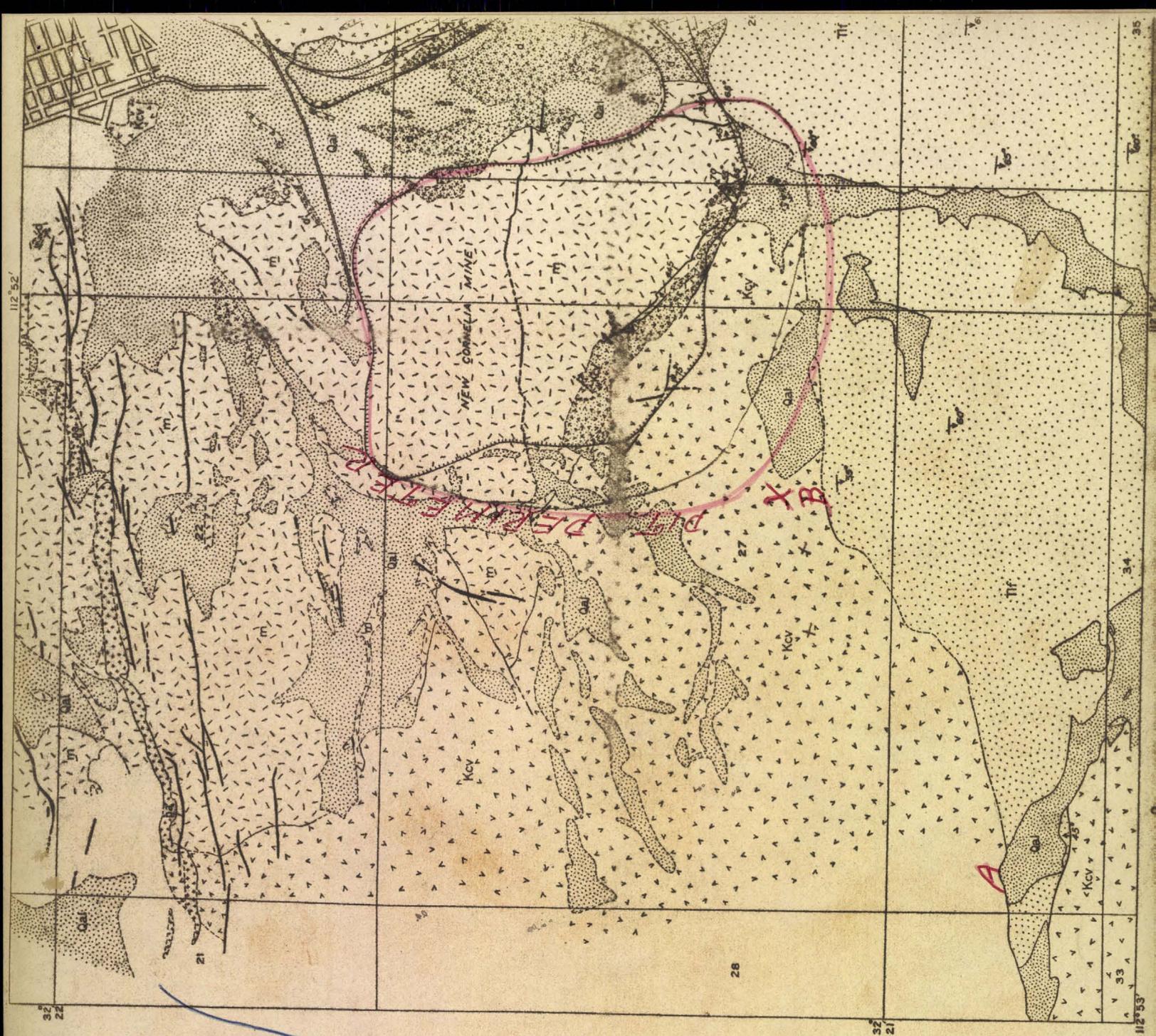
Yours very truly



E. N. Pennebaker



ENP:mc



GIBSON AERYO FAULT
CARDIGAN GNEISS

SKETCH
I

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SECTION 21

SECTION 22

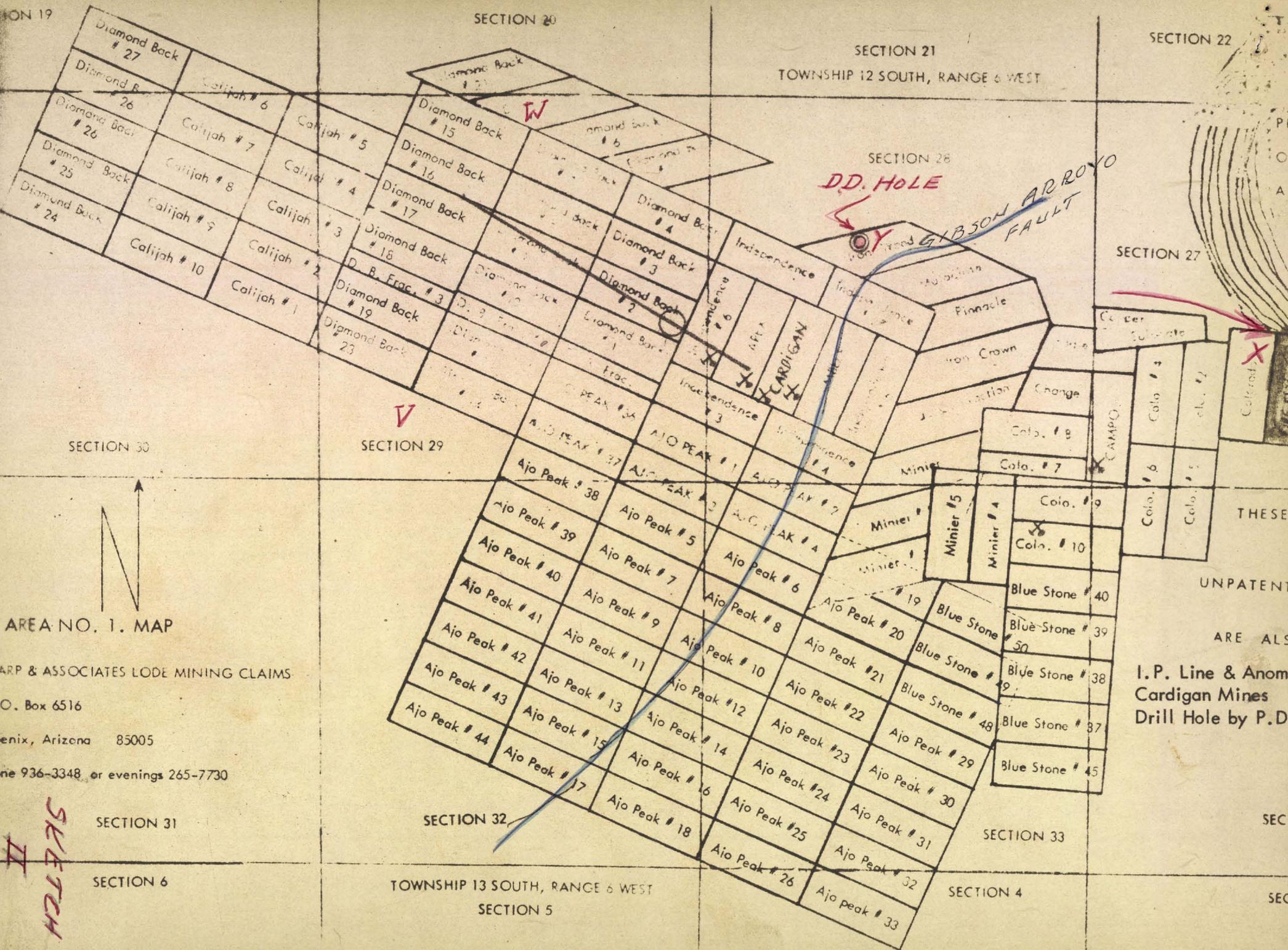
TOWNSHIP 12 SOUTH, RANGE 6 WEST

SECTION 28

DD. HOLE

GIBSON ARROYO FAULT

SECTION 27



SECTION 30

SECTION 29



AREA NO. 1. MAP

ARP & ASSOCIATES LODGE MINING CLAIMS

O. Box 6516

Phoenix, Arizona 85005

Phone 936-3348, or evenings 265-7730

SECTION 31

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SECTION 33

SECTION 6

TOWNSHIP 13 SOUTH, RANGE 6 WEST

SECTION 4

SECTION 5

II
SKETCH

I. P. Line & Anom
Cardigan Mines
Drill Hole by P.D.

UNPATENT

ARE ALS

SECT

SEC

March 26, 1969

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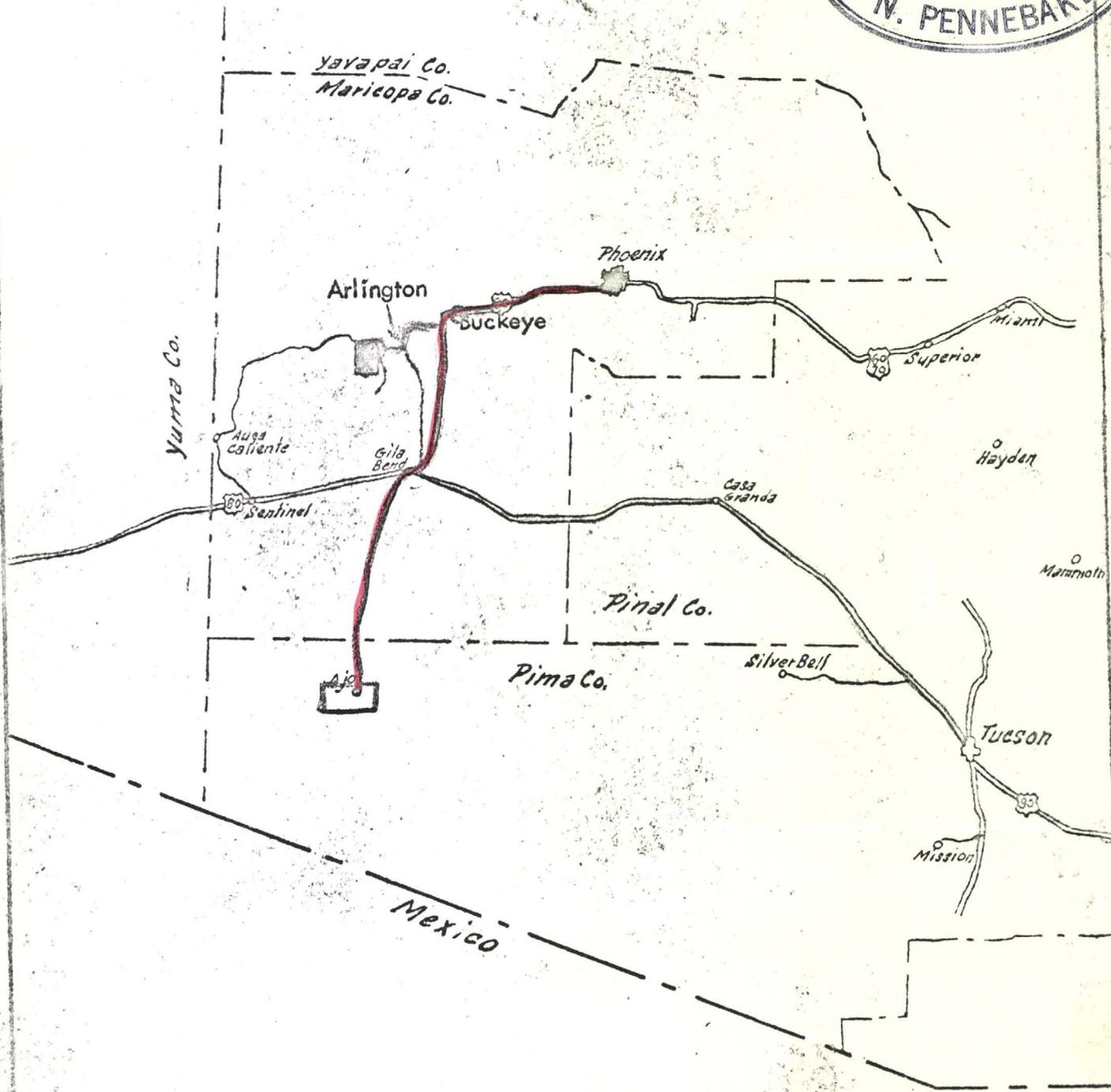
Yours very truly

E. N. Pennebaker

ENP:mc

Bagdad

Jerome



4 miles past Buckeye turn right on road to Palo Verde and Arlington continue on this road to Arlington Cattle Company, turn right under the Arch and continue one mile, turn right on the Dirt Road toward Agua Caliente and Hyder continue about 14 miles to rail road, the property begins about 2 3/4 miles past the rail road and is located about 1 mile north of the road and about 5 miles south of the road. The property is about 3 miles in width.

INDEX MAP
SOUTHWEST ARIZONA
SCALE: 1" = 27.5 MILES

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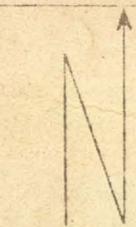
TOWNSHIP 12 SOUTH, RANGE 6 WEST

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SECTION 29



AREA NO. 1. MAP

SHARP & ASSOCIATES LODE MINING CLAIMS

P. O. Box 6516

Phoenix, Arizona 85005

Phone 936-3348 or evenings 265-7730

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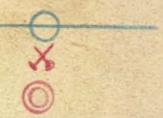
1600
PHELPS DODGE
OPEN PIT MINE
AJO, ARIZONA
11/53

THESE PATENTED AND

UNPATENTED CLAIMS

ARE ALSO AVAILABLE

I. P. Line & Anomaly
Cardigan Mines
Drill Hole by P.D.



AJO MINE



AJO MINING DIST.
 SECOND CLASS
 MAIL PERMIT NO. 100
 TUCSON, ARIZONA
 POST OFFICE BOX 100
 TUCSON, ARIZONA

RECEIVED
 MAR 17 1959
 T. M. PENNENBAKER

JOSIE # 55	JOSIE # 56	JOSIE # 57	JOSIE # 58	JOSIE # 59	JOSIE # 60	JOSIE # 61	JOSIE # 62	JOSIE # 63	JOSIE # 64	JOSIE # 65	JOSIE # 66	JOSIE # 67	JOSIE # 68	JOSIE # 69	JOSIE # 70	JOSIE # 71	JOSIE # 72	JOSIE # 73	JOSIE # 74	JOSIE # 75	JOSIE # 76	JOSIE # 77	JOSIE # 78	JOSIE # 79	JOSIE # 80	JOSIE # 81	JOSIE # 82	JOSIE # 83	JOSIE # 84	JOSIE # 85	JOSIE # 86	JOSIE # 87	JOSIE # 88	JOSIE # 89	JOSIE # 90	JOSIE # 91	JOSIE # 92	JOSIE # 93	JOSIE # 94	JOSIE # 95	JOSIE # 96	JOSIE # 97	JOSIE # 98	JOSIE # 99	JOSIE # 100
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PRACTICAL DEDUCTIONS

From the foregoing discussion the following facts respecting the New Cornelia ore body appear to be established :

1. The ore body is in a ridge on the magma chamber of the Cornelia quartz monzonite.
2. The entire block of Cornelia quartz monzonite has been tilted fully 50 degrees southward since its emplacement and mineralization; therefore the southern border of the stock now marks its roof at the time of its emplacement.
3. The ore body is localized by fracturing in the Cornelia quartz monzonite and its associated wall rocks, not by their chemical composition nor by their relation to present or former erosion surfaces. However, the fracturing seems to have been chiefly operative in the monzonite rather than in the wall rocks.
4. Reconstructive processes connected with the mineralization have been so extensive that the joints and faults at present visible have no discernible relation to the shape of the ore body; their study therefore gives no help in search for extensions of it or for other independent bodies.
5. Except for a steady diminution of bornite with depth, no mineralogic changes of any economic importance appear likely to be encountered as the mine is deepened.
6. There is a highly alunitized area just east of the mine.
7. There is a small but rather persistent amount of molybdenite in the ore.
8. The specularite seems to be independent of the copper mineralization, though it probably marks a zone in the roof of the monzonite.

The conclusions that seem to follow from these facts are as follows: Minor structural features now visible offer little hope of guiding prospecting. There is little possibility of discovering additional ore deposits west of the Gibson Arroyo fault because the roof of the monzonite there has no cupolas that might guide the ore solutions. Similarly there is little prospect of finding ore bodies on the north side of the Little Ajo Mountains, as the rocks there exposed were deep in the magma chamber at the time of intrusion and mineralization.

The areas north of the Little Ajo Mountain fault and any considerable distance south of the overlap of fanglomerate on the south side of the mountains offer little hope, as there is nothing to guide the search, and rock of pre-Loomotive age probably is at prohibitive depth in both areas. These considerations lead to the following conclusions as to the most likely places to search for additional ore bodies:

1. In the area of Concentrator volcanics between Cardigan and Arkansas Mountain the hematite impregnation is so heavy as to suggest an underlying magnetic source. Although there is a poor correlation between the distribution of hematite and that of the copper minerals, yet where the impregnation with specularite is so unusually heavy there is strong evidence of an underlying body of magma that emitted mineralizing emanations, and therefore there is a good possibility of finding copper at originally lower horizons. Owing to the postmineral tilting of the Little Ajo Mountains, the north side of this zone of specularite mineralization would appear to offer

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mis-spelling) Ariz. Bur. of Mines. Bull. 141 (1937)
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the best places to drill, for rocks that lay at deeper levels at the time of the mineralization are here exposed, and if copper minerals underlie the hematite they should be reached at shallower depths along the north side of the belt than along the south side.

2. In the area between the eastern waste dump and the approach to the New Cornelia pit and for a considerable distance to the south, the specularite is also abundant, dikes of monzonite suggest an underlying cupola, and the volcanics in the approach seem well mineralized. A few drill holes in this area might be worth their cost.

3. Deeper drilling than has yet been done at the north end of the New Cornelia pit might disclose an extension of the ore body in depth. The low-grade material encountered by the generally shallow holes in this part of the pit may be simply a horse of waste like that encountered farther south at deeper levels in the mine.

4. The alunitic area east of the New Cornelia compressor house seems worth investigation. Alunite is associated with gold deposits in many parts of the world, and although gold is not abundant in the copper deposit at Ajo it might be present in economic concentration in the alunite-rich volcanic rocks.

None of these possibilities appear so bright as to warrant a large-scale campaign of exploration, yet they appear worthy of consideration when the day comes for further prospecting at Ajo. Of the unexplored territory they seem clearly the most promising portions.

The molybdenite content of the ore as mined is difficult to estimate otherwise than a mill test, for the molybdenite appears to be irregularly though widely distributed. It would seem worth while to consider the possibility of recovering this mineral in the flotation process to which all the ore is subjected, for it could be cheaply recovered, even though present in small concentration, it might make a by-product of considerable aggregate value.

BY:
JAMES GILLULY, Geologist
U. S. Geological Survey
January 1, 1937

Cardigan Property Is Sold

BUYERS ARE MINING MEN OF SUCCESS AND INFLUENCE

Purchase Price Runs into Six Figures, and a Cash Payment Is Made; Men Connected with the

DARBY GROUP, ALSO

New York Firm of Hayden, Stone & Company Are Interested

COMPANY ORGANIZED

A mining deal of great importance to the district was consummated the first of the week, when Josiah Winchester and Associates took over the Cardigan group of nine claims from Thos. Childs and others.

The Darby group, consists of six claims, was also taken over, and the two properties are to be combined and operated as one group, by strong financial interests without delay.

We say "great importance", not because of the price involved though it is large and includes a cash payment, but because of

Buyers Influential

1st.— The prominence, experience, and influence of the buyers. J. S. Suits, one of the number, sold a one-fifth interest in the Luckey Tiger in Sonora, Mexico, for \$100,000. This is one of the leading gold properties of the country. He is a successful mining man of experience and influence, carrying weight wherever he goes. Josiah Winchester, the promoter, is a recent arrival from Prescott. He went to Colorado in 1878 and made a fortune in the famous Doctor mine at Cripple Creek. Others of the buyers are connected with one of the leading brokerage and banking concerns of the country, whose OK. on any property, is sufficient to put it on a sound financial basis.

Cardigan Rich Shipper

2nd.— Because of the value and importance of the property. As a shipper of rich Copper Ore, the Cardigan has of late attracted the attention of the whole country and has all at once by producing \$48.00 Ore and \$1,000 carloads shown to the world that not only is this a camp of low grade Copper Ore, but one having every indication thus early of being principally a camp of high grade Copper Ore carrying excellent Silver Values.

Here we will insert a statement from Mr. Winchester, promoter of the deal it was made in response to a request from the Newsman for particulars with reference to the deal. The statement follows:

Statement of Buyer

I induced some mining friends of mine to join Mr. Frederickson, who had a lease upon the Cardigan group of mining claims, in the purchase of the property from Thos. Childs and Associates. These same gentlemen also purchased the Darby group of six claims adjoining the Ajo Consolidated Copper Company's ground on the south, thus making fifteen claims, all of which will be incorporated in a company of 1,000,000 shares of \$1.00 each.

I don't know how the directing owners intend working the property, but some of them will be on the ground within the next fifteen or twenty days to confer with Mr. Frederickson and the superintendent, Mr. John Jones, who has had charge of the Frederickson lease from its inception and is perhaps better acquainted with the ground and its Ore Shoots than is any other living man.

The Company will very likely offer none of its stock for sale to the public except as they may list it later upon one of the Eastern exchanges. Mr. Frederickson will no doubt be given a limited amount to dispose of at cost amongst his neighbors in Ajo.

I am not at liberty to say what the purchase price was, but it was well up in the six figures.

Messrs. Skinner and MacKelvie of Hayden, Stone & Co., New York, and J. E. Suits of Yuma are amongst the purchasers of this property.

Ore \$48.00; no Sorting

The Cardigan is situated two and one-half miles southwest of Ajo. To best and most quickly describe it, we will tell of its production. During the past three months eight cars have been shipped. We have before us returns from the last three shipped to the Old Dominion Smelter.

Car No. 1 net \$1,033.47
Car No. 2 net \$1,034.16
Car No. 3 net 987.17
The three cars averaged, per car \$1,021.60.

In the case of No. 1 the assey value per ton was \$48.85.

In No. 2, value per ton, \$54.10.
In No. 3, value per ton, \$41.96.
Average assey value per ton for the three cars, \$48.10.

It should be borne in mind that all shipments were made without sorting, the low grade with the higher. By sorting much better returns could be obtained.

\$48 Ore without sorting is "Some Ore".

It should also be noticed that the proposition is greatly enhanced by the Silver Values, the average for the three cars being 16.86 oz. to the ton.

Find Ore on the Surface

Attention is also called to the fact that there is no overburden to speak of hence shipments have been made without development. The Ore is right on top of the ground and all one has to do is mine it. Four men took down a car of Ore in five days recently. With the exception of the main shaft, no opening is over 30 ft. in depth, and the Ore for eight cars was taken from only a few of these. A visitor could scarcely believe it, but the smelter returns show for themselves.

Copper values are from 4 to 40 per cent, and silver from 6 to 56 oz. And since Silver is quoted at 73 1/2¢ per oz. and Copper above 30¢, it will readily be seen what a proposition the Cardigan will prove to be, if, as expected, large bodies of Ore of this class should be encountered at depth. The main east west dyke, which seems to be practically all Ore, is apparently about 300 feet in width. with rich strata or pay streaks 5 to 8 ft. wide. This is intersected by north south dyke not quite so wide. In every opening Ore continued with depth. Hence the outlook for a depth, say, of 200 ft. is not excelled, it is believed, in the southwest. The deepest shaft, 85 ft. is bottomed in rich Ore. But the Cardigan not only has a future, it has a present — it is today a shipper.

Many Fine Showings

The Ore showings in shallow shafts and open cuts on this property are too numerous to mention, and the surface

indications and croppings are unexcelled. There are many gossans or "iron caps" and one here is among the largest and most prominent in the district. Break open a rock from any of these outcrops and you will be surprised (if unacquainted with the camp) to see that it is Ore. Ore is here, there and everywhere. And, as stated, the fact that there are cross dykes spells, it is believed, strength. Where the strongest cross lead intersects the main east-west dyke in the vicinity of the shaft, there is a magnificent showing that augers fine for depth.

Rich Ore Shipped Years Ago

Rich Ore was shipped from the Cardigan several years ago, before the advent of the C. & A. and as nothing was left on the dump it was clear it was all shipping Ore. There was no railroad here then, either, so it must have been high grade Ore to pay — and it paid. But the operators, it seems, were in error when they thought they had mined all the rich Ore there was.

New Cornelia Close by

The Cardigan is surrounded by promising groups and is only about 2,000 ft. from the New Cornelia, as is quite generally known has developed about 45,000,000 tons of Ore, including some of high grade and has just installed a 5,000 ton leaching plant for the carbonate Ores, besides shipping from two to three cars of sulphide Ores daily to the C. & A. Smelter at Douglas. Eight or ten years on this carbonate Ore will be followed by the mining of the sulphide Ores that lie underneath.

The Darby Looks Fine

The Darby Group, though not possessing a shipping history, is by no means out of place to go along with the Cardigan into an active producing company.

We visited this property this week and believe that if surface showings and indications and situation count for anything, the Darby will be heard from very favorably in due time. It is only a short distance southeast of town it adjoins the Ajo Consolidated on the

south. The Ajo Consolidated has developed to date about 25,000,000 tons of Copper Ore running a trifle higher than the New Cornelia Ore, and the tonnage is being added to by diamond drilling at the rate of about 1,000,000 tons a month. Two drills being in operation. The Ajo Consolidated is shipping under contract to the Copper Queen Smelter at Douglas Ore running from 4 to 6 per cent. off the dumps and can continue so shipping indefinitely. The President of the Ajo Consolidated, James Phillips jr., was formerly president of the Tennessee Copper Co. Adjacent to the the Darby on the east is the Ajo Cornelia, in strong Miami mining men's hands and now being developed by diamond drilling. Lying next on the west is the Cornelia Ajo, formerly known as the Cornelia Extension. This property has passed into the hands of financially able New York, and Tucson people and active operations with diamond drilling to start on, are to be commenced soon. it is understood.

The dyke runs from east to west through this property from the Ajo-Cornelia, through the Cornelia-Ajo to the Cardigan. And so far as one can see there are practically the same formations and indications on the Darby as on the Ajo Consolidated. This dyke appears to be 250 or 300 ft in width with rich streaks of Ore running through it. Assays taken show values in Copper up to 22 1/2 per cent, with some silver. Samples taken across the dyke for a distance of 270 ft. averaged 3.2 per cent copper. As stated, the Darby is at present no more than a prospect, but it is an excellent prospect taken in connection with the surroundings, mining engineers have expressed the opinion that sulphide bodies should be encountered at about 200 ft. LATER, — A telegram received by, The News from Mr. Winchester dated at Phoenix Apr. 27, conveys the information that the Cardigan Copper Company was incorporated yesterday under the laws of Arizona for \$1,000,000 shares \$1 par, with a half million

shares set aside as treasury stock. J. E. Suits is president and treasurer, and R. E. Frederickson secretary. The principle place of business is given at Ajo.

MACDONALD AND SEXSMITH

CONSULTING MINING ENGINEERS

SUITE 310

4 RICHMOND STREET EAST

TORONTO, ONTARIO

J. R. MACDONALD, B.Sc., P.Eng.
TAYLOR 2-4315, CLARKSON

EMPIRE 6-8442

R. N. SEXSMITH, B.A.Sc., P.Eng.
1338-W. CHATHAM

10th Nov 58

C
O
P
Y

W.E. Burnside Esq.,
55 Broadway,
New York.

COPY FOR MR. KNOX

Dear Willis,

You are referred to your copy of a letter to me from Nesbit, dated Nov. 17/ 57. This letter shows the results of samples taken from the core of DIB 3 (NC800) prior to footage 1118; these values were omitted from the log of this hole, a copy of which was sent to you and to W. Knox. Please add this letter to your copy of the log and forward a copy to W. Knox, whose address I do not have.

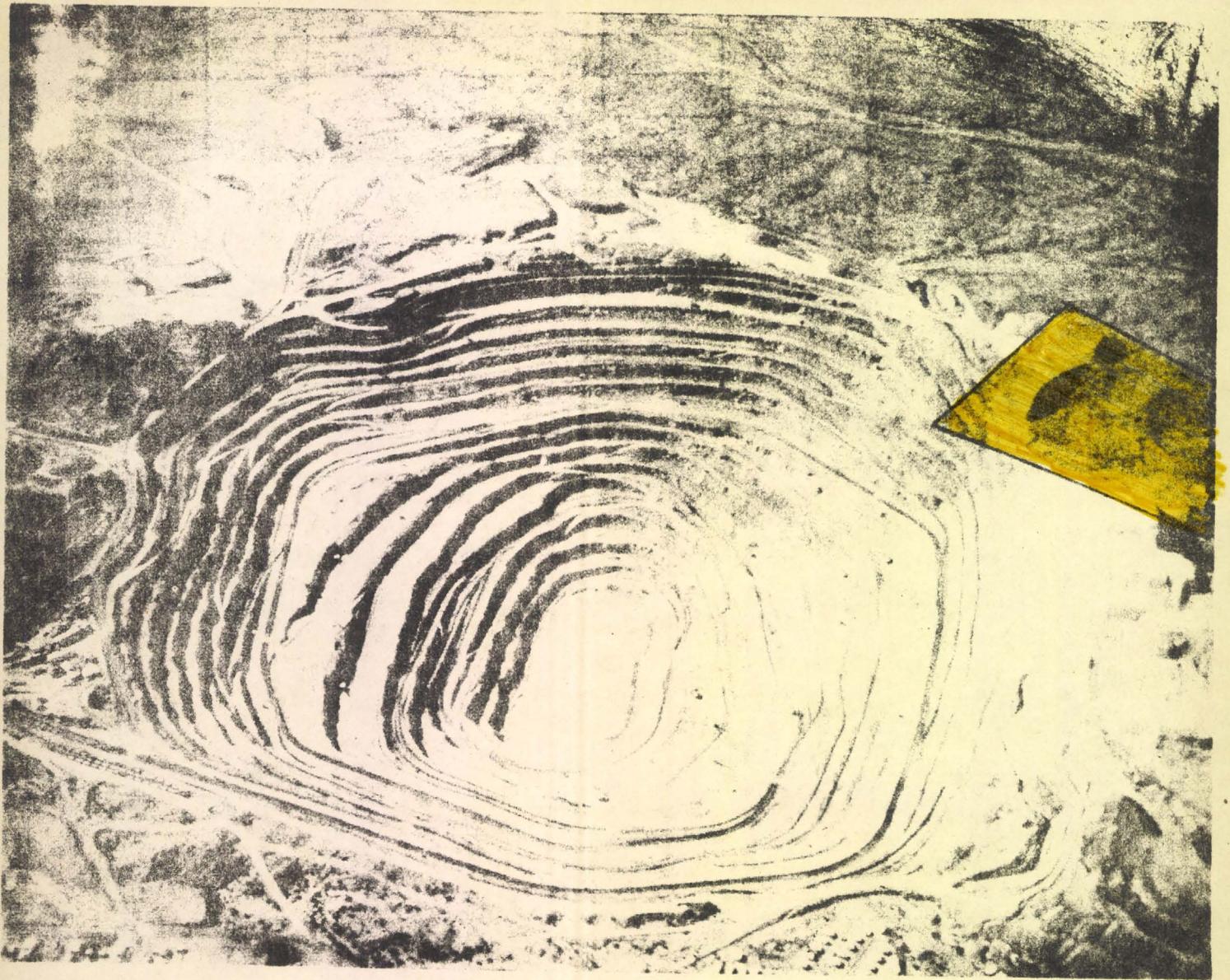
#43	1006-1016	.03% Cu	#49	1066-1076	1.12% Cu
44	1016-1026	.02	50	1076-1086	.89
45	1026-1036	.03	51	1086-1096	1.28
46	1036-1046	1.04	52	1096-1106	.56
47	1046-1056	.02	53	1106-1118	.89
48	1056-1066	1.03			

When the two samples following are included, namely # 1 & # 2, an average value of .84% Cu between footages 1006 and 1118 is shown, and was reported.

Kind Regards,

J.R. Macdonald.

1127
1118
1006
1121



The above is an aerial view of the approximately one mile wide (open pit) New Cornelia Mine, located at Ajo, Arizona, wholly owned by the Phelps Dodge Corporation.

The rectangular shaped property outlined (consisting of about 62 acres) is owned by the NEW CORNELIA EXTENSION COPPER CORP., a Delaware Corporation. The northeast corner of the property (approximately 7-1/3 acres) is about seven-hundred feet east of the pit, six benches or about 350 feet down within the pit itself.

An inspection of the ore occurrence within the New Cornelia Pit immediately adjacent to the Company's property line, together with a perusal of documents published by the U.S. Geological Survey, lead the Company to consider it probable that the ore visible in proximity to the property line of the Company extends under the Company's property.

A copy of an offering circular with respect to securities of NEW CORNELIA EXTENSION COPPER CORP., which are being underwritten by WILLIS E. BURNSIDE & CO., INC., is attached.

WILLIS E. BURNSIDE & CO.
INCORPORATED

SPECIALISTS IN
CANADIAN, AMERICAN AND FOREIGN SECURITIES

Whitcomb 3-0852

DIRECT WIRES
TO CANADA

AT&T TEL NY 1-3972

42 Broadway
New York 4, N.Y.

Harry Simmons Co.

Cable: Harsimmons, New York

Teletype: NY1-4581-2

40 EXCHANGE PLACE NEW YORK 5, N. Y.

Wills E. Burnside & Co. is in no way connected with the ~~Teletype of Wills E. Burnside & Co.~~ -6627
on New Cornelia Ext. Copper Corp.

MARKET NEWS LETTER

Reprint of Report By Richard Bruce & Co., Inc. New York 18, N. Y. August 2, 1957

DAVID AND THE COPPER GOLIATH

INTRODUCTION: When copper prices reached stratospheric heights, underwritings of copper company stocks came rushing along faster than the Mississippi River during flood season. When the inevitable sharp decline in prices came, it was matched only by investor apathy towards copper stocks in general.

In the midst of this general disinterest, a new copper stock underwriting should have had suicidal chances for success. Yet, the stock reviewed in this report has enjoyed a spectacular, albeit short history. Underwritten in June 1957, it was oversubscribed then and has enjoyed a continual rising market since. If you know mining, the name of the stock will give you the reason; if not, you will have to read the report.

NEW CORNELIA EXTENSION COPPER CORP.

LONG TERM DEBT : \$1,075,000.
COMMON STOCK : 630,000 shares
APPROXIMATE PRICE : \$2.25 per share

HISTORY: In the little Arizona city of Ajo, they have a monument to Hoval A. Smith. It is not a statue reaching for the sky, but a hole, a mile and over 600 feet deep. Each day 80,000 tons of rock and copper ore are removed from the open pit, sped over 38 miles of railroad within the pit itself, to a \$300,000,000.00 mill and smelter.

IT IS THE FOURTH LARGEST COPPER MINE IN THE WORLD.

Back in 1911, when the high grade, low cost mine was placed in operation, only Smith seemed to realize the "bonanza" at hand. While the New Cornelia Copper Corp. was a separate company, in actuality, it was controlled by the Calumet & Arizona Copper Corp., for whom Smith was the chief engineer.

Before the original mine began operations, Smith, had painstakingly staked out all the land to the south. The company Board of Directors, in a "penny wise - pound foolish" move decided the small additional cost was unnecessary and, over Smith's violent objection, allowed the options to expire.

Just about this time, a claims dispute over one of the company's other holdings flared to life. Smith was dispatched to Washington where he would remain for the next two years defending the claims, and Ira Joralemon was placed in charge of the New Cornelia Mine.

In 1912, the company again had a chance to correct their past mistake. The 180 acres of land to the south of the mine was offered to Joralemon for \$125,000. If Joralemon thought he could outwait the owners and purchase the land cheaper, or if he truly believed it to be of no value, we will never know. Fate took the play out of his hands. For when he refused the offer, James Gaskill, an "eastern dude", took an option on the property.

Since Gaskill had no visible financial resources, Joralemon was unconcerned. Young Gaskill had an "ace in the hole". He raced east and convinced his uncle, a Mr. Phillips, to buy the property.

Joralemon, now worried, had Phillips' finances investigated. The report gave this discouraging truth -- PHILLIPS WAS WEALTHY ENOUGH TO COMPLETE WHAT HE UNDERTOOK

Joralemon went to Phillips and told him that he had made a bad buy, and only because New Cornelia could use the land to pile overburden removed from the pit was he saved. Joralemon offered to relieve Phillips of his mistake by assuming the purchase contract.

Phillips refused and began to drill Joralemon in a state of panic offered \$500,000.00 for the land Phillips kept drilling.

A higher offer brought the same results, and so in 1917, Phillips was given \$500,000 and 200,000 shares of New Cornelia common, selling on the N. Y. Stock Exchange at \$30 per share, for his 180 acres. A TOTAL OF \$6,500,000.00.

At Phillips death, Newmont Mining bought the New Cornelia stock from his estate, and in 1929 New Cornelia was merged with the Calumet & Arizona Copper Corp. Phelps Dodge, who had exhausted their ore bodies, negotiated with the holders of the Phillips' stock in 1930. Following the negotiations, Calumet & Arizona Corp. was sold to Phelps Dodge.

The New Cornelia mine has since become the foundation of Phelps Dodge, the country's second largest copper company. It is said to contribute 25% of Phelps' earnings. But the story doesn't end here.

In 1934, a geologist, named Dr. Jas. Gillully, did a government survey on the Ajo mining district of Arizona. He felt that the southern limit of the ore from New Cornelia would be on the old Phillips land. Hoval Smith disagreed, believing that a fault in the earth south of the Phillips land caused the ore body to plunge deeper below the surface. He urged purchasing the land and was again rejected.

This time, Smith bought the property known as the Firefly Group for his own company, the Little Ajo Mining Corp. He felt there would be 50,000,000 or more tons of ore below the surface. The strategic value alone, of the 62 acres, made it a good purchase. An open pit mine must be widened a foot for every foot it is deepened. Smith reasoned that Phelps would reach the end of their property, discover more ore and thus be forced to acquire his land in order to keep operating.

In 1951, his land was reached and his theories apparently vindicated. The ore seemingly extended on, and Phelps, in order to widen their pit, leased 7 1/3 acres of the Firefly claims for \$220,000. In addition, all ore mined was to be stockpiled unless, by mutual agreement, Phelps refined the ore. In that case, profits would be split 50/50.

Shortly after Smith's death, Richard H. Nesbit bought a 75% interest in the Firefly claims from the Little Ajo Mining Corp. With this interest, he formed the New Cornelia Extension Copper Corp. and the stock was offered publicly in June of this year at \$1.00 per share. The money raised was to be used for drilling and to acquire, if possible, some income producing oil lands.

At the present time, all the land leased to Phelps extends some 350 feet into the pit itself. In order to continue mining in that area, Phelps seemingly must take more of the company's land. The town of Ajo, Arizona, is on one side of the pit. The mill and smelter stand on a second side, and the ore stockpile and overburden lies on the third side. Thus, it appears logical to assume Phelps' found Smith to be correct once again about which direction the ore body ran.

New Cornelia Extension began diamond drilling on their property in June, and early results have been excellent with ore encountered at a higher level than first anticipated. American Metals, owners of land adjoining the New Cornelia Extension property, have begun diamond drilling with excellent results, unofficially reported.

PROS, CONS AND CONCLUSIONS: That copper ore is to be found on New Cornelia Ext.'s property seems assured. The direction of the ore running through the property can be seen with the naked eye. Open to question is the amount and grade. If Smith was correct, and he is batting 100% up to here, there is 50,000,000 or more tons of high grade copper ore on the property. Such a tonnage would, translated into dollars, mean \$100 worth of copper for each share of New Cornelia Ext. now outstanding. This, at the present depressed price of copper ore on the world market. Against the world price of 28¢ per pound, the cost of New Cornelia copper is 15¢ per pound.

If Smith was wrong, the land still is seemingly needed by Phelps Dodge to continue their own operation. At the last price Phelps' paid to lease the 7 1/2 acres, the landlease value of the remaining acreage would translate into \$1.70 per share of stock.

Why, you might ask, did not the "Goliath" Phelps Dodge acquire the "little David" piece of property now seemingly plaguing it? Why wait until the ore is visible to the naked eye? Why wait until the company has cash in the bank? There is no logical answer. No more than there was, when 180 acres could have been bought for \$125,000 only to end up costing \$6,500,000. If Smith was wrong, why was a \$300,000,000 smelter built in 1951? Certainly not to be abandoned ten years later. Why was that side of the pit left open? Why has Phelps' leveled the whole mountain adjoining the New Cornelia Ext. property?

The diamond drills, biting into the earth will give their own answer shortly. The stock is a speculation, NO STANDARD OIL BY ANY MEANS, but the best speculation we have seen in the last few years. For those inclined to risk a little for a potentially big "pay-off", this is probably as good as you can find. A purchase of this stock is putting your money on Hoval Smith's judgement, and after all, they dug a billion dollar monument to him in Ajo, Arizona. Jerome Kass 7/31/57

Willis E. Burnside & Co.
INCORPORATED

SPECIALISTS IN
CANADIAN, AMERICAN AND FOREIGN SECURITIES

Whitcomb 3-0852

*42 Broadway
New York 4, N. Y.*

July 15, 1957

TO: Mining Engineers, Investment Advisors,
Metal Statisticians and to Our Clients

Gentlemen:

This informal letter (with its enclosures) is worthy of your intense analysis.

Forgive us for reminding you that we called the sound Falconbridge Nickel Mines situation to your attention when it was dormant in the \$14.00 to \$20.00 level. This stock has recently sold above \$40.00 per share and, in our opinion, is still headed higher.

You, undoubtedly, know about Phelps-Dodge's New Cornelia open pit copper mining property, situated in Ajo, Arizona. About 80,000 tons of rock and ore are removed each operating day from this pit. This mine is a substantial contributor to Phelps-Dodge's annual dividend. The open pit is about 600 feet deep now. There are about 38 miles of railroad (140 pound rail) in the pit and the entire present day worth investment of Phelps-Dodge in this operation, including its railroads, must be well over two-hundred-and-fifty million dollars. As a basic point to be remembered, to provide benches for railroad tracks and operations, for each one foot the pit is deepened, at least one foot of lateral shelving should be provided.

Now, here is where some intense thinking should be done:

New Cornelia Extension Copper Corp., acquired 62 acres adjoining the pit (in fact the use of 7 1/3 acres of the 62 are leased to Phelps-Dodge and are a part of the pit.)

We believe that the orebody in the New Cornelia pit extends under the property of the New Cornelia Extension Copper Corp. The property is now being drilled to prove this contention which is supported by sound Canadian and American Engineers' opinions.

We recently completed our public offering of 300,000 shares of New Cornelia Extension Copper Corp., at \$1.00 per share and its stock is currently being traded at prices between \$1 1/4 to \$ 1 1/2 per share.

Our firm has been specialists in the Mining securities business for many years. We have never seen a speculative mining stock which has the capital gains potential which New Cornelia Extension Copper Corp., presents with its small capitalization.

We sincerely ask you to intensively study the attached recently used Offering Circular and allow us to act as your Broker (charging standard commission rates) in acquiring some of this stock for you and your family.

Looking forward to having you as one of our permanent clients, we are,

Sincerely yours,

WILLIS E. BURNSIDE & CO., INC.

ECONOMIC GEOLOGY

AND THE

BULLETIN OF THE SOCIETY OF ECONOMIC GEOLOGISTS

VOL. 63

MARCH-APRIL, 1968

No. 2

The Cornelia Pluton, Ajo, Arizona

July 30, 1955

Mr. John Payne, Jr., Vice President
The American Metal Company, Limited
61 Broadway
New York 6, New York

Dear John:

I have your letter of July 27 with regard to the Bluestone claim group located just south of the open pit at Ajo, Arizona.

When this matter came up in 1948 and 1949 I was working for Miami Copper Company, and John Hope handled much of this for Coppermines; however, I did make a brief visit to the area on May 23 and 24, 1949, just before I took off for my second trip to South Africa. I have reviewed my file on our discussions, and the following are my comments. At present I find myself somewhat more favorably impressed than I was six years ago.

As regards PD's failure to acquire this property and John Hope's role in the proceedings, I have no ready answer; however, Hope is with the Exploration Department, which, as I understand it, is entirely divorced from the operating units. The latter employ geologists as assistants in the various engineering departments to handle local geology. If the unit managers want other help, they request assistance from the Exploration Department, but I suspect this is rather seldom done. I further suspect that suggestions for property purchase close to operating units would originate with the local general manager rather than the Exploration Department at Douglas. Hope's work has been largely on outside scouting, and some of the top officials at Ajo didn't know him when I mentioned his name a year or two ago. Had he been actively promoting the acquisition of the Bluestone group, they would have known him well, I should think; maybe his ideas haven't reached the right place.

So the mystery still goes on as to why they haven't acquired property on the south. Maybe they think there are no ore extensions and have some supporting facts to prove this contention; maybe they are thinking in terms of open cut operations only and are afraid of the stripping ratio; or maybe they are persisting in a freeze-out policy set years ago and followed with Scotch Presbyterian stubbornness, thinking that the physical difficulties of starting an independent operation and the PD prestige will keep others out. I sort of incline to the last supposition.

In recent years, three things have impressed me that add some favorability to a project at Ajo:

One is the rather common occurrence of ore fringes and extensions in the rocks flanking porphyry copper deposits, particularly if lower grade ores can be handled. In 1933, Ajo had a reported reserve of 170 million tons. In the last 22 years they probably have mined out 140 million tons, so present reserves less 30 million represents additions due to discoveries and the lowering of the cut-off grade. At Ajo heads have dropped from 1.25% to about 0.8% since 1933. Similar fringes have been developed at Chino, Ray, and Ely, so it is common to find substantial extensions with vigorous explorations.

Second, recent advances in the price of copper may make it possible to profitably mine lower grade extensions.

Third, we are too prone to evaluate possible future discoveries at the same grade as present reserves. In other words copper recovery at Ajo is currently about 14 pounds per ton, and we are likely to consider that future discoveries will be of the same tenor. On the other hand, recent discoveries at Little River and Pima are better than neighboring occurrences, and perhaps we should take a more optimistic view, particularly when considering the primary mineralization at Ajo.

There are two significant structural trends in and near the Ajo pit. One runs about N40W and is reflected by:

- 1 - SW. contact of the Cornelia quartz monzonite against the volcanics.
- 2 - Trend of introduced orthoclase.
- 3 - Trend of introduced quartz.
- 4 - Trend of vein magnetite.
- 5 - Trend of main ore body.

The other runs NE and is shown by:

- 1 - Trend of specularite zone.
- 2 - Trend of a segment of the ore body on the south on 1600-foot to 800-foot elevations.

There is also an east-west dike trend of debatable significance.

The trend of the main ore body projected southeasterly leads to the Bluestone and Copper Ridge groups. To me this is the most promising trend because more features directly related to mineralization fall along it. The two Bluestone diamond drill holes are on the

southwest edge of this trend rather than along its axis. These holes gave favorable results in that (1) the bedrock was somewhat shallower than expected and (2) the volcanics cut beneath the fanglomerate were highly altered and carried some copper (apparently about an average of 0.24%). I would expect better mineralization farther to the east.

If, on the other hand, we correlate the southwesterly specularite trend with the ore segment on the south, then a promising trend would follow through the NW corner of the Bluestone group, the ABC ground, the Malone claims, and the Cardigan group. I am not as favorably impressed with this possibility as I am with the southeasterly projection mentioned above, but it needs to be carefully considered. In this case additional drilling should be west of the Bluestone holes.

The unfavorable features accompanying possible extensions of the Ajo ore body have been discussed before and are:

- 1 - Ore body extensions would probably be covered by thick capping, 1500 to 2000 feet or better, and underground mining would be required. If the tenor were about 0.8% copper, as at present, and several hundred million tons were found, then the economics would be about similar to those at San Manuel and a high price for copper would be essential.
- 2 - An adequate water supply remains a very serious problem.
- 3 - Underground caving would probably damage PD surface workings, and they would have recourse to an injunction to stop neighboring mining.

The latter point brings up the question as to Ajo's remaining life. At present they are depleting reserves at the rate of about 9 million tons annually. Assuming a substantial ore body were found on Bluestone ground, it would be about 8 years from the date of the initial discovery hole until an independent operation was set up and producing copper metal. What would PD's reserve position be then and might they be inclined to be cooperative on a custom basis?

I have read Ted Dodge's memo of August 24, 1948, with more appreciation than when I went over it 6 years ago. He brings up some good points, and it surely looks like the U.S.G.S. plans and

July 30, 1955

sections, whatever the reason may be, do not give the full picture.

If you can get the Bluestone ground on favorable terms and the Copper Ridge group, I think you would have a good gamble on the southeasterly trend.

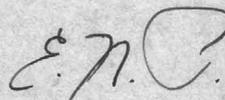
To cover the situation on the less-favored (by me) southwesterly trend, the Malone and Cardigan groups would be needed plus the ABC claims, if available. I seem to recall that John Hope told me that PD had acquired the A, or B, or both; no doubt you have the exact information on this matter.

There is one other point that bothers me. The association of the Ajo ore body with abundant vein magnetite makes an aeromagnetic survey a must, and this should be followed by magnetic surveys on the ground. PD has done considerable magnetic work around Bisbee, I believe from the air. Surely they must have taken a whirl at Ajo, even though the fanglomerate cover is very deep.

This is a very disjointed and unorganized memo, as again I am in a hurry and plan to leave for the Copper Range on August 4. My conclusion is that you would have a legitimate gamble on the Bluestone and Copper Ridge groups. It would sure be fun to stir up Douglas with a little action on this ground.

With kind regards,

Yours sincerely,



ENP:bhs

COPY

June 9, 1949

Mr. Chester D. Tripp, President
Consolidated Coppermines Corporation
310 South Michigan Avenue
Chicago 4, Illinois

Dear Chester:

On May 23 and 24, 1949, I visited the Ajo mining area, Pima County, Arizona, in company with Mr. John Hope, Jr. Unfortunately my trip to this district has been repeatedly delayed due to urgent business in other parts of Arizona, and this present journey was made in more of a rush than was desirable. The following memorandum does not attempt to thoroughly cover the proposed Ajo project. It only considers certain phases of the subject which I believe have not been accented in earlier discussions. It will be assumed that the reader has at hand Mr. Hope's report of September 9, 1948, entitled "Property Consideration at Ajo, Arizona" with his accompanying property map, and also at hand the more comprehensive report by Mr. John Payne, Jr., of the American Metal Company under date of February, 1949, entitled "Ajo Mining District, Pima County, Arizona" with attached maps and an accompanying memorandum by Mr. Theodore A. Dodge. It will also be assumed that the reader is familiar with U. S. Geological Survey Professional Paper No. 209 entitled "The Ajo Mining District, Arizona," by James Gilluly, published in 1946.

The situation before us is this: Phelps Dodge Corporation does not own nor control all of the property surrounding its open cut copper mining operations at Ajo, particularly on the south and west. This ground, if acquired, might offer two means for profit: (1) Some of the ground is so closely adjacent to the pit that Phelps Dodge must eventually conduct mining operations in it if they are to extract all of their own pit ore and (2) there is a good chance that some of this flanking property may contain extensions of the ore body. Amongst other things we must consider the opportunities for finding ore on these flanking properties, the possibility of mining at a profit any ore found, and the terms for acquiring as much surrounding property as might be needed. A very important speculation that cannot be avoided is to consider why Phelps Dodge itself has not already purchased this ground if it really has any merit.

At first glance, the chance for finding ore body extensions to the southwest appear excellent. This resolves itself into two problems, one having to do with the possible extension of the favorable porphyry into this flanking area and the other being a consideration of the possibility for such extensions to be economically mineralized. When we look at the first problem more closely, as brought forward in some detail by Gilluly's plate 24, we see that we are not dealing with

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June 9, 1949
Mr. Chester D. Trapp, President

the possibilities for a clean and normal extension of a regularly-formed intrusive body, but rather are we hoping for a protuberance on an irregular, streamer-like wing of porphyry. Here enters the first uncertainty, and we cannot predict with any confidence whether or not such an extension occurs to form a body big enough to be really worthwhile.

The zone in which we might search for such extensions is now deeply buried. The porphyry was intruded into a series of earlier volcanic rocks, and the two were later buried by a thick accumulation of gravels. This area was later radically tilted down to the south so that the zone in which we are interested becomes progressively deeper toward the south, with the result that more difficulties and expense will accrue to its exploration.

Assuming that such extensions exist to the southwest, we have no assurance that they carry worthwhile copper mineralization, although from a general consideration this would seem to be a reasonable expectation. The effects of hydrothermal mineralization now displayed on the surface are not decisive. The significance of the widespread distribution of specularite (primary hematite) is debatable. For example, in some parts of the Bisbee and Ely districts this mineral is associated with good ore; at Miami it is intergrown with calcite and chalcopryrite in mediocre deposits on the far western edge of the district; and in northern Yuma County, Arizona, specularite is widespread but seldom has been found associated with profitable ore bodies. A thorough geological study of the area in question would naturally consider the subject of hydrothermal alteration in much detail, but there is no assurance that this would result in definite encouragement for or against exploration. Gilluly's work already shows that the patterns of copper mineralization and specularite distribution are not in symmetrical arrangement. Consequently the use of the latter as a guide to the former may be very unsatisfactory. In all of this type of work care must be used to distinguish between the distribution of specularite (primary hematite) and supergene hematite ("relief limonite") indicative of the former presence of chalcocite in rocks now exposed at the surface. Dodge in the third paragraph of his report intimates that he has not maintained this distinction.

Flanking Phelps Dodge there are a number of property groups of diverse ownership, although the same individual may be part owner in several properties. Of these the following groups are important:

- 1 - Cardigan Group
Owners: Baker and Zitlau
- 2 - Firefly, or A Group
Controlled by: W. A. Knox

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Mr. Chester D. Tripp, President

- 3 - Bulldog, or B Group
Owned by Baker, Price and Zitlau
- 4 - Colorado, or C Group
Owned by Hoval Smith (?)
- 5 - Mertz claims
Owned by J. J. Mertz
- 6 - Copper Sulphate, Last Chance, & Eagle claims
Owned by Baker, Price and Zitlau
- 7 - Malone claims
Owned by Malons
- 8 - Bluestone property
Controlled by Hoval Smith and Mrs. Van Dyke.

Of probable less importance are the following:
- 9 - Babbitt Group
Owned by Babbitt Estate
- 10 - Copper Ridge Group
Controlled by Steele brothers.

A glance at the maps in Mr. Hope's and Mr. Payne's reports will show the physical position of these various property groups. If we project the axis of the open pit southwesterly and assume that this marks the locus of a possible extension of the ore body (and this fits in reasonably well with the geology), we see that the following claim groups may be particularly valuable:

- 1 - Firefly, or A Group
- 2 - Bulldog, or B Group
- 3 - Colorado, or C Group
- 4 - Malone ("A") claims
- 5 - Mertz claims
- 6 - Copper Sulphate, Last Chance and Eagle claims
- 7 - Northeastern tip of Cardigan Group
- 8 - Northwestern portion of Bluestone property.

If we take the average thickness of a theoretical ore body at 300 feet, then a square inch (2,000 feet on a side) on Mr. Hope's and Mr. Payne's property maps would mark the site of 96 million tons. If we assume the bottom of this theoretical ore body to be at a depth of 2,000 feet and further assume a "caving angle" of 45 degrees, the area liable to be disturbed by its underground mining by block caving methods would be 6,000 feet on a side, covering 9 square inches on our maps.

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Mr. Chester D. Tripp, President

Although it might be argued that this extensive surface damage would not result, nevertheless there is sufficient likelihood that such would be the case and enough expert testimony could be brought forward to make it almost certain that the Court would protect an established industry by granting Phelps Dodge an injunction against a project so threatening them. Other property holdings would no doubt be granted similar protection. Consequently areas where deep underground mining might be permitted would be well out to the south and west where the finding of an ore body would be more speculative, and where, because of increasing depth, its finding and preparation for mining would be slower and more costly.

Thus if a second mining project is to be established underground in the southwestern part of Ajo, all of the property groups listed above would need to be controlled. If the A (Firefly) group is not acquired, as suggested by Mr. Payne, then underground mining operations would have to be moved that much farther outward. As has been brought forward earlier, if additional ore exists to the south and west, it probably occurs at considerable depth. Therefore its drilling and preparation for mining would require ample time, during which a substantial proportion of the property payments would fall due. Exploration and mine preparation would be costly and much capital would be tied up. Any return on this investment would be subject to considerable delay, and such a project would need to be financed by a strong group not in a hurry for dividends.

From a rapid examination it seems very likely that some of the Ajo pit ore body must extend into the northeasterly portion of the A, B, and C groups. Furthermore, the pit is so close to some of these properties that Phelps Dodge will eventually need to strip back onto them to release part of their own ore for shovel mining. Just when this time will occur is speculative, but it may be in from 6 to 10 years. At this time the owners of closely adjacent ground will be in a strategic position to get something substantial out of Phelps Dodge, but Phelps Dodge also will be in a strong bargaining position. They can offer to mine and beneficiate their neighbors' ore on a cost plus basis whereby the neighbors can gain a profit without the necessity of making any capital expenditure. Of course the neighbors can refuse and demand their pound of flesh. With this possibility in mind, we are permitted to speculate regarding why Phelps Dodge has not gained control of this flanking ground in past years. It will not profit us to pursue this speculation too far because, after all, we are only guessing, but I believe the following factors to apply: (1) The amount of ore marginal to the pit already discovered; (2) the personalities involved; (3) the possibility that property prices would go down in the future; (4) even if prices remained the same, there was a savings to be made by not tying up the purchase price money at an early date; (5) the probability that Phelps Dodge could protect itself by injunction and thus stymie their neighbors until they were ready to enter into a deal.

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Mr. Chester D. Tripp, President

I personally believe that Phelps Dodge's behavior points to the likelihood that no great amount of ore has been found along the westerly and perhaps the southerly margin of the Pit. An active diamond drilling campaign was under way in 1936 and 1937 (which was after Gilluly's investigation for the Geological Survey) and Phelps Dodge has usually been keen to employ competent geological work to guide their exploration. Theodore Dodge points out that the New Cornelia ore body seems to die out within Phelps Dodge ground, as judged from the illustrations accompanying Gilluly's report, and he infers that one reason for this impression might be because Phelps Dodge or Gilluly withheld information from the published description of the district. In this respect we must remember that Gilluly could publish no more information than Phelps Dodge released to him, and, considering everything, I think Phelps Dodge was quite generous. Furthermore, the diamond drilling campaign at Ajo continued for several years after Gilluly completed his work there. There are a number of holes missing from the published data, as mentioned by Dodge, and it is probably true that some of these were drilled at the time Gilluly was there, but such logs were not released to Gilluly by Phelps Dodge. Some of these may have shown ore, but it does not necessarily follow that all of them did. It may be that Phelps Dodge found attractive leads to an ore body extension and believed that they could control the situation by that corporation's strategic position, but my guess is that ore marginal to the pit is in such amounts that a full disclosure of the data pertinent to its occurrence would not necessarily encourage a second mining project.

Secondly, it is common knowledge that some of the property owners have been difficult for Phelps Dodge to deal with. By deferring property purchases, it was possible that some might pass to into estates when their owners became deceased, thus removing some of the difficulties. The other points listed above require no further discussion.

In summary, any real ore body found to the south and west could only be mined in the near future if it were distant enough so that its extraction would not cause subsidence in Phelps Dodge ground or other outside properties. In this position exploration would be much more speculative, and any ore body found would probably be deep thus necessitating slow and expensive exploration and preparation for mining. Under these conditions considerable early capital commitments would be necessary, and return of capital and profits might be deferred for many years. Consequently such a project, in my opinion, does not appear too attractive from the standpoint of Consolidated Copper Mines Corporation. I think we could get a better run for our money by spreading it into several projects elsewhere.

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Mr. Chester D. Tripp, President

Some profit seems more assured from gaining control of any or all of the A, B, and C groups. Certainly there must be some ore in this ground, but Phelps Dodge can probably defer its extraction by Court action until it suits their convenience. Acquiring these properties would obviously be because of their nuisance value, and if they contain no great amount of ore, as published data seem to indicate, we would be faced with a loss. At best, profits would be deferred for many years while a considerable sum of money is tied up.

Yours very truly,

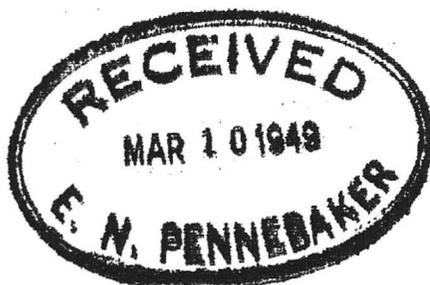
E. N. Pennebaker

AJO MINING DISTRICT
PIMA COUNTY, ARIZONA

By

JOHN PAYNE, JR.

February, 1949



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S U M M A R Y

INTRODUCTION

Mr. F. H. Stewart and I spent January 27th, 28th and 29th in the Ajo District. We would have written a joint report but there was insufficient time to do so while we were together in Arizona. However, we discussed the principal points contained herein and I believe that Mr. Stewart is in full agreement. A copy of this report is, of course, being sent to him for his comments and he will make any corrections or additions which he desires.

SUMMARY

We believe that the areas south and west of the Cornelia pit hold excellent possibilities for the discovery of a porphyry type copper deposit. There are two principal areas involved, the Cardigan and the Bluestone.

Cardigan Area:

There is definite evidence that the eastern part of the Cardigan area, adjoining the pit, contains mineralized porphyry at depths from around 400 to perhaps as much as 1,000 ft. below the surface; the thickness of the porphyry is unknown, nor is the grade necessarily economic, but it is difficult to imagine a more attractive area in which to drill for an ore body. This eastern part of the Cardigan area includes the A, B and C groups (see maps), which will be discussed in detail later. To the west of the A, B and C groups is the Cardigan group of claims, the Malone claims and open ground. This area also holds sufficiently attractive possibilities to justify drilling, but here the evidence that porphyry or ore will be found is far less conclusive. This western part of the Cardigan area is covered by volcanics or fanglomerate at the surface; there is no direct evidence that porphyry exists at depth and the alteration is less pronounced than in the area nearer the pit. However, there is some mineralization and alteration and it is entirely possible that porphyry may be found at depth; at least this chance makes it well worth drilling a few exploratory holes to test the area.

Heretofore we have regarded it as essential that the A, B and C groups all be optioned to justify a project at Ajo. Our conclusion after this examination is that the C, or Colorado, Group is essential and is the key to the situation, but that we could have a worthwhile undertaking without the A or B groups, even though both contain exceptionally attractive ground. Terms quoted to us to date indicate that options on the C and B groups could be satisfactorily arranged and the terms on the A group were the unreasonable ones (\$500,000 with \$25,000 down).

Provided the C group can be satisfactorily optioned, we would also require, as a minimum, the Cardigan group, the two Malone groups, and the open ground to the south of these groups (see map). It would be preferable also to have the B group, Babbitt group and Mertz claims, and we believe that acceptable options can be arranged on these.

It is probable that some cash would be involved in any deal on the A, B or C groups; these groups have real physical value and obvious ore possibilities and we could not expect to acquire them on long-term free options. We believe that some cash is justified on this ground, provided the other ground required can be optioned on terms which allow three to six months for a geologic examination and four years for drilling, before any substantial payments.

We have not yet been able to contact all of the owners but the following are the terms quoted to date:

	<u>Option Period</u>	<u>Cash Payment</u>	<u>Yearly Payment</u>	<u>Total Price</u>	
C or Colorado Group	10 yrs.	\$7,500	\$7,500	\$75,000	(1)
Cardigan Group	4 "	none	none	60,000	(2)
Copper Sulphate, Last Chance and Eagle Claims	4 "	none	none	30,000	(2)
Bulldog and Trainage Claims (B Group)	6 "	\$12,500	\$12,500	\$75,000	(3)
Mertz Claims	4 "	none	none	20,000	(2)

Malons Groups - Malons indicated that he would accept our four-year option terms but did not state a price and he may want some cash payment when we get down to serious negotiations.

Babbitt Group - We have not discussed exact terms with Babbitt but preliminary conversations indicate that he is reasonable.

A or Firefly Group - As stated above, the option price on this group is \$500,000 with \$25,000 down and \$25,000 per year for 20 years.

Notes:

- (1) Last terms quoted in 1948 but must be confirmed.
- (2) Under the four-year options, payments after four years would be on an annual basis with the amount per annum not yet fixed.
- (3) These were the terms by which Hoval Smith optioned the B Group in 1948; in January, 1949 Zitlau confirmed the total price but did not discuss the stated payments.

In regard to all of the above, we believe that if we leave out the A or Firefly Group or arrange more acceptable terms on it the other options are acceptable, and if agreements can be worked out as summarized above, we should go into the project. We should, of course, hold any cash payments to the lowest possible figures, and any such payments could only be made after titles were checked and, if possible, after a preliminary geological examination.

Bluestone Property:

This group covers the possible southern extension of the pit ore to the south. Attached is a copy of Mr. Dodge's report which discussed the possibilities of finding ore on this group and indicated depths at which it might exist. The area is covered by at least 1,000 to 1,500 ft. (or more) of fanglomerate; therefore, to test it by drilling would require holes say 2,000 or 2,500 ft. deep and would be an exceedingly expensive project. Hoval Smith drilled two holes which apparently entered mineralized but below grade porphyry at 1,500 and 1,668 ft. respectively. That there is a good chance of finding a porphyry deposit on the Bluestone is hardly open to question, but the economics are highly uncertain. First the project would be very expensive and, second, the terms asked by Smith are entirely out of reason; i. e., a total price of \$5,000,000 with \$100,000 down and very stiff drilling obligations.

We do not believe that Smith would agree to reasonable terms and do not propose to carry on further negotiations with him, but we should keep in touch with the situation because some day it might be possible to test this ground on a satisfactory basis.

Copper Ridge Group:

This ground was not mentioned earlier because we know very little about it and we are, therefore, not prepared to make any specific recommendations regarding it. If there is a southeastern continuation of the pit ore, it would extend into this group, but probably at depths of say 1,000 ft. or more. It is reported that ore was shipped from surface veins on this group and these should be examined. P. D. badly needs some of the area for dump room. We carried out preliminary discussions regarding terms with the owners and this will be discussed later.

Comments on Phelps Dodge Operation:

We had no difficulty in locating the claim lines of properties adjoining the pit; P. D. has mined or dumped to within feet of its property lines on the west and south. The operation is definitely hampered by lack of space and ore is being left, all of which causes P. D. needless expense and is an economic waste. It is difficult to understand how a large company could let itself get in such a position.

We left the area with the impression that the small property owners would sell to anyone else at less than to P. D.

Relations with Phelps Dodge:

If we were to take over only ground adjoining the P. D. pit (particularly the A, B and C groups), this could be interpreted by P. D. as acquisition of a nuisance value on its doorstep. We would certainly not do this. However, I see no reason whatsoever that we should eliminate the Ajo District merely because P. D. has an operation there. If we acquire a large block of ground

which would in itself constitute a legitimate exploration project, I believe that we would be fully justified in including the A, B and C groups; these groups would be just as contiguous to our ground as to P. D.

This is, of course a matter of policy.

General Comments:

Testing of the Cardigan or the Bluestone area is a more attractive undertaking than most exploration projects which have been or are being carried out by the major companies. This is a geologic bet and not an assured thing, but the chances for success are greater than in most such projects. It is an out and out gamble, but a good one.

South of the Cardigan area there is open ground which must be staked if we undertake this project. The policy as to staking this ground must be determined at the outset.

If we decide that in principle we wish to go ahead with this project, the first step will be to negotiate on the various properties, especially the Colorado or C group.

Although we considered the Ajo District as far back as 1940, our current interest has developed as a result of the A, B and C groups having been brought to our attention by Coppermines in 1948. At that time a joint venture was contemplated, but the matter was dropped because of the terms. We continued studying the possibilities and the current recommendations are the outgrowth of those studies. I believe that we should offer Coppermines a participation if we undertake this project.

This is the type of undertaking on which we might wish to share the risk. We previously considered Calumet & Hecla as a possible partner.

Estimated Costs:

Until we know the terms, no estimate can be made as to the total out-of-pocket costs involved. As a rough guess, I believe that it will require approximately \$150,000 for the geological work and drilling program which is recommended if the properties can be optioned on acceptable terms. Any property payments would be in addition to this amount.

RECOMMENDATIONS

1. We should go into the Cardigan project, provided acceptable options can be arranged.
2. The first step would be negotiations with property owners.
3. As soon as we believe that options can be worked out, we should stake the open ground discussed herein.
4. The Bluestone property probably merits drilling on a long term option and satisfactory price, and we should keep in touch with this property even though terms offered to date are out of reason.

DETAIL

GENERAL

If we go into this project, we must assign certain people to carry it through. I recommend that the entire project be put under Mr. Stewart but that Mr. Roberts be asked to spend full time on dealing with the property owners. We must either let it go or follow up promptly and vigorously. Mr. Stewart is fully informed as to past negotiations and current conditions and he could direct Mr. Roberts throughout. When the necessary properties are tied up, a full scale geologic examination, with a complete mapping job and perhaps geophysics, will be necessary. It is probable that Dave Dill would be available for this.

Little can be said as to tonnage possibilities or grade. The only basis for comparison is the Cornelia ore body. In 1933 ore reserves at Ajo were reported to be (Parsons: "The Porphyry Coppers") 170,000,000 tons at 1.25% Cu. During the early stages of the operation it appears that the grade was 1.00 to 1.50% Cu. During the year 1947 (the last year for which data are available) the recovered value was 14.2 lbs. copper per ton of ore milled, or 0.71% Cu. recovered.

There is a report that the two drill holes on the Bulldog claim (B group) entered porphyry at about 450 ft. and passed through 300 ft. of ore at 1.3 to 1.5% Cu. but another report is that the grade was 0.5% Cu.; neither can be depended upon unless logs and cores can be inspected. All information indicates that porphyry should have been found at the depth reported; i. e., about 450 ft.

In regard to tonnage possibilities, if the pit ore extends under even a substantial part of the A, B and C groups they could contain on the order of 50 to 100 million tons, or more. If there is another sheet of porphyry beneath the Cardigan group and/or adjoining ground, there is ample room for a major porphyry copper deposit.

RELATIONS WITH PHELPS DODGE

The relations between Phelps Dodge and the various property owners in the Ajo District do not appear to be very friendly or cooperative. Evidently P. D. has followed a policy of attempting to starve out the small people and acquire their claims at its own price. That this policy has not worked out is proved by the fact that the P. D. operation is today seriously hampered not only because part of the ore body extends into adjacent ground, but also for lack of space for dumps.

A guess as to the reasons that some other company has not gone into the Ajo District are:

- (a) It has always been regarded as P.D.'s back yard.
- (b) Perhaps the geologic possibilities of the adjoining ground have not come to the attention of other companies.
- (c) The owners of property adjoining one pit have asked unreasonable terms.

How P. D. will react to our undertaking a project at Ajo is unknown. They might resent it but, on the other hand, they have had ample opportunity to acquire this ground and have not done so. Furthermore, the ground which we would acquire would constitute a legitimate separate undertaking and could not be regarded by P. D. as acquisition of a nuisance value by us.

This is, of course, a matter of policy rather than an engineering problem, but I personally believe we should not allow possible resentment by P. D. to deter us from going into this undertaking.

NOTES ON THE PHELPS DODGE OPERATION

The Cornelia pit at the surface is now approximately 5,000 ft. long by 3,500 ft. wide with the long dimension striking west of north. The maximum depth is judged to be 500 to 700 ft. The shape of the pit is unquestionably influenced by property lines. It is evident that ore extends south and west in the wall of the pit, but has not been mined because Phelps Dodge does not own the adjoining ground. The southwest wall of the pit is too steep and we noticed that men suspended by ropes were barring down loose boulders from the wall of the pit.

In the southern continuation of the pit the overburden is increasing because the porphyry is plunging under the volcanics. Dump room for the waste is obviously a serious problem for P. D. and the dumps extend to the exact limits of the property line. Failure to acquire adjoining ground has cost P. D. large sums due to difficulties in waste disposal.

The northeast corner of the A group is easily found on the ground and is about 6 ft. from the edge of the pit. Here again it is clear that P. D. operations are hampered and that ore is being left in the southeast edge of the pit adjacent to the A group.

It is inconceivable that a large company would have permitted itself to be so hemmed in due to lack of vision in acquiring adjoining properties. This policy has cost needless money in transportation and is an economic waste because ore is being left which it will cost more to mine later.

GEOLOGY

General:

The Ajo District has been described in U.S.G.S. P.P. 209 and in our files there are several letters and memoranda dealing with certain features of the geology as applied to possible extensions or new orebodies. No effort is made here to review completely the geology but the following highlights are included to show the geological aspects of the proposed program. Attached hereto in the Appendix is copy of a letter by Mr. T. A. Dodge which brings out some pertinent points and is an excellent analysis of possible interpretations of the data presented in P.P. 209.

The Cornelia ore body is a porphyry deposit in monzonite. The ore-bearing monzonite is a sheet or cupola extending from a larger mass which is exposed north of the pit. After emplacement of the monzonite and ore deposition there was a period of erosion during which a post-mineral fanglomerate formation was laid down. This was followed by large scale faulting which tilted the entire area under consideration about 50° to the south.

The lacolithic sheet of ore-bearing monzonite originally made an angle of about 30° with the surface but due to the tilting it is now inclined about 20° to the south. Therefore, as mining progresses downward with regard to elevation it is increasingly higher geologically.

In the mine area the monzonite is intrusive into Concentrator volcanics, and apparently some ore occurs in the latter.

Evidently a considerable part of the Cornelia ore body was eroded away during the period of fanglomerate deposition, for the latter contains many mineralized boulders.

Faulting and Structural Trends:

The geologic maps in P.P. 209 show the marked east-west trend of the pre-mineral feldspathic andesite porphyry and hornblends andesite dikes (the Hospital porphyry dikes are post-mineral). East-west fissures are reported on the Copper Ridge group. All of this implies north-south elongation or stretching and shortening in an east-west direction. If this structural environment existed during the emplacement of the monzonite, it follows that apophyses from the main mass of monzonite might have their long dimensions in an east-west direction.

The implication of this is that the ore-bearing sheet of monzonite might extend to the east and/or west of the pit. The evidence presented herein suggests that the monzonite extends under the A, B and C groups and the

northern part of the Bluestone. Thus it appears that the mineralized monzonite exposed in the pit is only a part of a much larger body. It is, of course, not at all certain that the entire body will contain commercial ore, but testing it by drilling is unquestionably an attractive undertaking.

The Ajo District is a fault block bounded by the Gibson fault on the west, the Ajo Mountain fault on the north and the Black Mountain fault on the east. The Ajo Mountain fault was the plane responsible for the hinge movement which resulted in tilting the entire block about 50° to the south.

Gibson Fault:

P.P. 209 expresses the theory that the Gibson fault was responsible for shearing off the upper part of the monzonite and moving it down and to the east. In other words, the monzonite east of the fault was originally the upper part of the large monzonite mass now in the footwall of the fault. Lacking any evidence to the contrary, we are going along with this interpretation. In the footwall of the Gibson fault the rocks are monzonite and pre-Cambrian gneiss. It is significant that west of the fault no dikes have been mapped in the monzonite whereas to the east dikes are abundant.

We believe that the Gibson fault is the western boundary of the area which merits testing. Any ground which might be acquired to the west of this fault would be the extension of a group covering ground to the east, or claims to be acquired for protection or dump space.

Alteration:

Dodge has ably discussed the alteration in his letter (attached in the Appendix). His study, like ours, was too brief to more than sum up the obvious features and call attention to certain possibilities.

The Concentrator volcanics which overlie the orebody in the southern part of the pit show characteristic porphyry-type alteration; i.e., silicification, bleaching and violet-pinkish tinge so commonly found in rocks associated with porphyry deposits. The pronounced red hues so noticeable around many other porphyries are lacking at Ajo; perhaps specularite at Ajo is the equivalent of the iron oxides responsible for the red coloring elsewhere. From our very brief inspection we did not run across as much sericite as would be expected around most porphyries.

We compared the alteration adjacent to the pit to that to the west. We were favorably impressed as to both the character and intensity of alteration on the A, B and eastern part of the C groups. To the west, on the Cardigan group, the bleaching and clay-mineral alteration decrease; the silicification persists, but this may be so regional that its significance is less. The weaker alteration to the west may mean: (a) that the porphyry does not extend in this direction, or (b) that if porphyry exists beneath this area it is either at such a depth that the alteration did not extend to the surface or it is not mineralized.

Although specularite should perhaps not be classed as an alteration product it must be mentioned in connection with the geology and ore localization. In the Concentrator volcanics adjacent to the pit ore there is abundant specularite, most of which occurs in small fissures. Specularite is also abundant in the Cardigan area, especially on the A, B and C groups and in the western part, just east of the Gibson fault, but it is found in varying amounts throughout the entire Cardigan area. The meaning of the specularite is unknown; at some camps it occurs close to the ore and elsewhere it appears to be a far-traveller. The only thing that can be said is that at Ajo it is not unfavorable because it is abundant near the pit ore.

If we go into this project an alteration study should be carried out in conjunction with the geological mapping which would be the first step in the program.

Cardigan Area:

There is evidence that the ore-bearing porphyry in the pit extends to the south and west under the A, B and C groups. This evidence is:

1) Both C. A. Baker and Walter Zitlau have told us that two holes were drilled on the Bulldog claim and that they penetrated porphyry at about 450 ft. Baker showed us the collar of one of the holes. Baker said the holes cut 6 ft. of high grade chalcocite at the top of the porphyry and then continued in mineralized porphyry which averaged about 0.5% Cu. Zitlau said that the holes passed through 300 ft. of ore averaging 1.3 to 1.5% Cu. Unless we are able to inspect the cores and logs, we are inclined to doubt the grades quoted by Zitlau, but we are ready to accept the reports that the holes entered mineralized porphyry at about 450 ft.

2) If the cross sections of P.P. 209 are extended to the west, they would show that the porphyry should project into the A and B groups. In the area of the drill holes on the Bulldog claim the top of the porphyry should be at about 400 or 500 ft. below surface and in the southern part of the A group the depth should be around 1,000 ft.

3) Alteration has been discussed but it should be mentioned here that where the Concentrator volcanics outcrop on the A and B groups and in the eastern part of the C group, the alteration is comparable in kind and intensity to that adjacent to the pit ore. This suggests that mineralized porphyry may be found beneath this area.

4) On the A and B groups and the eastern part of the C group there is abundant specularite and some copper-bearing cracks. We are uncertain as to the significance of the specularite but it is abundant in the overburden being stripped from above the pit ore and, by comparison, its presence is favorable. Any evidence of copper is, of course, a good sign.

The possibilities of the area west of the A, B and C groups are less obvious. Silicification appears to be as abundant in this area as it is near the pit, stringers and blebs of specularite are found in many places, and there are occasional veinlets and seams which show copper stain; bleaching or clay-

mineral alteration decreases as one moves west from the pit area. Further study and interpretation of the alteration features might shed more light on the meaning of these features. Did the specularite and copper travel laterally from the pit mineralization or are they surface evidence of leakage from ore beneath this area? As the maps show, the western continuation of the monzonite mass outcrops north of the Cardigan area; it is entirely possible that a sheet or cupola from this mass lies buried beneath the Cardigan group or surrounding ground.

Bluestone Property:

The entire Bluestone property is covered by fanglomerate or alluvium. A discussion of the geology is therefore confined to interpretations of P.P. 209, which Dodge has done in some detail, and remarks on the two holes drilled in the northwest part of the group.

These holes are shown on the map. According to the reports which we have, hole No. 1 entered porphyry at 1500 ft. and continued in it to the bottom of the hole at 2000 ft. Hole No. 2 entered porphyry at 1668 ft. and continued in it to the bottom at 2050 ft. The 500 ft. of monzonite cut in the bottom of each hole was mineralized, averaging 0.24% Cu. over the full distance and as high as 0.99% Cu. over 30 ft. Watson Fritz of Miami, Arizona is supposed to have these cores and we should arrange to examine them if we go into this project. - John Hope of Coppermines might help arrange this.

P.P. 209 interprets the contact between fanglomerate and older formations as an erosion surface. The results of holes 1 and 2 suggest that the contact may be a normal fault or that the surface flattens rapidly going south. If the monzonite shown on the P.P. 209 sections is extended to the south, rather than ending against an erosional fanglomerate surface, it would project almost exactly to the elevations at which it was cut in these drill holes. My conclusion is that P.P. 209 is wrong. This would not be the first instance where it can be shown that P.P. 209 either withheld information or fudged it, a sad situation for a U.S.G.S. paper but almost certain to be the case in this instance.

TONNAGE AND GRADE POSSIBILITIES

Anything which can be said in this regard is purely a guess.

I estimate that the Cornelia pit has produced not less than 200,000,000 tons at an average grade of not less than 1.00% Cu. That present ore reserves are ample for many years' operation are proved by the fact that P.D. is now building a smelter at Ajo.

The tonnage possibilities of the A, B and eastern part of the C groups alone are illustrated by the following: If an ore body averaging 300 ft. in thickness extended under only one claim there would be 22,000,000 tons. This report endeavors to show that several claims of the A, B and C groups may well contain an extension of the Cornelia ore body, which is an average of at least 300 ft. thick. Therefore, it would require that ore 300 ft. thick extend under only five claims to amount to 100,000,000 tons. These figures merely illustrate that possibilities for major tonnages do exist.

WATER SUPPLY

Ajo is located on a desert where water is one of the principal problems. To solve this P.D. has developed a "water mine" which consists of several miles of underground workings and is 600 or 700 ft. deep. If we were successful in an exploration program at Ajo, we would be faced with a comparable problem. However, in the area which we propose to option, water stands in wells at depths as shallow as 27 ft. and there would be ample water for the preliminary program. If we find a worthwhile orebody I am sure that a water supply would not be an insurmountable obstacle.

MINING

Any ore found by the contemplated project would have to be mined by underground (block caving) methods. It would be buried too deeply to permit open pit mining.

TERMS AND PROPERTY OWNERSHIPS

The attached map shows the properties. We have a detailed claim map of the district but this does not show all of the individual claims, and some shown may be in error. It would be necessary to inquire fully into the claim ownerships and locations in order to obtain a complete and authentic claim map. Such an investigation would doubtless show open fractions and irregularities in some claims, so that some staking would have to be done and amended locations would probably be required in some cases.

In talking with the property owners we have explained that in order to undertake an exploration project we would require a large area with terms which would permit three to six months for a geological examination and four years for drilling, with no substantial payments until completion of the drilling program. We could drop any option at any time, but would agree to carry out drilling during the four year period; such drilling would be on a "block" basis, that is, drilling on any part of a group of properties would satisfy the drilling requirements on all of them. After four years there would be stated payments and probably a royalty applicable on a total upset price. The owners with whom we have talked to date have indicated a willingness to go along on the above general terms. Because some of them have no means of support, it would probably be necessary to make monthly or yearly payments sufficient to support them during the option period, but if this should be necessary we believe that the amounts would not be burdensome.

Cardigan Area

Cardigan Group:

Additional data on this group are contained in the Appendix. There are 27 claims in the group. Walter A. Zitlau, 3551 33rd St., San Diego (Phone: Randolph 2342) would control the negotiations. It may be (see Bongard's letter of August 26, 1948) that Baker allowed three claims in this

group to lapse by failure to file notices of intention to hold and that these claims were relocated by Tom Alley and Bob Hodge of Ajo, but this should cause no trouble because Alley and Hodge said they would turn the claims over to Baker if a deal were made. Zitlau is asking \$60,000 for the group.

Copper Sulphate, Last Chance and Eagle Claims:

These three claims form the northeastern part of the Cardigan group shown on the attached map. The Copper Sulphate and Eagle are shown on our claim map but the Last Chance is not. These claims are owned by Baker, Price and W. A. Zitlau and the latter would handle the negotiations; he is asking \$30,000 for them.

Bulldog or B Group:

This consists of the Bulldog and the Triangle patented claims which are owned by Baker, Price and Zitlau. W. A. Zitlau would handle the negotiations and he told Mr. Stewart that he wants \$75,000. The terms are unknown but there would doubtless be some cash involved because these claims are next to the pit and have real physical value.

We have a copy of an option obtained by Hoval A. Smith in 1948 from Virginia Zitlau; Rosie Virginia Price, of Wilmer, California; Gordon A. Baker, of Ajo; and Walter A. Zitlau, of San Diego. This shows that the Bulldog patented claim, survey 4240, is owned by Virginia Zitlau; the Triangle patented claim, survey 4241, is owned by the other three people mentioned above. The terms of this option, now expired, were \$12,500 down and \$12,500 per annum until a total of \$75,000 had been paid.

According to Stewart's letter of February 7, 1949, Zitlau would insist that no open cut or strip mining be carried out on these claims until they were purchased. The object of this would be to prevent removal of Arkansas Peak during an option period, because if it were removed P.D. could mine the pit a considerable distance further to the west than is now possible.

Mertz Claims:

These consist of the Fracture and Fracture No. 1 (previously the Commonwealth claims). They are owned by J. J. Mertz, 1569 Union St., San Diego (no phone). Walter Zitlau would handle the negotiations and says the owner wants \$20,000.

Colorado or C Group:

We are not absolutely positive as to the ownership of the claims in this group. We understand that Hoval Smith purchased the Colorado, Colorado 2, Colorado 4 and Campo from Elis Malone for a total of \$8,000. It is possible that the deed to these claims is that referred to in correspondence during May and June, 1948 between Mr. Brenner and Walter Roche of Phoenix. If so, the deed had not then been recorded but was in the possession of H. S. McCluskey of Phoenix (Hoval Smith's lawyer) and was a deed of January 17, 1948 from Elis Malone and Mabel Malone, his wife. Some escrow arrangement was mentioned in

connection with this deed but nothing regarding it was clear. Malone owns the Colorado 5, 6 and 7 which join the C group on the south and southwest (see map).

We have not discussed terms with Hoval Smith but he previously asked \$75,000 for the Colorado group (presumably all 7 claims) with a down payment of \$7,500 and annual payments of \$7,500 on a ten year option. We expect to contact Smith again regarding this group; i.e., the four claims which he evidently owns.

Malone Claims:

These include the Colorado 5, 6 and 7, mentioned above. Malone told us that he was agreeable to our terms; i.e., four year free option, but we have the impression that when it comes to actually making a deal he will go back on his statement and want payments of some sort. These three claims are shown in brown on the map.

Sunny Slopes Group:

This group of four claims is owned by Ada Jones, Malone's daughter, and he would deal for her. The remarks regarding Malone's claims (above) apply in this case as well. This group is shown in yellow on the attached map.

Firefly or A Group:

This group consists of the Firefly, Firefly No. 1 and Firefly No. 2 patented claims, survey 3590. In attempting to abstract this group in 1948 it was found that the patent is not on record. Presumably Knox has the patent papers but until they are recorded the title cannot be cleared. The claims are owned by the Little Ajo Copper Co., a defunct Arizona corporation. The taxes have been paid, probably by Knox. The Little Ajo Copper Co. is controlled by W. A. Knox, Foley, Mo. who claims to own 85% of the stock and in May, 1948 signed an option with Hoval Smith as president of the Little Ajo Co. The terms of that option were \$500,000 payable, \$25,000 down and \$25,000 per annum for twenty years. These terms are very harsh but we have written to Knox to see if a meeting can be arranged to discuss this matter. It is hoped that he might revise the terms, but this is probably wishful thinking. If he will not agree to better terms, we believe that we can leave out this group and have ample ground for our project.

Babbitt Group:

This group of 12 unpatented claims and the patented Mansion House claim are owned by the Babbitt Estate. George Babbitt Jr., George Babbitt Investment Co., 19 North San Francisco St., Flagstaff handles the negotiations. We have corresponded with him and Bongard discussed terms with him. He is evidently a reasonable man. We do not know what terms might be arranged but intend to discuss this with him within a month. He claims to have spent about \$40,000 on the claims. In the Appendix I have quoted Bongard's letter regarding his conversation with Babbitt.

Open Ground:

South of the Cardigan group, the Malone claims and the Colorado group there is open ground. If P. D. were to stake this ground, any project which we may contemplate would be effectively blocked. If others were to stake it, we would face dealing with them and this would involve additional property payments. If we stake it, we would have a position in the district, regardless of the outcome of present negotiations or decisions as to a drilling program. This is one of the most important points up for consideration. Perhaps this ground could be staked by an individual, Ed Roberts, for example. When we should stake this ground is very important because we do not wish to disclose our position prematurely and thus give advance notice to P. D.; yet it must be staked just as soon as it becomes evident that we have a good chance of successfully completing our other negotiations, otherwise others will surely stake the area and either block us completely or force us to deal with them. This is a very important point which must be discussed fully and handled carefully. I recommend that unless the decision is to reject this project, we stake the ground as soon as we believe that acceptable options can be arranged on the properties which we consider the minimum required to undertake this project. The owners already know that we are interested because we have talked with them. The only reason for not staking immediately would be not to offend P.D., and if we should decide that we must enter the district with P. D.'s blessing, we should forget about the whole thing, and therefore not stake the ground.

There is also open ground immediately north of Malone's Colorado No. 7 claim and west of the Colorado group; this is shown on the attached claim map. Malone called our attention to this open ground and he considers it as ground to which he is entitled; therefore we should leave it to him to stake it, or stake it for him if he so desires, but we should not try to stake it ahead of him.

Copper Ridge Group:

This group is controlled by the Steele brothers, 446 Hendshaw Road, Phoenix, Arizona. Mr. Stewart and I called upon the Steeles, and although we did not arrive at specific terms, we came away with the understanding that they would be agreeable to a long term free option. The total price would be \$77,000 payable to the stockholders of the old Copper Ridge Company under some complicated arrangement which we do not fully understand. The Steeles are also asking \$100,000 to be paid to the Copper Ledge Company. The relations between these companies are explained in Mr. Bongard's letter quoted in the Appendix. The corporate situation is evidently complicated and would have to be thoroughly checked if we were to do anything about this group.

P. D. Tax Group:

P. D. acquired tax title to a group of claims surrounded on the north and west by the Babbitt group and on the south by the Mertz claims. We understand that the original owners live in Kansas and could redeem by payment of taxes within five years from the date that they first became delinquent. This five year period has not yet elapsed, but I am sure we would not wish to interfere in any way in regard to these claims.

85 Group:

This group of 9 claims is owned jointly by Tom Alley and Bob Hodge of Ajo. Westney, the Philadelphia lawyer, is evidently agent for Alley and Hodge. To the best of our knowledge all of the claims lie to the west of the Gibson fault and we regard the ground as geologically unfavorable. The only reason for negotiating for this group would be to acquire protection ground. We saw Alley in Ajo and he indicated that a long term free option would be acceptable.

JOHN PAYNE, JR.

February 17, 1949

A P P E N D I X

This Appendix contains excerpts from several letters which contain data for reference but need not be included in the body of this report.

PROPERTY OWNERSHIPS

Bluestone Copper Company (from letter of Sept. 9, 1948 by John Hope)

This company owns some 385 acres of patented mining claims and in excess of 32 unpatented claims in the area immediately adjacent to and south of the Ajo pit. Mr. Hoval A. Smith has represented himself as owning or controlling all but a minority interest in this company. The Van Dyke Estate of Miami, Arizona was known to have some holdings in the company but it was believed to be of a minor interest.

On August 24th, I contacted Mr. Watson Fritz of Miami, Arizona who is secretary of the Van Dyke Estate. From him I learned that of the 4,000,000 shares of common stock issued to date in the Bluestone Copper Co., Mrs. Cleve Van Dyke personally owns 40.5%, Mr. H. A. Smith owns 41.1% and the remaining 18.4% is owned by outsiders. In addition to this common stock, some 88,000 shares of preferred (non-voting) stock have been issued of which Mrs. Van Dyke owns 85% and Mr. Smith owns the remaining 15%.

Copper Ridge Group (from letter of Aug. 26, 1948 by Victor Bongard)

The Copper Ridge Mining Company, formed in the early days of Ajo, and composed mainly of small stockholders was the original holder of these claims. There were 750,000 shares of this stock issued. Difficulties arose amongst the various stockholders and the Steele brothers, in order to be able to do something with the company, organized the Copper Ledge Mining Company. They obtained options on all the stock they were able to locate at ten cents a share and invited the Copper Ridge stockholders to join them in the new company. They now have approximately 700,000 shares of the Copper Ridge stock in escrow. Only three out of 135 stockholders in the Copper Ridge Company joined the Steeles in the new company and as a result the Steeles control more than 95% of the Copper Ledge Mining Co.

The group consists of 15 full claims and 2 fractions, 10 of which are patented. Some small production of shipping ore is reported to have come from small veins on the property. A 900 ft. churn drill hole was drilled on the Copper Ridge No. 4 but did not get through the fanglomerate.

The P.D. waste dump now extends to these claims and it is probable that P. D. would like to have the surface.

Claims on Which Walter Zitlau Would Control Negotiations

The following is a list of claims which Mr. Stewart discussed with Zitlau (see Stewart's letter of February 7, 1949).

<u>NAME</u>	<u>BOOK</u>	<u>PAGE</u>	<u>OWNER</u>
Independence # 1	UU	176	E. Zitlau
" # 2	UU	177	E. Zitlau
" # 3	UU	178	E. Zitlau

<u>NAME</u>	<u>BOOK</u>	<u>PAGE</u>	<u>OWNER</u>
Independence # 4	UU	179	E. Zitlau
" # 5	UU	180	E. Zitlau
" # 6	UU	181	E. Zitlau
" # 7	VV	155	E. Zitlau
Diamond Back # 1	HHH	136	E. Zitlau
" # 2	HHH	135	E. Zitlau
" # 3	HHH	137	E. Zitlau
" # 4	HHH	138	E. Zitlau
Speculator	GOG	205	E. Zitlau
J. C. Fraction	YYY	480	E. Zitlau
Pinnacle	UU	213	E. Zitlau
Iron Crown	UU	213	E. Zitlau
Iron Wood	WW	403	E. Zitlau
South West	HHH	134	C. A. Baker
Excelsior	HHH	133	C. A. Baker
Apex	JJJ	609	C. A. Baker
Rambler	JJJ	610	C. A. Baker
Cardigan	72	505	C. A. Baker
MaIachite	JJJ	611	C. A. Baker & E. Zitlau

For the above claims plus about 5 additional scattered claims W. A. Zitlau is asking \$60,000.00

Copper Sulphate	LLL	483	Baker, Price, & W.A. Zitlau
Last Chance	LLL	484	" " "
Eagle	LLL	485	" " "

For the above 3 claims Zitlau is asking 30,000.00

Bull Dog	Patented	Baker, Price, Zitlau
Triangles	Patented	" " "

For the above 2 patented claims, "B Group" Zitlau asking 75,000.00

Fracture	Mertz
Fracture No. 1	Mertz

The above two claims, shown on Ajo property map as Commonwealth # 1 and # 2, are owned by Mr. J. J. Mertz. In any negotiations Mr. Walter A. Zitlau is acting for Mr. Mertz; asking price 20,000.00

Total price on all claims listed above \$185,000.00

85 Group (from letter of Aug. 26, 1948 by Victor Bongard)

This group of 27 claims is held by Tom Alley and Bob Hodge of Ajo. Nine of these claims are in the Copper Rose Group and adjoin the Cardigan Group on the west. Nine are in the 85 Group and are located to the west of

the Copper Rose Group with open ground between, and nine are in the Lucky Bob Group to the south and apart from the 85 claims. Hodge said that John Westney of Philadelphia has only an oral agreement with he and Alley as to the sale of these claims and that he will receive a commission from them if he is able to turn the group. It is very possible that when Westney presented the 85 Group to the company that the group also included the Cardigan Group and that it was at the time that Alley was trustee of the combined Cardigan and 85 Groups.

Babbitt Group (from letter of Aug. 26, 1948 by Victor Bongard)

This group of twelve unpatented claims and one, the Mansion House, patented, all contiguous, was acquired by purchase and location, mostly during the early days of Ajo, by the Babbitt family. It is now held by the Babbitt estate. George Babbitt, Jr. controls the situation and other members of the family would be guided by him. Babbitt said that their expenses on the claims to date have been approximately \$40,000.00 and at first he said that he would be willing to get out with this amount and a small profit. When he was asked about a long term option he said that this would be satisfactory with him as long as we were active on the group. No substantial payments to be made during this preliminary period. We would keep the claims in good standing. He was rather vague when I asked him what he would expect as an overall price with such a four year option. He mentioned \$100,000.00 per claim but I believe that this was a figure that he grabbed out of the air and he would settle for much less if the \$40,000.00 was paid in cash after the end of four years, and the balance paid out of royalties. I also believe that he would be satisfied with much less in an all cash deal. He would be willing to ride along with an interest after his \$40,000.00 was returned. He also would like very much to retain the most easterly of his claims, the one sidelining the P. D. Silver Wing, for township purposes, and this might be used by us for bargaining purposes.

THEODORE A. DODGE
201 North Court Street
Tucson, Arizona
August 24, 1948

*copy from
ajo pen*
FILE 

Ajo, Arizona
Preliminary Impressions

Mr. Thomas G. Moore
Mining Department
The American Metal Co., Ltd.
61 Broadway
New York City 6

RECEIVED
SEP 15 1948
FOR FILING

Dear Tom:

I spent the 19th and 20th of this month at Ajo with Mr. Hope and Mr. Proctor of Consolidated Coppermines and Mr. Bongard, most of those days being devoted to talking to property owners with a little time spent in the field around the Cardigan and Firefly groups and around the 85 group north and west of Ajo Peak. The morning of the 21st I spent alone in the field outside the pit but along its southwest rim and along the south flank of Arkansas Mountain.

This was hardly enough time to give me much concrete idea of the district, but I shall jot down here some of my first impressions, leaving all discussion of claim ownership and possible deals to Mr. Bongard.

District as a Whole:

The bright, brick-red coloring of many big copper districts is lacking at Ajo. Everything is brown. Fresh surfaces around the south end of the pit show a purplish-red color, a color generally interpreted by Anaconda geologists as indicative of chalcocite at depth. On the weathered surface this changes to brown (rather than to brick red), and brown coloration is fairly widespread, diminishing somewhat perhaps as one goes west from Cardigan Camp. Sericitization is intense near the pit, but possibly it diminishes rapidly going west and south (this will have to be more carefully checked). Quartz and silicification are abundant all over the district in the intrusives and volcanics that I examined, and as far west as the 85 group in the Cardigan and Chico Shunie intrusives. Disseminated chalcopyrite seemed to be remarkably widespread, though in minute amounts, all over the 85 group.

Specularite in small amounts is widespread from the pit for several miles west, but I have no idea how much more there may be in the Arkansas Mountain-Cardigan area than

THEODORE A. DODGE

elsewhere, apart from Gilluly's observations (P.P. 209). Some of the specularite gets really into the rock like a primary mineral although it might be replacing an earlier primary mineral.

Alunite is present on Arkansas Mountain although Gilluly stresses the area east of the north end of the pit.

Shattering and sheeting of the volcanics is prevalent near the pit and southwest of Arkansas Mountain. I didn't notice so much in the Cardigan and Chico Shunie in the western part of the district. I didn't see the Cornelia quartz monzonite.

Methods of Study:

I think a great deal of useful information could be obtained with the aid of Gilluly's maps and sections and a brunton compass without going onto P-D ground. I enclose a quick sketch I made by pace and compass with the aid of those maps in a couple of hours spent on Knox's ground just southwest of the pit. A good deal of the geology of the pit might be plotted fairly accurately by brunton shots from various points outside P-D ground. General study of the whole area should be worthwhile also.

Accompanying Map:

The enclosed map was made up by shooting in several surface features of recent development from points near the stake said by Ellis Malone to be the northeast corner of Knox's Firefly group. I located this corner on Gilluly's maps by shooting on several known points, and then checked another point to the south on the edge of the new dump by shooting other points. This, coupled with the geology, the arroyos, etc. made my locations appear fairly close. To this sketch I added some of Gilluly's geology and coordinate numbers. If everything shown on this sketch except Arkansas Mountain is assumed to be at an elevation of about 1850 feet, the sketch is still fairly accurate, except, of course, that the contacts in the pit have been changed or obliterated by mining.

I have no claim data here except what little I remember from seeing Mr. Bongard's map, but I assume that the claim boundary I have shown on the sketch is approximately right for the southwest limit of P-D ground between coordinates 4 and 14. This can be checked easily. I have made this sketch map to fit Gilluly's geologic map on 1/6000 (plate 21) and his sections showing drill holes (plates 22 and 23).

THEODORE A. DODGE

Economic Possibilities:

Assuming that satisfactory arrangements can be made to tie up the necessary properties on a very long-term option, there are two interesting economic possibilities in the district:

1) Development of a sufficient tonnage of the downward extension of the New Cornelia ore body off P-D ground to warrant mining it underground, and 2) discovery of a new, unknown mass of ore elsewhere.

1) Extension of the New Cornelia Ore Body: Any discussion of this extension must be largely suppositional although more careful study of the field evidence available to us would be a help. Some suppositions worthy of consideration should be taken into account before trying to arrive at anything concrete. Among these might be listed the following:

A) The New Cornelia ore body seems to get smaller and deeper toward the south and southwest and to die out within P-D ground, yet peculiarly close to the claim lines. This might be explained as either

a) P-D got hold of only just exactly the amount of ground it needed to cover all of its ore body

or

b) Gilluly's report is incomplete; i.e. ore is known to go or thought to go into non-P-D ground, and information was withheld either by Gilluly or by P-D or both.

B) Tongues of quartz monzonite are shown as cutting volcanics (favorable cupolas) on those sections well within P-D ground east of Knox's Firefly group. Such tongues are not shown in the volcanics on the sections that go through or near Knox's ground. One can only suppose that they are there but that P-D didn't want it known.

C) One would suppose that anyone drilling a big, low-grade ore body would drill on each coordinate in both directions until at least one hole at each end was completely in waste or mostly in waste. Gilluly's sections, particularly those that go into foreign ground, show no such thing. Furthermore, some sections show geology well beyond the last hole shown. This is not because drilling would have had to be done on foreign ground; the indicated drilling stops long before that. There can be only one explanation, and that is that not all holes are shown, and if these missing holes were in waste, they probably would have been shown.

D) No section is shown on coordinate No. 3. This could be because there was no ore or geology of interest, but a more likely explanation is the presence of a foreign claim on the top of Arkansas Mountain (Bulldog?).

THEODORE A. DODGE

E) Plenty of holes are shown east of the pit and some south, but none southwest. Again claim ownership.

F) I could not find on Gilluly's map and sections the following holes: 86, 87, 88, 97, 98, 113, 124, 127, 130, 132, 136, 166, 169, 170, 171, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, and 194. Holes past 195 may be missing, and some of the A.holes may be missing, but I did not check these as I am not sure of the system in using these A numbers.

G) Gilluly describes a zone of chalcocite up to 150 feet thick, but averaging 40 feet, with abundant 3% to 4% copper, but averaging less, roughly parallel to the base of the fanglomerate along the south end of the New Cornelia ore body. This zone is supposed to lie from zero feet to 450 feet below the base of the fanglomerate although in most places it is said to be not over 200 feet below the fanglomerate. Between this chalcocite zone and the base of the fanglomerate is a zone of red rocks which contains islands of oxide copper minerals in those places where this oxide zone is fairly thick. In some places a barren zone overlies this zone of oxide copper. Quoting Gilluly: "The diamond-drill cores show that these relations persist to the greatest depths yet explored at the south end of the ore body, that is, at least to 200 feet below sea level."

The deepest hole shown on the sections as cutting this zone stops at 200 feet above sea level, and the next deepest is around 500 feet above sea level. On sections along the coordinates through the western part of the pit (N-S sections) the fanglomerate is indicated, but no holes are plotted in it.

It seems to me from all the above that it is more than a vague surmise that the oxide copper zone goes down into non-P-D ground, that the chalcocite zone goes down into non-P-D ground, and that the primary zone goes down into non-P-D ground in a rock mass consisting of cupolas of quartz monzonite cutting Concentrator volcanics. According to Gilluly large tonnages of commercial ore in the pit are found in the volcanics. What then could be a more favorable zone for ore than the cupola region?

It takes more of a surmise to understand why P-D did not take the ground south and west of the pit. The easiest explanation would be that they did not think there was sufficient commercial tonnage to make it worth the expense. On the basis of what I have written above, however, and in view of the way they are said to have picked up some much more crucial claims within the present pit area, I am inclined to think that they were unwilling to pay a stiff price for ground they thought would ultimately fall into their lap anyway.

THEODORE A. DODGE

It is obvious, of course, that without access to information unavailable to us, we cannot be sure of the chances of developing ore in commercial amounts outside of P-D ground on the New Cornelia ore body. It is still possible that P-D believes that there is very little of interest on their ore body outside their ground, but I believe that what evidence we have points the other way. Furthermore, even if there are indications of pinching out of the ore body downward, it could pick up again beyond the last holes drilled.

If the extent of the New Cornelia ore body is about what Gilluly shows, then there is little chance for commercial ore on non-P-D ground above sea level, but there still remains the chance of finding ore below sea level south of coordinate -G (Bluestone?). If, however, my surmises given above are correct, there appears to be a good chance of finding the downward extension of the New Cornelia ore body on Knox's Firefly group above sea level. Assuming that the top of the chalcocite zone is 200 feet below the base of the fanglomerate and that it continues westward to coordinate 4, one can plot where the top of this zone would fall on Gilluly's sections 4, 5, 6, 7, and 8. This would be as follows:

<u>Coordinate Number</u>	<u>Elevation of Supposed Top of Chalcocite Zone at North Boundary of Knox Firefly Group</u>
4	+1450' above sea level
5	+1430' " " "
6	+1400' " " "
7	+1400' " " "
8	+1300' " " "

The table above presupposes a lot of ore not shown on Gilluly's north-south sections. If Gilluly's ore limits are correct near the surface, but the ore continues down dip beyond what he shows on the sections, the table becomes:

4	-1600' below sea level
5	-1200' " " "
6	- 600' " " "
7	- 550' " " "
8	- 200' " " "

Gilluly's northeast-southwest section (plate 23), if continued 600 feet southwest, would cut the northeast corner of Knox's ground, and from the way he shows the ore on the section, there is no reason to believe that it does not continue downward to that corner where it would enter Knox's claims 300 feet above sea level, or 500 feet higher than Gilluly's north-south section along coordinate No. 8 would indicate (plate 22).

THEODORE A. DODGE

If one takes the most conservative view, there won't be any ore at any depth under Knox's ground. A less conservative view would be that there might be some ore around the depths shown in the second table. And it might be considered wishful thinking to believe that there is ore as shallow as shown in the first table. However, one cannot deny the possibility of there being ore at some depth above sea level under Knox's claims, and whether one wishes to take the chance and try to develop a commercial block of ground on these claims will depend on how much faith one wishes to put on the surmises and suppositions discussed above.

The surface geology, of course, with the north-westward-trending contact between the Cornelia intrusive and the volcanics, suggests that the ore, if it does extend downward under Knox's claims, would have to be at a depth closer to those shown in the second table than those shown in the first, particularly on coordinates 4, 5, and 6. However, examination of Gilluly's geologic section B-B on his 1/12000 map (plate 20) would make one think the ore zone might be much shallower. If this section is moved 750 feet west, it passes through the northeast corner of the Knox ground, and from the surface geology one would not think that this 750-foot shift should make much difference in the geology. If this supposition is correct, the zone of cupolas and possible ore should be encountered at Knox's corner at about 1300 feet above sea level, or 550 feet below surface.

My first impression of Knox's ground is that it is well worth a test by drilling provided it is felt that a deep extension of the New Cornelia ore body could be mined and provided a large group of claims in the area can be tied up satisfactorily.

The ground south of coordinate -G and east of coordinate 8 (Bluestone ?) may likewise have a southern and downward extension of the New Cornelia ore body, and what Gilluly shows on his sections would suggest that this is a better possibility than the downward extension into the Knox ground, but if Gilluly's dips are right, the ore would cross the south boundary of the P-D ground at over 500 feet below sea level, or 2300 feet below the surface. My observations on the dip of the fanglomerate on both sides of the pit check Gilluly's dip of 60°. Gilluly shows the dip of the contact between the gray ore and the overlying oxide zone as about the same. I checked this with a Brunton dip near hole 165 on cross-section 17 taken from across the pit at Knox's corner. Looking at this contact from the north end of the pit Mr. Hope expressed the opinion that the dip is around 20°, but I believe it is closer to 60° from all I have seen. It seems to me, therefore, that the ore zone, if it exists south of the P-D south line east of coordinate 8, will lie at 500

THEODORE A. DODGE

feet or more below sea level unless there is a flattening in the fanglomerate contact downward, a flattening Gilluly does not show on his sections. From the very nature of the fanglomerate, such a flattening would be nothing unusual, and I understand that two holes drilled on the Bluestone in this area cut monzonite at depths above sea level. This is perfectly possible, but it would imply fudging of the information shown in hole 181 on section 16.

It would be difficult to check the drill information on the Bluestone. Even though the cores could be examined, there would be no positive proof that the location of hole or the depth of sample were correct.

My first impression of this ground to the south (Bluestone ?) is that there is an excellent chance for ore here, but I think most of the evidence points to its lying over 2000 feet below the surface.

One geologic consideration of great interest in connection with possible downward extension of the New Cornelia ore body is the distribution of specularite shown by Gilluly. It appears to be in a belt just north of the fanglomerate contact and parallel to that contact, and furthermore it lies over the south part of the known ore body and beyond the indicated ore body in both directions. Gilluly objects to the obvious assumption that the specularite is related to the zone of weathering at the base of the fanglomerate and cites evidence to support the contention that the specularite is primary. His proofs are not positive, however, and it is possible to maintain with considerable weight of evidence that there is some relationship between the specularite and the base of the fanglomerate. Gilluly's study of the distribution of minerals is limited to the pit except for specularite (witness his map of sericitized plagioclase, which he shows only in the pit but which is abundant on the southwest slope of Arkansas Mountain). It is possible to assume that magnetite is a primary mineral indicative of ore. Gilluly did not map it outside the pit because he did not map any minerals outside the pit except specularite. According to Lindgren magnetite may alter to hematite under conditions as yet in some doubt. If one puts Gilluly's magnetite and specularite maps together, one might reach the conclusion that the only magnetite left to be observed in the pit was away from the fanglomerate contact where it had not changed to specularite and that mineralization of interest extends southwest of the pit. This might be checked to a certain extent by search for magnetite west of the pit but well north of the fanglomerate contact. Whatever the explanation of the distribution of the specularite, and whether it be primary or secondary, its distribution is highly provocative viewed in relation to possible mineralization southwest of the pit.

THEODORE A. DODGE

If one could tie up satisfactorily all the claims along the south and southwest margin of the P-D ground, including the claims on Arkansas Mountain (Bulldog?), and if one were indifferent to making good friends of P-D, I think one would have an excellent chance of developing a big tonnage of commercial ore. How much the depth and hardness of rock would affect the commercial possibilities I am not competent to judge.

2) Possible Discovery of New Ore Bodies: It is fairly obvious at first glance that new ore bodies might be discovered southwest of Arkansas Mountain. The favorable volcanics are there, and they may be shot full at depth with Cornelia quartz monzonite. A study of rock alteration might be a guide here although it could hardly be conclusive. If sericitization is confined to an aureole around the pit, which it may be, that would be one unfavorable indication. The value of a study of the distribution of specularite is anybody's guess. Specularite is at best a mystery. However, if a relationship between specularite and the New Cornelia ore body can be proved, and if specularite is particularly abundant in certain other areas but not elsewhere, it should serve as an indication. My only fear is that it is pretty widely distributed. I was not impressed with the area north and west of Ajo Peak (85 group) as a locus for ore bodies, yet I was impressed with the wide distribution of small amounts of chalcopyrite in this area. Specularite might follow the same pattern and merely indicate that one is in the right district.

From my very limited field work in the district I got the impression that silicification and quartz are very widely spread, so they might not serve as a guide to metallic mineralization. The same can be said of pegmatites. Albite and alunite might serve as useful keys. Gilluly found nothing useful in the study of fractures, but there might be other structural features that would tell something.

The area west and southwest of Arkansas Mountain appears at first glance more favorable than any other, but this does not eliminate all others, nor can one be sure that a careful study of rock alteration and mineral distribution would necessarily prove or disprove the area. The existence of the New Cornelia ore body and the presence of the roof rock of that ore body in this area to the southwest make the area a very good bet as compared to many things that are drilled these days in the hope of finding a porphyry copper.

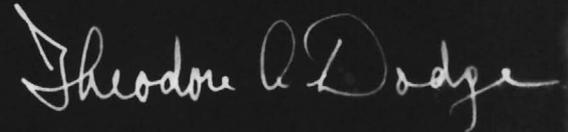
THEODORE A. DODGE

Conclusions:

To conclude this hasty report based on very insufficient observations, I should say that if a satisfactory, long-term option can be obtained on enough ground south and west of the New Cornelia pit, this ground appears to warrant further geological study and some drilling.

cc.- Mr. Stewart
Mr. Bongard

Sincerely yours,

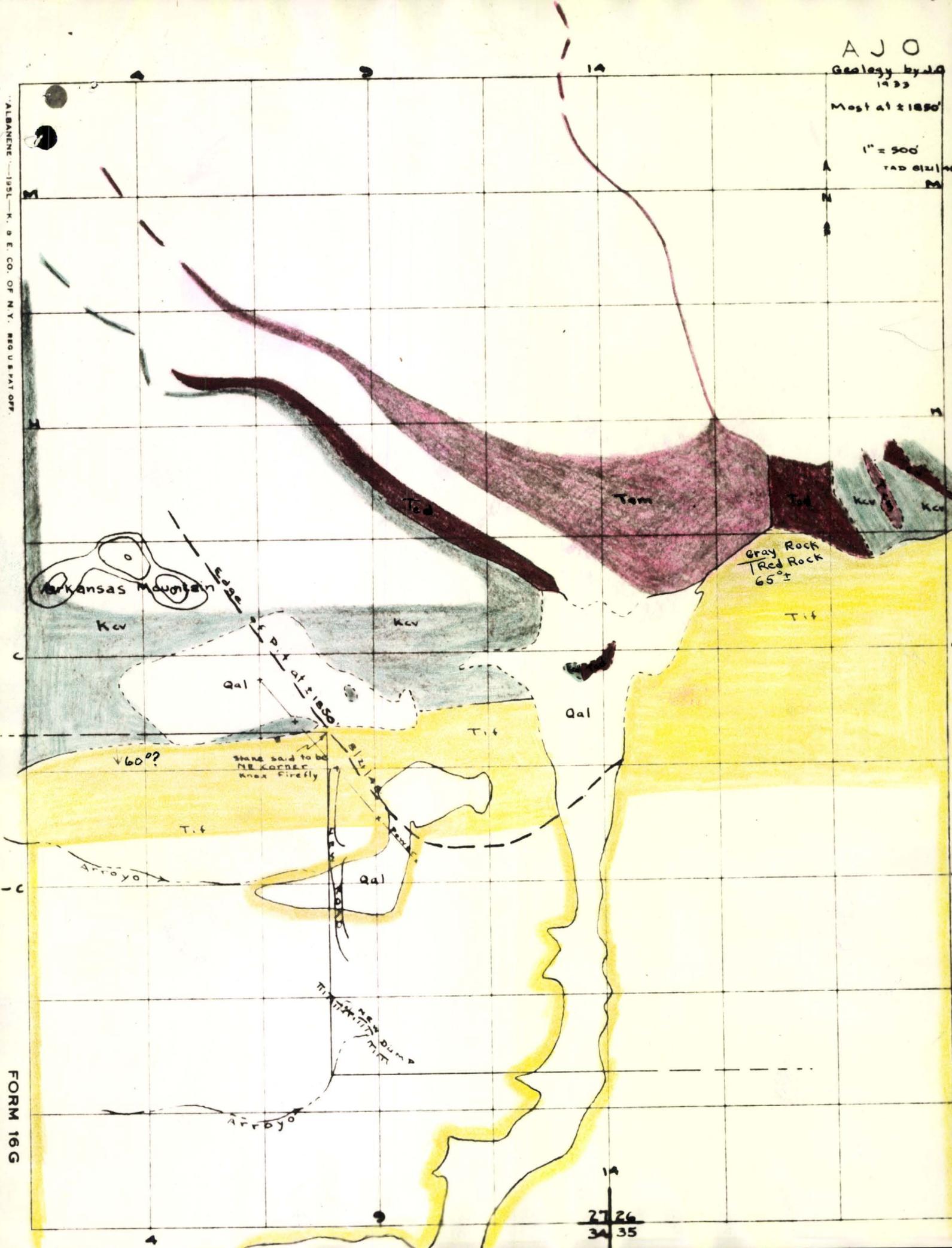


Theodore A. Dodge

AJO
Geology by J.A.
1933
Most at ± 1850'

1" = 500'
TAD 0121/40
PA

ALBANY — 1931 — K. & E. CO. OF N. Y. REG. U.S. PAT. OFF.



FORM 16G

6316 West Van Buren

7 AM

936-1326

EASON



Oil Company

5225 NORTH SHARTEL • P. O. BOX 18755 • OKLAHOMA CITY 73118

CONRAD S. PRESTON
VICE PRESIDENT

March 14, 1969



Mr. Edwin N. Pennebaker
Box 817
Scottsdale, Arizona 85252

Dear Mr. Pennebaker:

I called Jim Sharp, after our telephone conversation, to confirm Friday, March 21 as a time he could take you to the Ajo properties. Jim's phone numbers in Phoenix are: office - 936-3348 and residence - 265-7730. He requested when you heard from me to give him a ring so final arrangements for the trip could be made. LD

The two plats enclosed with this letter are self-explanatory. One being the general location of the Ajo operations in Arizona and the other outlining the block of claims we're discussing with Mr. Sharp.

From a one-day trip, you may be able, on the basis of surface exposures, to make some sort of an estimate of the extent of grade rock from the Ajo mine. Of course we would expect to have to do some core drilling to determine the depth of reasonable grade ore. What we primarily want you to do, upon visual examination of the surface, is to give us your opinion whether we should attempt to negotiate an option with Mr. Sharp, in order to explore more thoroughly the value of the properties. Additionally, we would like to have a rough estimate of the amount of preliminary work you believe would be necessary to evaluate the claims up to the point of a full fledged core operation to block out reserves.

We are not dying to get into the copper business but the surface rocks looked interesting enough to me to get management approval to carry on, at least, a short evaluation by a qualified mining geologist.

Yours very truly,

EASON OIL COMPANY

Conrad S. Preston
Conrad S. Preston

CSP
Enclosures

• RETURN IN 5 DAYS TO

EASON OIL COMPANY

P. O. BOX 18755

OKLAHOMA CITY, OKLA. 73118

VIA AIR MAIL

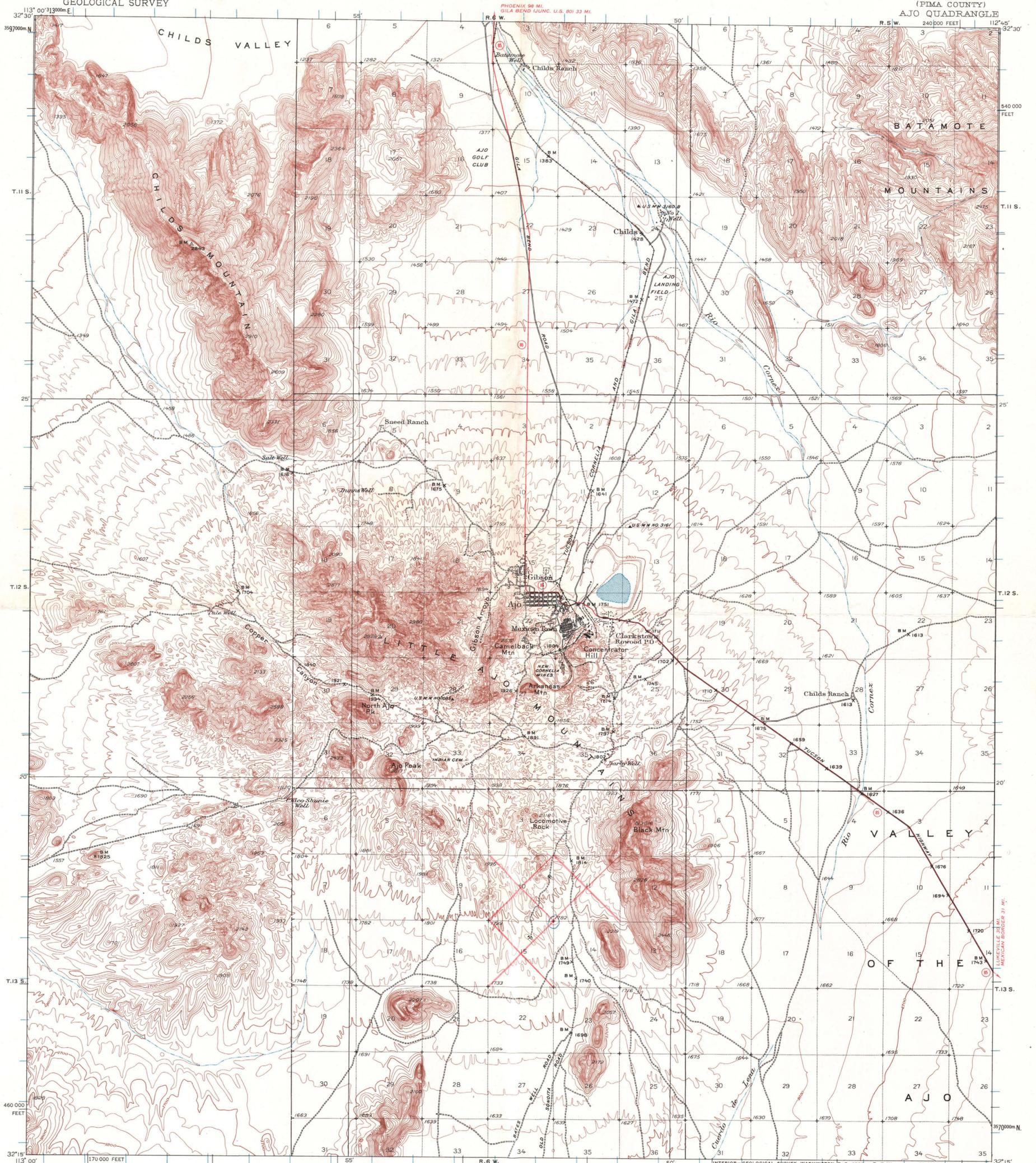
Mr. Edwin N. Pennebaker

Box 817

Scottsdale, Arizona 85252

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

ARIZONA
(PIMA COUNTY)
AJO QUADRANGLE



Topography by W.G. Carson and D.H. Rurlidge
Surveyed in 1930-1932

ROAD CLASSIFICATION
Heavy-duty —————
Light-duty —————
Unimproved dirt - - - - -
State Route ○

APPROXIMATE MEAN
MAGNETIC DECLINATION, 1932

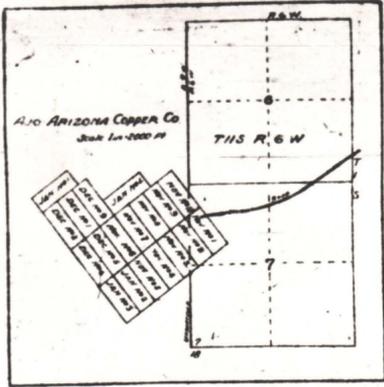
SCALE 1:62500
0 1 2 3 4 MILES
0 3000 6000 9000 12000 15000 18000 21000 FEET
0 1 2 3 4 5 KILOMETERS
CONTOUR INTERVAL 25 FEET
DATUM IS MEAN SEA LEVEL

(Readjustment indicates that elevations on this map should be decreased 1 foot.)

FOR SALE BY U. S. GEOLOGICAL SURVEY, DENVER 2, COLORADO OR WASHINGTON 25, D. C.
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

Polyconic projection. To place on 1927 North American datum
move projection lines 110 feet west
10,000-foot grid based on Arizona (Central)
rectangular coordinate system
1000-meter Universal Transverse Mercator grid ticks,
zone 12, shown in blue

AJO, ARIZ.
N 3215-W1245/15
1932

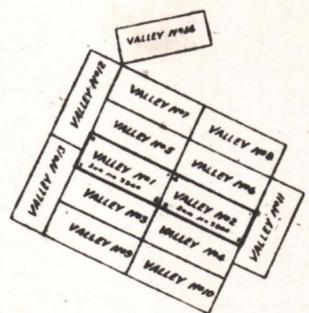
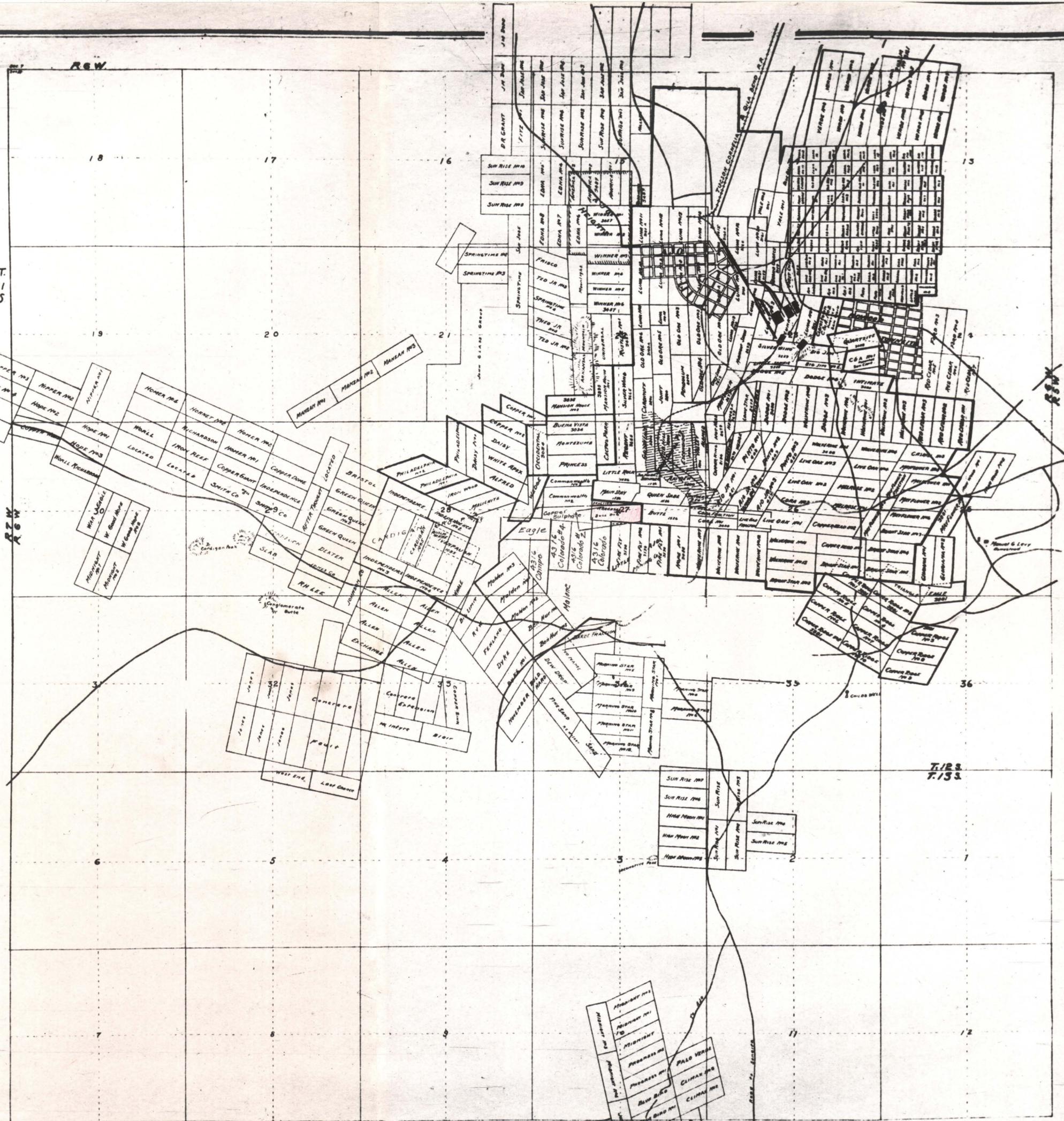


**MAP OF
AJO MINING DISTRICT
PIMA COUNTY, ARIZ.**
Compiled from Official Records
and other Sources
By T.N. Stevens - U.S. Mineral Surveyor
Tucson, Arizona.

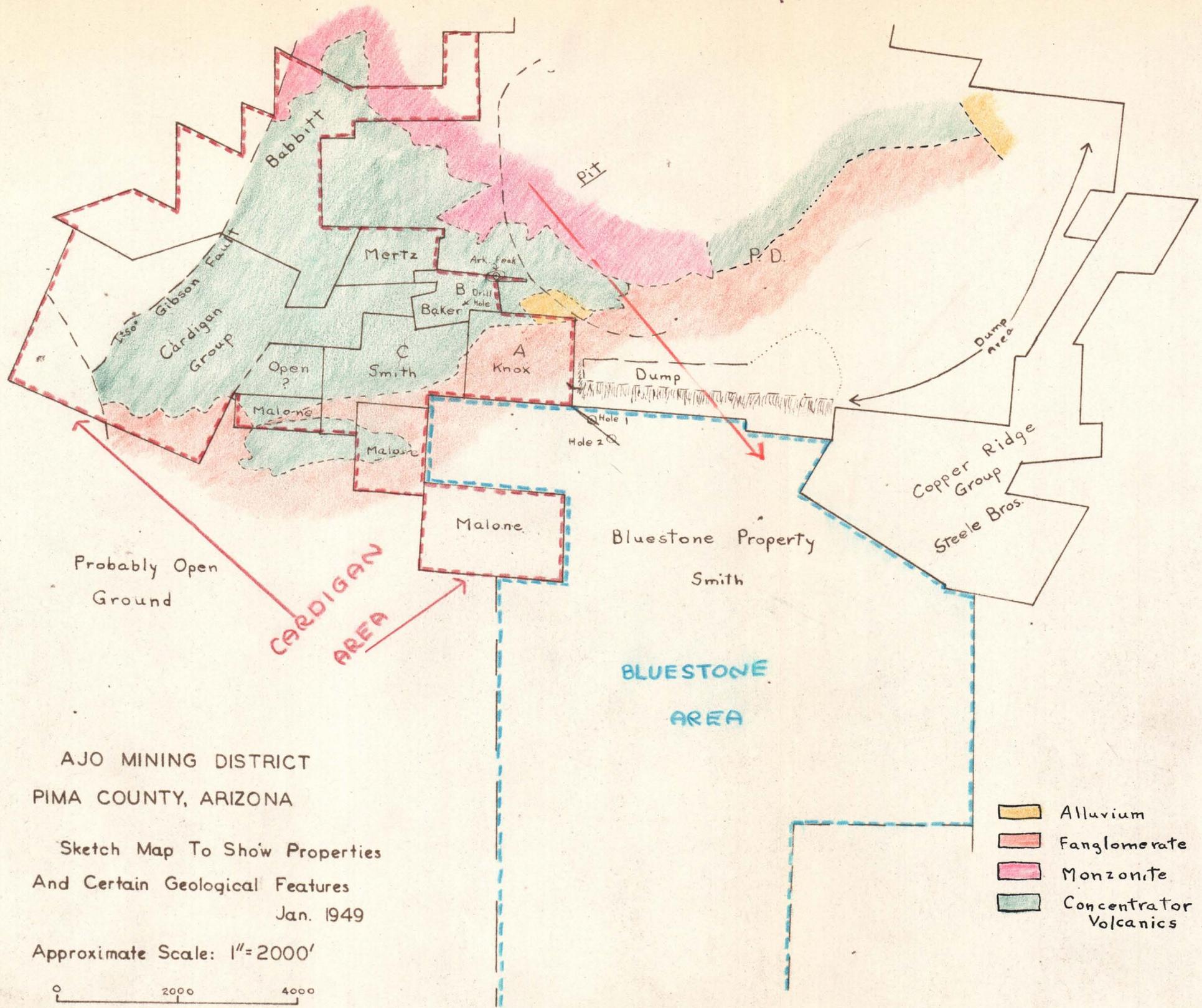
Scale 1 in = 1000 Ft.



UN SURVEYED



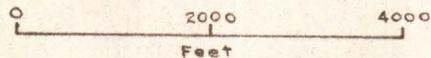
Representing the first map of the Ajo Mining District...
The scale of this map is 1:2500



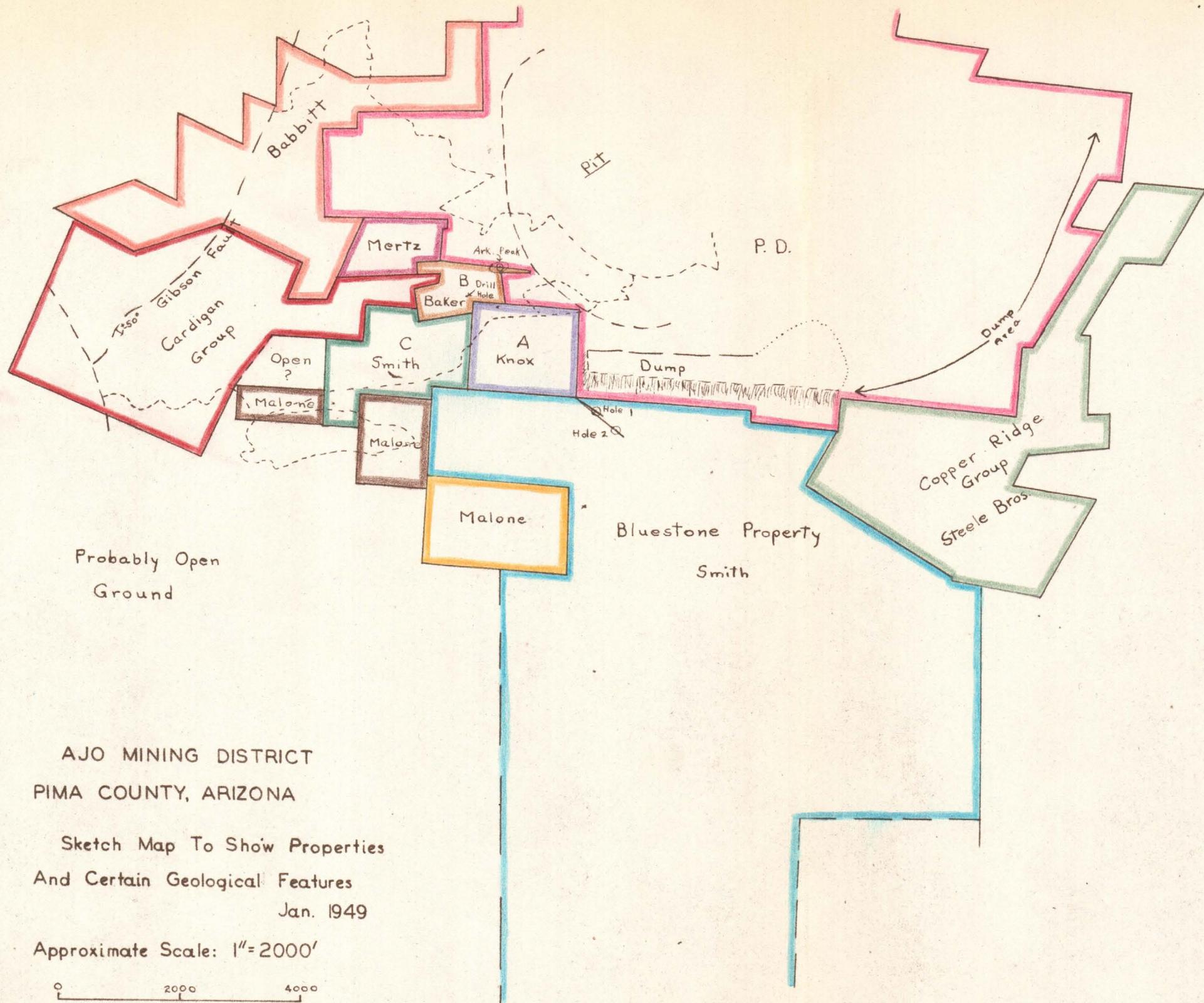
AJO MINING DISTRICT
PIMA COUNTY, ARIZONA

Sketch Map To Show Properties
And Certain Geological Features
Jan. 1949

Approximate Scale: 1"=2000'



- Alluvium
- Fanglomerate
- Monzonite
- Concentrator
Volcanics



AJO MINING DISTRICT
PIMA COUNTY, ARIZONA

Sketch Map To Show Properties
And Certain Geological Features
Jan. 1949

Approximate Scale: 1" = 2000'

