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UNIVERSITY OF ARIZONA
ARIZONA BUREAU OF MINES
ORE TESTING SERVICE

April 12, 1955

Mr. Harold Ferrion
Pinal Copper and Uranium Corporation
4318 N. Central Ave.
Phoenix, Arizona

Dear Mr. Ferrion:

Ore No. 1455

The sample of copper ore from Pinal county assayed 1.96 copper. The copper was mostly chrysocolla in a porphyritic gangue.

A sample was crushed by rolls set at 3/8 inch opening and the crushed product leached with sulphuric acid in a glass cylinder about 18 inches in depth. The leaching time was 6 days and washing one day. The results are given in the following table:

Products	Tons per 100 tons heads	Percent sulphuric acid	Percent Copper	Distribution percent copper
Heads	100.0		2.01*	100.0
First leach solution	33.0	0.57	1.96	32.3
2nd leach solution	29.2	0.49	1.46	21.4
3rd leach solution	43.0	1.29	0.70	15.0
4th leach solution	35.6	1.52	0.49	8.7
Wash Nos. 1 & 2	54.0	0.21	0.12	3.2
Wash No. 3	24.0	0.04	0.05	0.6
Tailing	96.8	-	0.39	18.8

* Calculated from products

The copper dissolved and recovered in solutions and washes amounted to 81.2 percent of the total copper. The tailing assayed 0.39 percent copper.

The acid consumption was 70.5 pounds per ton of ore. The first acid added to leach was 5 percent and three later strengths 2.5 percent sulphuric acid.

METALLURGICAL RESULTS OBTAINED ABOVE SHOULD BE CONSIDERED AS ONLY APPLICABLE TO MATERIAL CONFORMING TO THE CHARACTER OF THE SAMPLE UPON WHICH THE TESTS WERE MADE.

A large scale test should be conducted on the ore before a leaching plant is considered to determine the effect of depth of tanks to be used and fouling of solutions when returned to system. One large operation went from laboratory to one ton pilot plant and then to 50 tons before final construction of the large 5,000 ton plant.

Yours very truly,

G. H. Roseveare
Metallurgist

*

METALLURGICAL RESULTS OBTAINED ABOVE SHOULD BE CONSIDERED AS ONLY APPLICABLE TO MATERIAL CONFORMING TO THE CHARACTER OF THE SAMPLE UPON WHICH THE TESTS WERE MADE.

Mr. Harold Ferrin
744 North 56th Street
Mesa, AZ 85205

985-1760

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December 12, 1973

LETTER of CERTIFICATION

I, Richard E. Mierits, of 1634 W. Hazelwood Street, #2, Phoenix, Maricopa County, Arizona, does hereby certify that:

(1) I am a mining engineer, graduated from the University of Wisconsin with the degree of Bachelor of Science in 1939.

(2) I have practised my profession continuously since then, receiving my Arizona State Registration as a Mining Engineer in 1956 and my Arizona State Registration as a Geologist in 1970, being a member in good standing.

(3) The report to which this letter is attached and part of, has been prepared on the basis of personal observations on and of the property on December 7, 1973, on the writers general geologic knowledge of the area and on the review and study of available factual data of others.

(4) I have no direct nor indirect interest in the property.

(5) I have no direct nor indirect interest, nor do I expect to receive any interest, direct or indirect in the properties or the securities of Cutlass Exploration Ltd., Vancouver, B. C., Canada. or its affiliates.

Respectfully submitted,

R. E. Mierits,
Mining Consultant
Phoenix, Arizona.

(AC. 602, 277-6053)

A

GEOLOGICAL EVALUATION

and

EXPLORATION

REPORT

on the

FINAL COPPER PROPERTY

Papago Indian Reservation

in

Pinal County, Arizona

by

Richard E. Mierits
Mining Consultant
Phoenix, Arizona

December 12, 1973

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INCLUDED MAPS

Map No. 1 - REGIONAL GEOLOGY & INDEX MAP, Portion of Pinal County, Arizona.
Map No. 2 - CLAIM MAP, Pinal Copper Corp. Property.
Map No. 3 - ALTERATION and MINERALIZATION, Pinal Copper Corp., Geology by T. W. Mitchum, Geologist, Tucson, Arizona.
Map No. 4 - GEOLOGIC MAP, Pinal Copper Corp., Geology by C. E. Cronenwett, Geologist, Tucson, Arizona.

INTRODUCTION:

The writer examined the Pinal Copper property on December 7, 1973, accompanied by Mr. Harold Ferrin, stockholder and agent for Pinal Copper Corporation, an Arizona corporation, owner of said property.

The field work, as well as the preparation of this report, was requested by Cutlass Exploration Ltd., Vancouver, B. C., Canada and authorized by Mr. Steve Radvak, also of Vancouver and spokesman for the Company.

The basis and preparation of this report includes the writers geologic knowledge of the general area of the property, the writers personal visitation and examination of the property, a review and study of factual data provided by the "Company" as well as from other sources and the writers personal experience with regard copper mineralization in Arizona. Factual data in hand included claim maps, geologic maps, reports by other mining engineers, etc. All has been considered in the preparation of this report.

PROPERTY, LOCATION and ACCESSIBILITY:

The property consists of 62 unpatented lode mining claims, held by right of location within the Papago Indian Reservation in the southwestern corner of Pinal County, Arizona. (See Map No. 1). The claims are recognized by the Reservation, taxes are paid and the claims appear to be in good legal standing. All claims are transit surveyed and well marked on the ground. The names of the claims are as follows:

Big Ike No. 1	Copper Bell No. 10	Copper Flat
Big Ike No. 2	Good Copper	Copper King No.1
Kick Back No. 1	Good Copper No. 1	Copper King No.2
Kick Back No. 2	Pinal Copper & Uranium Ext No 1	Good Gold
Kick Back No. 3	Pinal Copper & Uranium Ext. No. 2	Gold Bell
Kick Back No. 4	Pinal Copper & Uranium Ext. No. 3	West Side
Kick Back No. 5	Pinal Copper & Uranium Ext. No. 4	West End No. 1
Kick Back No. 6	Pinal Copper & Uranium Ext. No. 5	West End No. 2
Kick Back No. 10	Pinal Copper & Uranium Ext. No. 6	West End No. 3
Kick Back No. 11	Pinal Copper & Uranium Ext. No. 7	West End No. 4
Kick Back No. 12	Golden Hill South No. 5	West End No. 5
Kick Back No. 13	Copper Hill No. 4	Ship Rock No. 1
Copper Bell No. 1	Copper Hill Ext. No. 1	Ship Rock No. 2
Copper Bell No. 2	Copper Hill Ext. No. 2	Ship Rock No. 3
Copper Bell No. 3	Copper Hill Ext. No. 3	South Copper No. 1
Copper Bell No. 4	Copper Hill Ext. No. 4	South Copper No. 3
Copper Bell No. 5	Copper Hill Ext. No. 5	South Copper No. 4
Copper Bell No. 6	Copper Hill Ext. No. 7	South Side No. 2
Copper Bell No. 7	Copper Hill Ext. No. 8	North Copper No. 4
Copper Bell No. 8	Copper Hill Ext. No. 9	North Copper No. 5
Copper Bell No. 9	Copper Hill Ext. No. 10	

These lode claims cover parts of Sections 28, 29, 30, 31, 32 and 33 of T. 10 S., R. 2 E. of the G. & S. R. B. & M., Pinal County, Arizona. The south boundary of Pinal County in this area is the township line between T. 10 S. and T. 11 S., the west boundary of Pinal County in this area is

the range line between R. 1 E. and R. 2 E. Pima County is South and Maricopa County is west of the two referred to boundaries of Pinal County. (See Map No. 1).

The property is approximately 43 miles by road southwest of Casa Grande, a small city located on the Southern Pacific railroad system. Travel to the property can be completed by automobile from Casa Grande (railroad crossing) by travelling south and west 26.4 miles on paved route 86 to a dirt-gravel road junction on the west or right. (marked Kohatk). After 5.3 miles travel on this Reservation maintained gravel road, the road "Y" junctions on the south or left side of the road. Travel 7.0 miles on the left arm of the "Y" to a second "Y", the left arm being the access road to the property and the right arm leading to Chiapuk, an Indian town or settlement. Travelling on the left (south) arm of the "Y" for 3.0 miles one crosses the airstrip and the old mining camp (now only a water tank remains) is another 1.1 miles; the old "water well", a point of reference, is 0.4 miles beyond the old camp.

FACILITIES:

No gas or electricity facilities are on or near the property. The old water well is caved or bridged over and could be cleaned and new casing set to make it usable or one of the various diamond drill holes might be used to supply water for a drilling program.

The property does not have any facilities for housing of drilling personnel but there are ample areas for the placement of mobile homes or house trailers.

HISTORY, DEVELOPMENT and PRODUCTION:

Part of the present property dates back to the 1890s when the area was located and prospected for gold. Like many other mining properties, it changed hands several times when in 1917 the property, then 10 claims, was purchased by Mr. Henshaw. Pinal Copper and Uranium Co., now Pinal Copper Corp., acquired the property in 1954. For many years it was in litigation and finally resolved in year 1972.

Early development of the property included the sinking of two shafts - the Pinal Shaft, 688 feet at -50° and the Greenback Shaft, 100 feet at -40°, the latter being about 2000 feet east of the former. East-west levels were driven on the 50 foot, 150 foot, 300 foot and 500 foot depths aggragating about 700 feet in the Pinal Shaft. East-west levels were drifted on the 50 foot and 100 foot depths, aggragating 380 feet in the Greenback Shaft. Shallow shafts, pits and small trenches comprise the balance of early development.

Subsequent development by the present owners included diamond drilling 35 shallow holes and one deep hole. Miami Copper Co. had churn drilled 5 holes (700 to 800) feet in depth. Transarizona Resources diamond drilled one hole and ElPaso Natural Gas Co. drilled one diamond drill hole.

No production of record has originated from this property, although one

carload (40 tons?) of oxide copper ore from a surface pit near the old water well assayed 2.89% copper.

GENERAL GEOLOGY - MINERALIZATION:

In general, the regional geology is relatively simple and includes large masses or areas of basalt flows, Tertiary andesitic and rhyolitic intrusions, a Laramide intrusive granite and related crystalline rocks, some Cretaceous andesitic rocks, very sparse Carboniferous-Devonian sediments and the basal rocks, PreCambrian granite and schist.

As indicated on Map No. 1 - Regional Geology & Index Map - the claimed area hosts the Tertiary intrusives which are in contact with the Pre-Cambrian schist. The claimed area approximates 3 square miles of surface and within this perimeter there is much local, intricate and detailed geology which would be impossible for the writer to map, - even observe in a short period of time. For this reason, the writer wishes to include geological maps of others and to quote the writings of J. B. Tenney, Geological Reconnaissance of the Casa Grande Mining District, Arizona, Arizona Bureau of Mines, G. M. Butler, Director, 1933 and Mr. Charles H. Dunning, Mining Engineer, Phoenix, Arizona, whose report of January 9, 1956 was completed for Pinal Copper and Uranium Corp.

General Geology - Arizona Bureau of Mines Report

"The basal complex on which the lava rests at the Greenback mine consists of a series of large intrusive masses of porphyry varing in composition from diorite to quartz monzonite. These igneous rocks have been intruded into PreCambrian schist, small remant outcrops of which are found west of the Pinal shaft. Resting on a partially planed surface of these basal rocks is a thick series of basic lava flows and volcanic breccias, which have been tilted at slight angles to the northeast. The range is a typical basin-range ridge, much modified by erosion into a series of low rugged hills. The basal complex underlying the lava has been exposed by erosion in the piedmont slopes of the hills".

General Geology - Charles H. Dunning

"The terrain consists of a basement of Pinal Schist which has been invaded by magmas solidfying as various phases of granitic porphyry, quartz monzonite porphyry, and dioritic porphyry.
The geology at the site was quite thoroughly studied and reported upon in 1920 by Dr. G. M. Butler of the University of Arizona. There has been no cause for any change in opinions since that time, and as this is an economic, rather than a technical report, may it suffice to say that I fully agree with Dr. Butler."

Mineralization - Arizona Bureau of Mines Report

"The mineralization is all pre-lava and was probably closely related to the porphyritic intrusives. Two types of mineralization are found. In the first type the magma after solidification and partial shattering, was invaded by solutions containing potash, alumina and sparse silica, together with salts of copper. The fractures were filled with veinlets of sericite and metallic sulphides and the fragments between fractures were partly impregnated. Subsequent oxidation has left a limonite-stained,

Kaolinized slightly copper-stained mass containing veinlets of chrysocolla. It was an outcrop of this type at the camp site that first attracted prospectors and on which the first locations were made.

In the second type of mineralization, which probably followed the first type, the porphyry was invaded along a major fault N. 70° W. zone, by intensely siliceous solutions carrying a little copper and iron sulphides and a small amount of erratically distributed gold. This type of mineralization has been left as a network of quartz veins which strike northwest in a zone of intensely brecciated porphyry. Parts of the veins are somewhat stained with limonite, a little green copper carbonate and silicate, and sporadic pockets rich in free gold occur. The total length of the zone is about 3000 feet and the width varies between 50 and 200 feet. The general dip of the zone is about 60° to the south and the thickness of individual veins varies from a foot to over 50 feet. A last phase of this type mineralization was the filling of post quartz fracture with calcite associated with minor amounts of iron and manganese salts. It is on the veins of the second type mineralization that the Greenback and Pinal shafts were sunk on outcrops rich in gold. In the work done on both outcrops, the gold-rich pockets in the veins proved small. There is a possibility that they may be the tops of definite shoots, but insufficient work has been done to demonstrate this. The bottom of the ore in the Pinal shaft was reached at 50 feet and no further pockets or shoots were encountered. At the Greenback shaft the bottom of the ore was at about 35 feet. At 50 feet the character of vein filling changed, and the vein was probably cut off by a fault. The 100-foot level drifting was driven entirely in country rock cut by numerous calcite veins dipping at various angles.

At the Pinal shaft the vein dips about 50° to the south and was continuous to the bottom of the shaft with an average thickness of about six feet. At the water-level about 520 feet below the outcrop, occasional grains of rusty pyrite occur in the quartz and on the walls of the vein, and assays have shown the pyrite to be frequently gold bearing. Equally high samples have been obtained from limonite-stained portions of the vein on the 150 and 300-foot levels. The outcrop at the surface on which the shaft was started was more heavily stained with limonite than elsewhere. This condition was also true at the rich outcrop at the Greenback shaft. The vein filling is very dense quartz almost void of vugs or fractures. It is highly improbable that sufficient ground water movement has existed in the past to have allowed for transportation and subsequent enrichment of the gold.

Between the Pinal and Greenback shafts are many vein outcrops, in the network of veins, more heavily limonite-stained than the two portions of the vein system prospected at depth."

<u>Mineralization - Charles H. Dunning.</u>
<u>Central Situation</u>
"The central area may not prove in the long run to be "central" but is so designated at the present time. It was a natural starter for exploration because there were outcroppings of commercial ore, a water well that had drilled through ore, and an intriguing geological situation generally. Dr. Butler reports that the water well passed through 290 feet of low

grade ore. From one open cut a test carload was shipped to smelter some years ago and assayed 2.89% copper. Copy of this smelter return is on file.

Most of your present 27 drill holes have been put down in this area.

In this area the rock consits of the various phases of porphyry mentioned above and also contains some silicified zones of dykes which are sparsely mineralized.

The general course of mineralization is from the southeast to the northwest. It is bounded on the east by a major fault, on the north by valley fill, on the west gravelly fill, and on the south it contacts the schist, which constitutes a situation in itself. The total area of this Central Situation is approximately 500,000 sq. ft.

In the softer portions of this area there is generally no copper showing in the outcrop, but one need dig a few inches before copper is encountered. Angle drilling has shown: good copper in the softer areas, special enrichment along the contacts with the harder zones, very low grade copper in the hard zones themselves.

These conditions lead one to believe that the entire area was originally one of moderate or low grade content, much like the hard zones. The softer zones have been amenable to leaching and such leached copper has precipitated and enriched such soft zones for some vertical distance immediately below surface. The hard zones have been comparitively unleached but have acted as dams against percolating solutions causing extra enrichment along their walls.

Southeast Situation:
This area, prospected by Hole #22 seems to comprise the extension of a mineralized condition spurring off from the Central Area. A general sample of Hole #22 assayed 2.00% copper. Drilling proof that there was continuity between the Central Area and this situation would add large tonnage to "assured ore", and economic features to an open pit.

South Situation:
In the general area designated as the "South Situation" geological conditions are quite different. Here the mineralization is in schist. Bands of the schist that are normal, and predominate, shown intense leaching, wtih traces of copper remaining. Oxidized iron minerals are of the type that once contained copper. Siliceous lenses that are normal to such a schist, are unleached but show copper approaching commercial grade.

Schists of this type, when invaded by copper bearing intrusions are often more receptive to replacement by copper than monzonitic type rocks, thus forming higher grade ores. This highly mineralized and leached schist area could easily form rich secondary, and commercial primary, ore zones. It has good possibilities of developing into the best producer of any area you have. It should be explored by preliminary drilling.

Near West Situation:
Proceeding west from the Central Area the terrain is mostly covered with

alluvium, except for some croppings in washes (such as situation 30 - q.v.). But at a distance of about ½ mile an area of highly kaolinized monzonite or rhyolite outcrops. There are a few ten foot prospect holes showing a little copper.

Kaolinization is an alteration of the constituents of rhyolitic type rocks caused by chemically charged solutions. Such conditions portend mineralization when they occur where economic minerals are indicated in the altering solutions. Such situations are also prone to subsequent leaching.

Such an area of kaolinization, with a bit of copper remaining, in a general area of copper mineralization, certainly justifys exploration by drilling. Here there could well be a secondary zone of the chalcocite type.

Far West Situation:
This area, from a mile to a mile and a half west of the Central area again shows a highly mineralized condition. It cannot be defined, mapped nor tied in geologically until there is a survey with ground markers. To the south it seems to tie into unmineralized schist; to the west it is covered with later volcanic flows. But generally speaking there is a lot of good looking country there that warrants exploration.

Northeast Situation:
Immediately northeast of your Central Area there seems to be a band or zone of comparitively unmineralized rock. Further northeast drill holes 16 and 18 were put down and penetrated soft, leached low copper bearing material. This area looks doubtful but justifies a bit of further exploration.

Situation "30":
For lack of a better name I have called this area "30" because assay samples taken there happened to be numbered 30, 31 and 32. Here we have a hard silicified zone cropping across a gulch. No copper was apparent but a pecular shade of some of the red "iron" led me to suspect red copper oxide. An average sample assayed .90% copper. Sample #31 was taken of a different type of porphyritic material on the hanging wall side of the silicified zone. It was leached and showed no visible copper but assayed .30%. Sample #32 was taken of the same hard silicified band as sample 30, where it outcrops through the gravel fill about 100 yards southeast from #30. It assayed 1.20% copper.

This general area warrants exploratory drilling. Like the South Situation, the values in the hard rib, and slight remaining values in its soft neighbor indicates important secondary values at reasonable depth in the leachable material.

Tonnage and Averages:
Twenty seven diamond drill holes have been put down but they have not been systematically spaced nor have the cores or sludges been consistently assayed.

At the time of my examination in May 1955, I sampled the cores from holes 3, 5, 8, & 14. These were selected as being fairly representative of the

general area covered by the then 15 holes. Assays were as follows:

Hole #3	1.40%
Hole #5	3.30%
Hole #8	3.40%
Hole #14	1.50%

More recently I have sampled the cores from other holes with results as follows:

#3 upper portion	3.00%
#14 middle portion	1.50%
#20 from 25' to 45'	2.80%
#22 general	2.00%
#23 general	1.40%
#26 general	1.60%
#27 general	.50%

This last lot of assays, represented by the attached certificate, were selected for the following purposes:

(a) to check or train the eye in estimating other holes or cores.
(b) To supply a diversified set of standards so that quick colormetric assays can be made at the mine.
(c) to obtain definite and positive results in at least a few holes and in some unknown situations (the 30s).

The average of all of the above assays is about 2.00% copper. Judgement indicates that the average of all the holes, or of the area covered by the holes would be somewhat leass - probably 1.40% to 1.60%. And in considering this area or tonnage a further allowance must be made for the very low grade hard ribs mentioned above, although they may not have to be mined.

The general area covered by the holes, without including some outlying holes, is approximately 640,000 sq. ft. Deducting 20% for some islands that would be better left unmined we have about 500,000 sq. ft. At an average depth of 150 feet which is as much as can be assured at present, the tonnage is such a block would be about 4,000,000.

It must be born in mind that because of the irregularity of the holes the above tonnage cannot be stated as positive. However, such tonnage does seem well assured. It should also be born in mind that this comparatively small area is a small portion indeed, of the total probable commercial area or areas."

END OF QUOTES - B. of M. PUBLICATIONS - C. H. DUNNING.

In 1972 Mr. T. W. Mitcham and C. E. Cronenwett, geologist, completed a surface geological mapping of the property and diamond drilled one hole to 3500 feet. The geological mapping was part of Mr. Cronenwetts thesis: his writings, although reviewed by the writer, are not herewith quoted, the maps included in the thesis are included in this report, See Maps No. 3 and 4. - unchanged except for the writers additions to bring them up to date. Credit is therefor given Messrs Mitcham and Cronenwett.

PROPERTY EXPLORATION:

Aside from the usual surface pits, shallow shafts and deep shafts, the property was recipient of much present day methods of exploration; moderate depth churn drilling, shallow diamond drilling, one deep diamond drill hole and possibly two other shallow to moderate diamond drill holes, a partial geo-chem sampling program and several lines of geophysical surveys as well as a complete geological surface mapping of the property.

The above work was completed by Pinal Copper Corp. itself, by Miami Copper Co., Transarizona Corp. and ElPaso Natural Gas Co., the latter three completing the work on lease-purchase arrangements.

Of all this work, there is little detailed information available as diamond drill core, core geology logs, core sample assays, churn drill hole geology logs, churn drill sample assays, etc. Diamond drill core from the Companys 35 drill holes were stolen(?), no detailed geologic logs were made, no systematic sampling and assaying was completed. The deep diamond drill hole core is available for inspection but the geologic log is not available.

The Company did not obtain such factual data as geologic logs, assay records, geophysical work sheets, etc for the work completed by the three leasors, Miami Copper, Transamerica Resources and ElPaso Natural Gas Co.

The only available detailed data or information is that obtained by C. H. Dunning and reported on in his 1956 report to the Company. This meager information was QUOTED under the caption "General Geology and Mineralization".

Lack of pertinent factual data necessitates the writer to basically rely on his observations during the field examination of December 7, 1973. Lack of the data also renders much of the previous exploration useless - to the writer and any future lease-purchaser of the property.

PROPERTY POTENTIAL:

Based on the available information, the review and study of reports and concepts of others and the writers personal field examination, a property potential of two types are envisioned: (1) an oxide copper potential of depths from surface to 250 to 300 feet in the vicinity of the W/2 of Kick Back No. 11 claim, W/2 of Kick Back No. 12 claim, E/2 of Good Copper claim and E.2 of Good Copper No. 1 claim, and (2) as a deep disseminated type, primary mineral ore body, the center of which may be slightly west of the common end lines between Good Gold and Gold Bell claims, Good Copper and South Copper No. 1 claims, Good Copper No. 1 and Copper Bell No. 1 claims and Copper Bell No. 2 and Copper Bell No. 3 claims and extending 500 to 1000 feet east and west of this common line.

As regards the oxide copper potential, the writer can infer a volume of 4,000,000 tons of 1.5% or better copper content in a block 300 feet by 700 feet by 250 feet deep. As to a tonnage figure for the second type potential, the writer can only say that a "target" is indicated which must

be explored by deep drilling.

EXPLORATION REQUIREMENTS - COSTS:

As indicated earlier, two targets exist, (1) the near surface oxide copper occurance in a block representing a 4,000,000 ton inferred volume and, (2) a deep seated disseminated, primary metallization occurance west of the above oxide copper occurance. Both targets are considered in a Phase I project. The writers envisioned program and its estimated cost is as follows:

PHASE I:

8,400 feet percussion (down-the-hole) hammer drilling, @ $12.00/ft. including personnel expenses (travel) sampling and assaying. (4 months)	$ 100,800.-
50000 feet diamond drilling including personnel travel expenses, sampling and assaying @ $22,00/ft. (4 months)	$ 110,000.-
Project Supervision, general supervision, core logging, (4 months) including Fees and Expenses @ $2,800.- per month.	$ 11,200.-
Diamond Drilling extras, (casing, reaming, etc)	$ 25,000.-
Contingencies, work overrun, underestimating.	$ 23,000.-
PHASE I total	$ 270,000.-

This work and expenditure should reclassify the writers oxide copper inferred tonnage to an indicated or proven tonnage - dependent on the continuity of the results and (2) indicate the presence or existance of deep seated metallization in the second target.area.

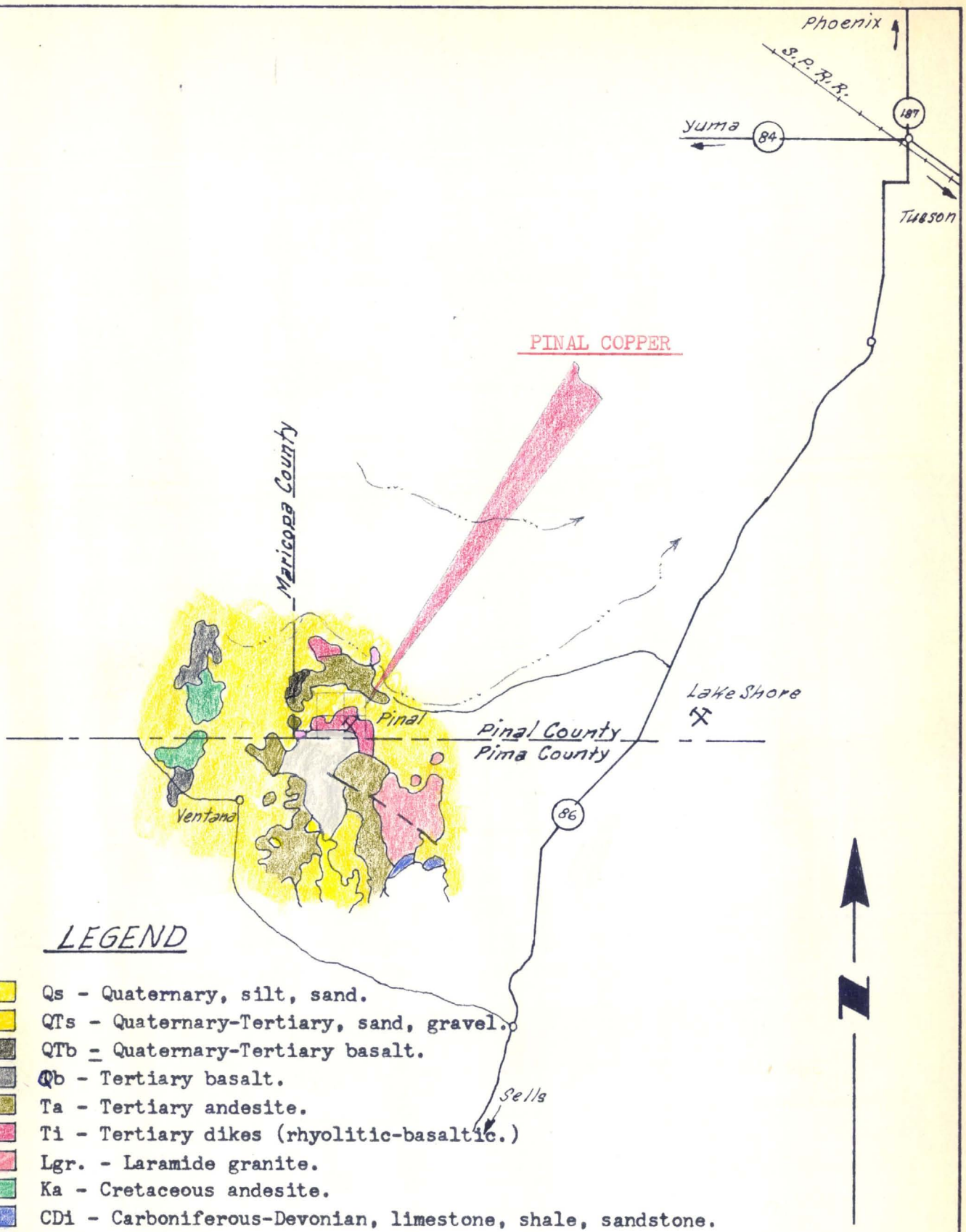
If the Phase I ppogram is successful in the above objectives, then a Phase II program should continue to (1) further reclassify the available tonnage for the oxide copper area and/or to expand the tonnage area to delimitation and (2) further "test" drill the deep seated metallization area. A Phase II program is envisioned as 8,000 feet of percussion drilling and 15,000 feet of diamond drilling for a total estimated expenditure of plus or minus $550,000.-.

If the results of a deep seated drilling in Phase II is successful, Phase III would be a requirement--to continue the diamond drilling exploration and development of the indicated ore body.

Respectfully submitted,

R. E. Mieritz,
Mining Consultant
Phoenix, Arizona

December 12, 1973



LEGEND

105 Qs - Quaternary, silt, sand.
107 QTs - Quaternary-Tertiary, sand, gravel.
199 QTb - Quaternary-Tertiary basalt.
197 Qb - Tertiary basalt.
173 Ta - Tertiary andesite.
127 Ti - Tertiary dikes (rhyolitic-basaltic.)
124 Lgr. - Laramide granite.
161 Ka - Cretaceous andesite.
144 CDi - Carboniferous-Devonian, limestone, shale, sandstone.
743T gr - PreCambrian granite.
964 Sch- PreCambrian schist.

REGIONAL GEOLOGY & INDEX MAP
(Portion of)
SW. Pinal County, Arizona

SCALE: 1"= 6 Miles

Dec., 1973 R. E. Mieritz

MAP No 1

Doc 3 Pg. 17

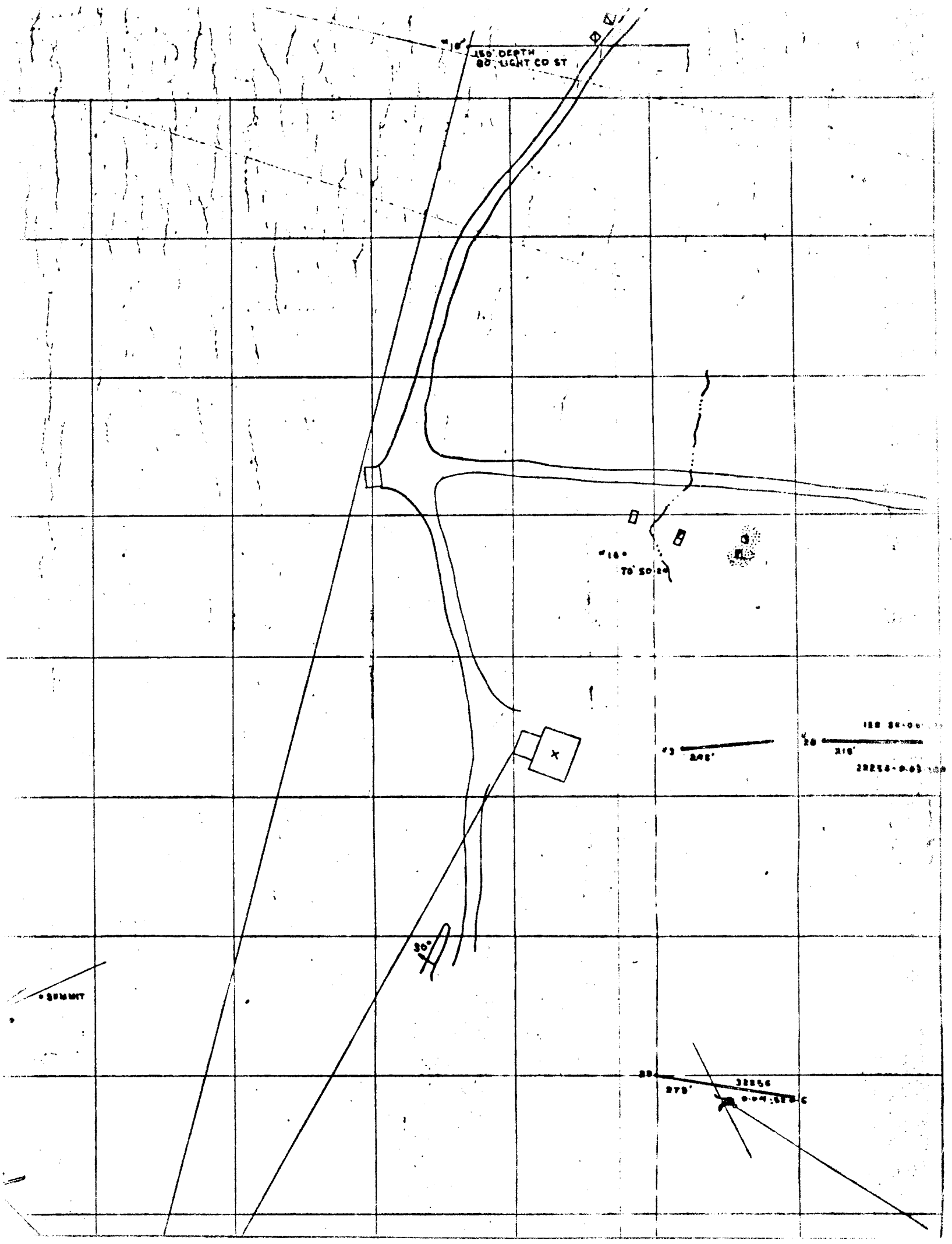
Doc 5 Pg. 18

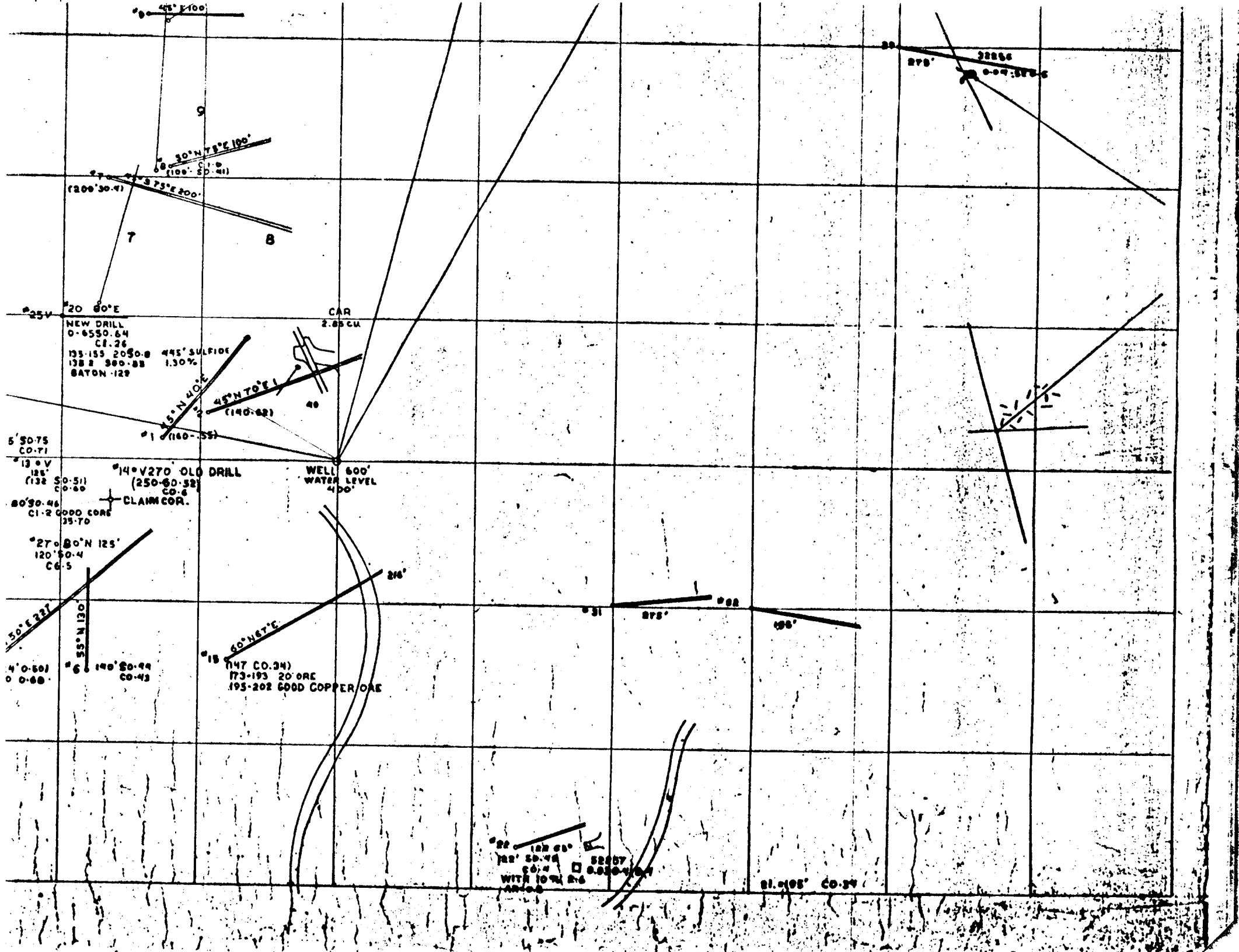
Harold - August - aug. 1954 - 62 claims - includes Gunbuck.

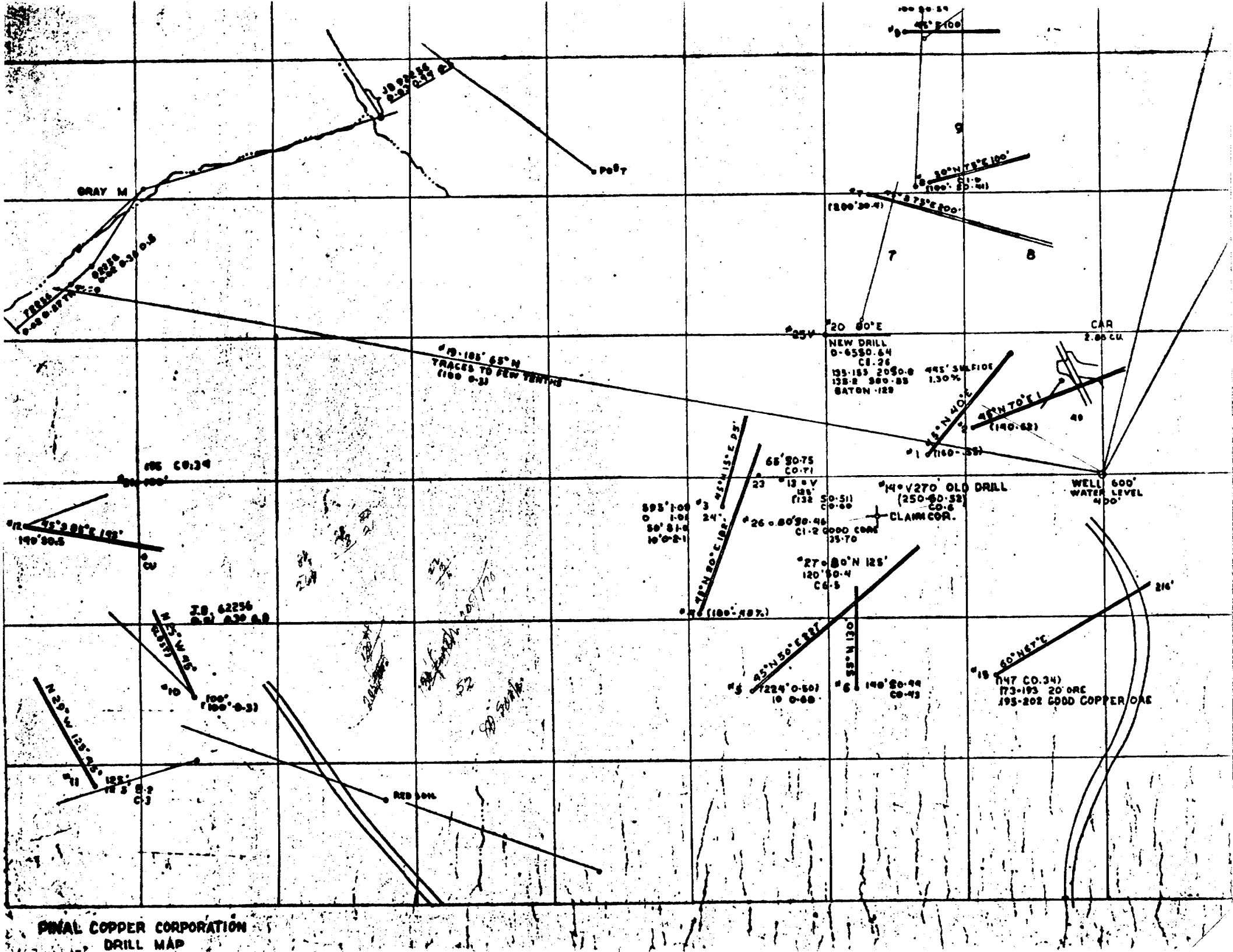
				(from left)			
					airstrip	(camp)	(well)
P.R.	26.8	22.2	28.5 (left)	(35.5)	38.5	39.6	40.0
	3.2	3.2	3.2	3.2	3.2	3.2	3.2
		26.4	31.7	38.7	41.7	42.8	43.2
				31.7	38.7	41.7	42.8

Hales Hales - 35, Miami 5 holes. G. Fee. 1. El Paso - 1
Mitcham. 1. -

M.C.P.N Az - Mitcham 8500 ft.


150' DEPTH
80' LIGHT CO ST
SUMMIT


9
7
8
#20 80°E
NEW DRILL
0-655 0.64
CI.26
135-155 20 50.8
138.2 360-88
BATON 129
445' SULFIDE
1.30%
CAR
2.85 CU
45°N 70°E
(140-62)
40
#1 (160-.55)
#13 V
125'
(132 50.51)
CO.60
#14 V270 OLD DRILL
(250-60.32)
CO.6
WELL 600'
WATER LEVEL
400'
CLAIM COR.
80°30.46
CI.2 GOOD CORE
35.70
#27 80°N 125'
120'50.4
CO.5
216'
#6 140'80.44
CO.43
#15 60°NE7°E
(147 CO.34)
173-193 20' ORE
193-202 GOOD COPPER ORE
#31
275'
#32
195'
#22
WITH 10% 2.6
81.0(95' CO.34
275'

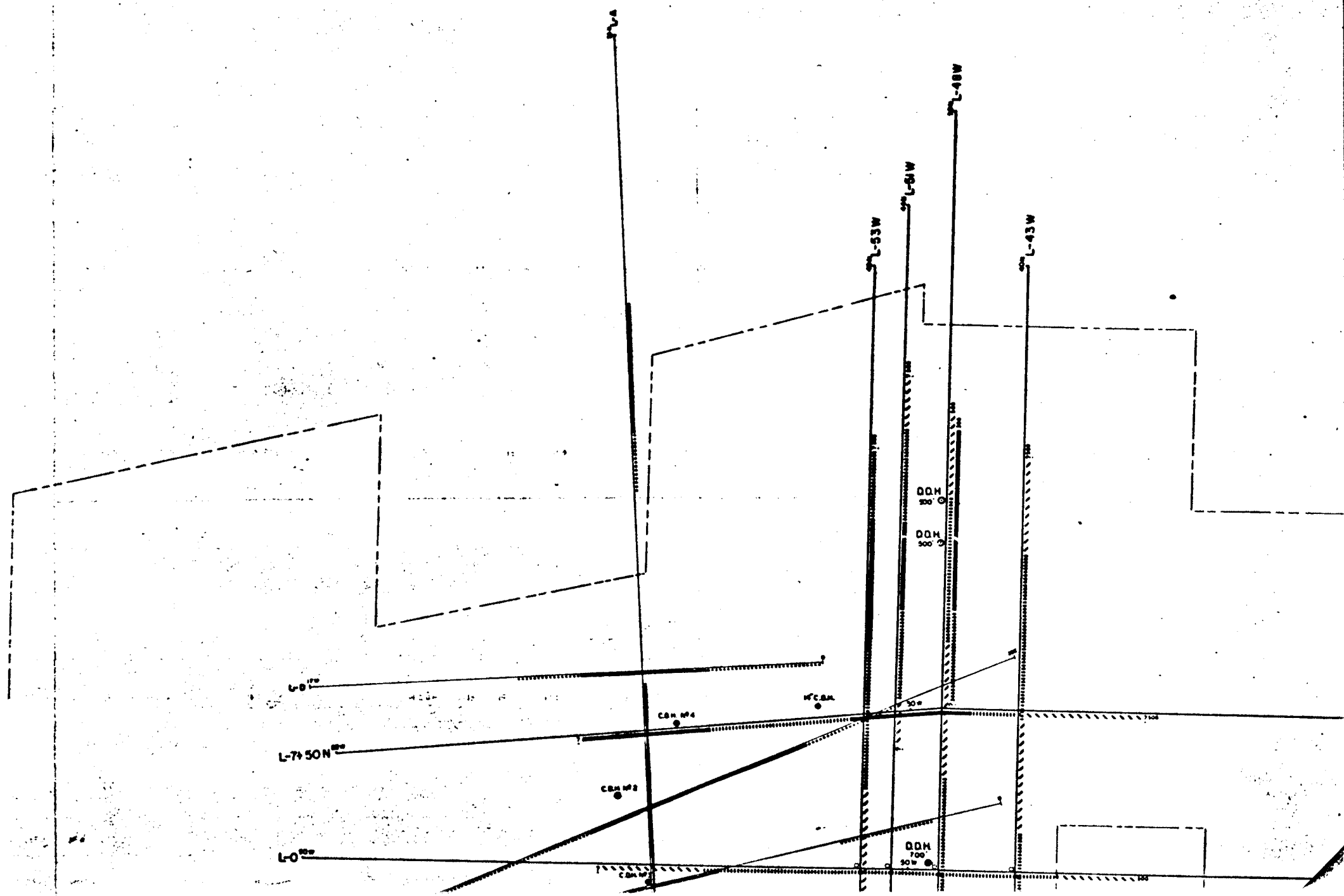


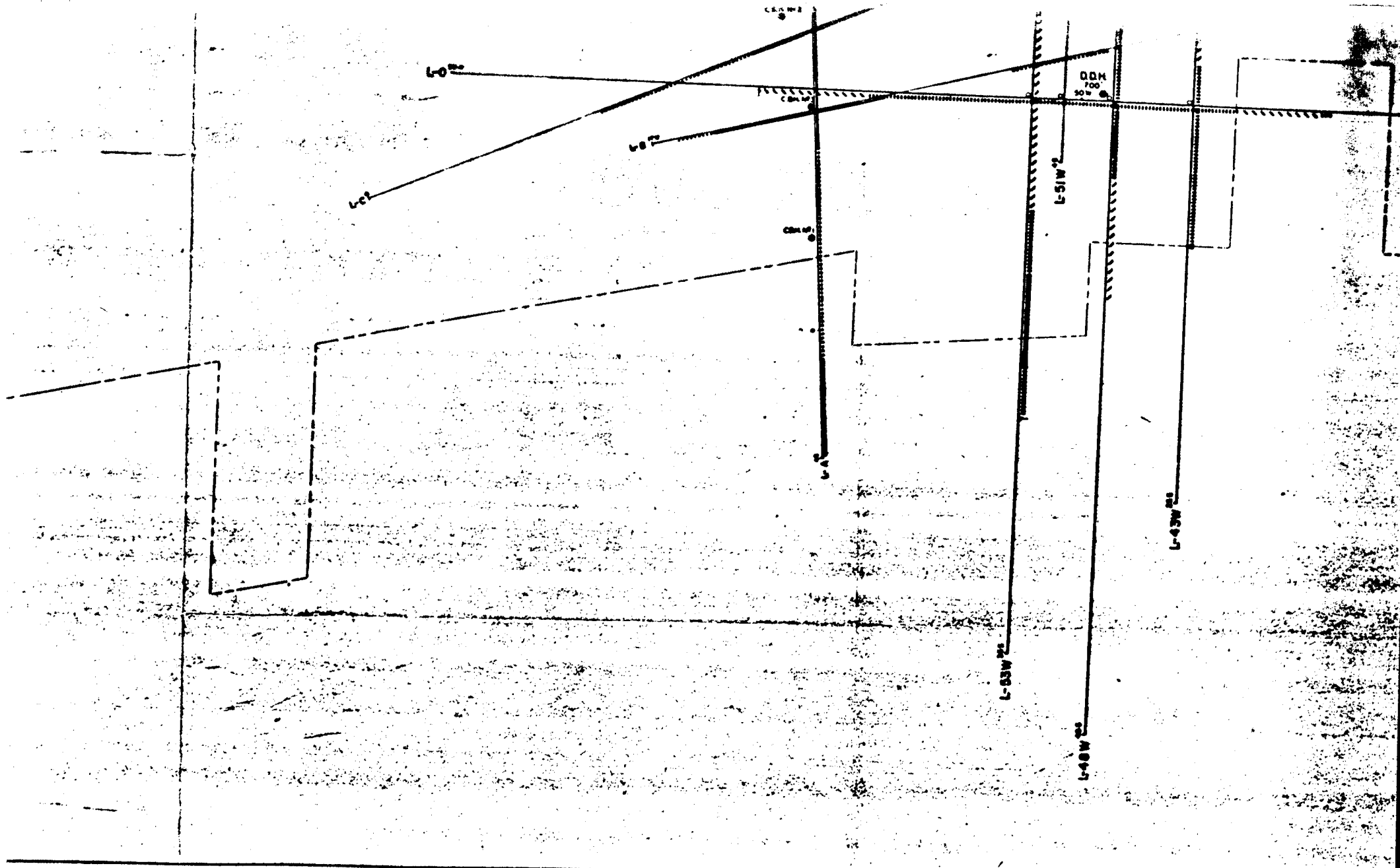
FINAL COPPER CORPORATION
DRILL MAP

McPHAR GEOPHYSICS LIMITED

INDUCED POLARIZATION AND RESISTIVITY SURVEY

PLAN MAP





SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE

PROBABLE

POSSIBLE

NUMBER AT END OF ANOMALY INDICATES SPREAD USED.

PINAL COPPER CORPORATION PROPERTY, PINAL CTY., ARIZONA, U.S.A.

SCALE

ONE INCH EQUALS FOUR HUNDRED FEET

Tenney's report - Geological Reconnaissance of the Casa Grande Mining District Pinal Co. Ariz. By M (Ariz) 1933?

James Megson as caretaker. Assessment work for 1927 was done by sinking a winze on the 500 foot level. In 1932, the group was relocated by Wesley Oates of Casa Grande, on the grounds that no assessment work had been done for 1929 and 1930. His rights were acquired shortly afterwards by Frank M. Leonard of Casa Grande.

Location and Mining Property.

The Greenback Mine is on the northwest slopes of the Cimarron Hills, about two miles southeast of the Papago Mine. It is reached by a fair desert road from the Jack Rabbit Mine, which is connected to Casa Grande by 29 miles of partially-graded county road. The total distance from Casa Grande is about 41 miles.

The group consists of 60 claims covering an area of 1190 acres, all unpatented and held by location.

Mine Development.

The principal work is at the Pinal shaft, about half a mile southeast of the camp site. This shaft was sunk to a depth of 688 feet on an inclination of about 50 degrees, the bottom 160 feet being now under water. Levels were driven east and west on the 50,150,300, and 500-foot levels, aggragating about 700 feet The most extensively developed level is the 500 foot level where 370 feet of drifting was done together with a 40-foot winze.

About 2000 feet east of the Pinal shaft, the Greenback shaft was sunk to a depth of 100 feet on a 40 degree incline. A short level was run at 50 feet, and about 380 feet of drifting to the east and west was done on the 100-foot level.

In addition to this work, a number of open cuts and shallow shafts were driven between the two main shafts.

At the camp site, a 339-foot churn drill hole was sunk, which supplies the camp with water. The camp is supplied with half a dozen small frame buildings, and a large boarding house and store.

Geology and Occurrence.

(1) The basal complex on which the lava rests at the Greenback mine consists of a series of large intrusive masses of porphyry varying in composition from diorite to quartz monzonite. These igneous rocks have been intruded into Pre-Cambrian schist, small remnant outcrops of which are found west of the Pinal shaft. Resting on a partially planed surface of these basal rocks is a thick series of basic lava flows and volcanic breccias, which have been tilted at slight angles to the northeast. The range is a typical basin-range ridge, much modified by erosion into a series of low rugged hills. The basal complex underlying the lava has been exposed by erosion in the piedmont slopes of the hills.

(3) The mineralization is all pre-lava and was probably closely related to the porphyritic intrusives. Two types of mineralization are found. In the first type the magma after solidification and partial shattering, was invaded by solutions containing potash, alumina and sparse silica, together with salts of copper. The fractures were filled with veinlets of sericite and metallic sulphides and the fragments between fractures were partly impregnated. Subsequent oxidation has left a limonite-stained, kaolinized slightly copper-stained mass containing veinlets of chrysocolla. It was an outcrop of this type at the camp site that first attracted prospectors and on which the first locations were made.

In the second type of mineralization, which probably followed the first type, the porphyry was invaded along a major north 70 degree west fault zone, by intensely siliceous solutions carrying a little iron and copper sulphides and a small amount of erratically distributed gold. This type of mineralization has been left as a network of quartz veins which strike northwest in a zone of intensely brecciated porphyry. Parts of the veins are somewhat stained

with limonite, a little green copper carbonate and silicate, and sporadic pockets rich in free gold occur. The total length of the zone is about 3000 feet and the width varies between 50 and 200 feet. The general dip of the zone is about 60 degrees to the south and the thickness of individual veins varies from a foot to over 50 feet. A last phase in this type of mineralization was the filling of post quartz fracture with calcite associated with minor amounts of iron and manganese salts. It is on the veins of the second type of mineralization that the Greenback and Pinal shafts were sunk on outcrops rich in gold. In the work done on both outcrops, the gold-rich pockets in the veins proved small. There is a possibility that they may be the tops of definite shoots, but insufficient work has been done to demonstrate this. The bottom of the ore in the Pinal shaft was reached at 50 feet and no further pockets or shoots were encountered. At the Greenback shaft the bottom of the ore was at about 35 feet. At 50 feet the character of vein filling changed, and the vein was probably cut off by a fault. The 100-foot level drifting was driven entirely in country rock cut by numerous calcite veins dipping at various angles.

At the Pinal shaft the vein dips about 50 degrees to the south and was continuous to the bottom of the shaft with an average thickness of about six feet. At the water-level about 520 feet below the outcrop, occasional grains of rusty pyrite occur in the quartz and on the walls of the vein, and assays have shown the pyrite to be frequently gold bearing. Equally high samples have been obtained from limonite-stained portions of the vein on the 150 and 300-foot levels. The outcrop at the surface on which the shaft was started was more heavily stained with limonite than elsewhere. This condition was also true at the rich outcrop at the Greenback shaft. The vein filling is very dense quarts almost devoid of vugs or fractures. It is highly improbable that sufficient ground water movement has existed in the past to have allowed for transportation and subsequent enrichment of the gold.

At the surface outcrops the quartz has been much reworked by surface waters, with the development in the few feet of surface skin of much chalcedonic quartz containing vugs lined with quartz crystals. Sampling of surface outcrops is said to be an unreliable index of values below. It is possible that any gold present may have been removed in the weathering process.

Between the Pinal and Greenback shafts are many vein outcrops, in the network of veins, more heavily limonite-stained than the two portions of the vein system prospected at depth.

In the work done at the Pinal shaft the greater part of the vein consisting of massive white quartz, was virtually barren of gold.

Possibilities.

The scattered sampling done on the property suggests the association of much of the gold with iron. Work concentrated on the more heavily limonite-stained parts of the vein may develop high grade shoots, or the values may be sufficiently disseminated to constitute a profitable low grade ore. Conditions at that part of the Papago vein, which is much stained with limonite, suggests that similar conditions may exist at the Greenback vein network in those parts more highly impregnated with iron.

SLATE MOUNTAIN

LAKE SHORE MINE

History and Production.

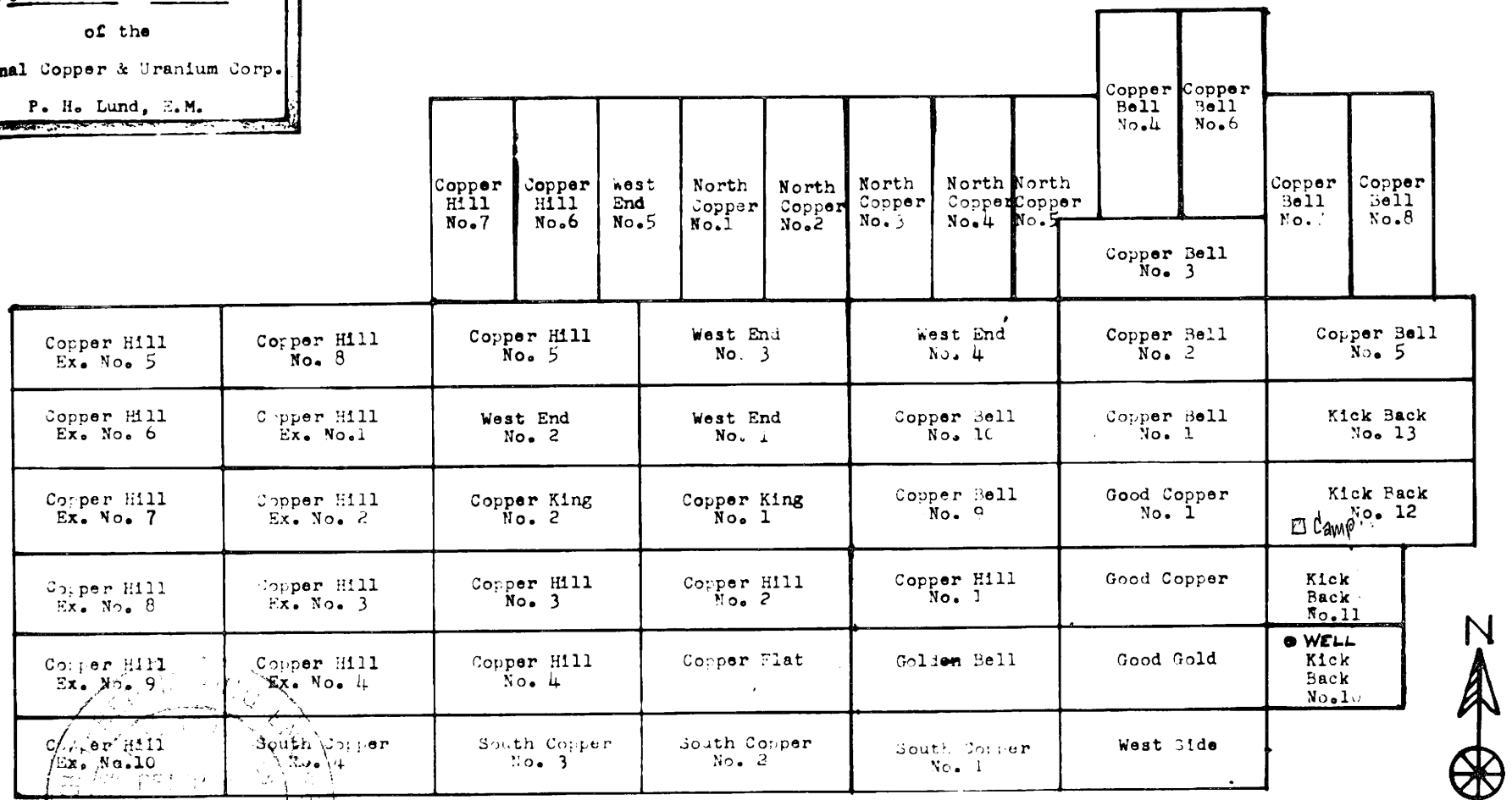
The small oxidized copper outcrop of this mine, exposed in the bottom of an arroya on the piedmont slope at the southwest end of the mountain, was

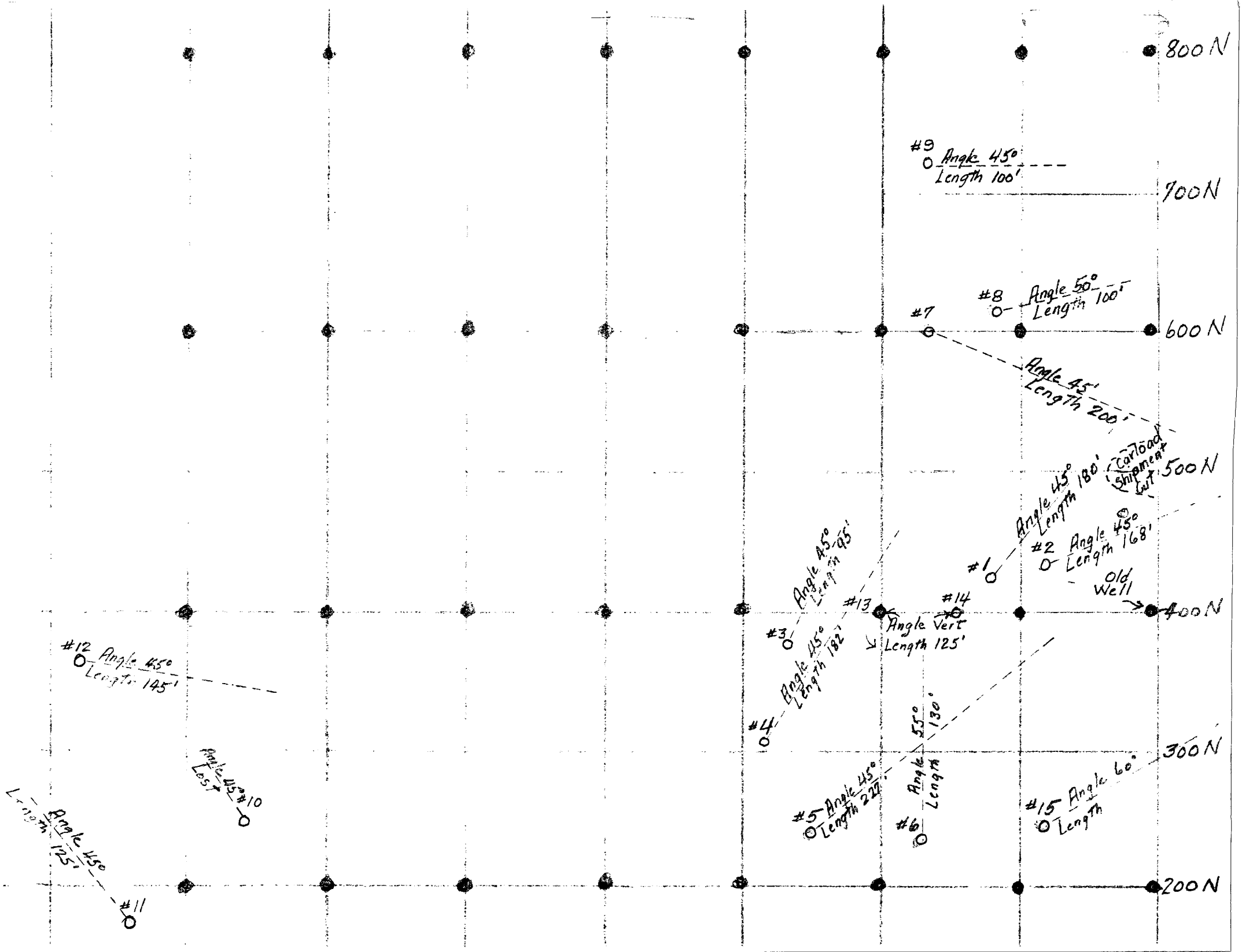
CLAIMS PLAT

of the

Final Copper & Uranium Corp.

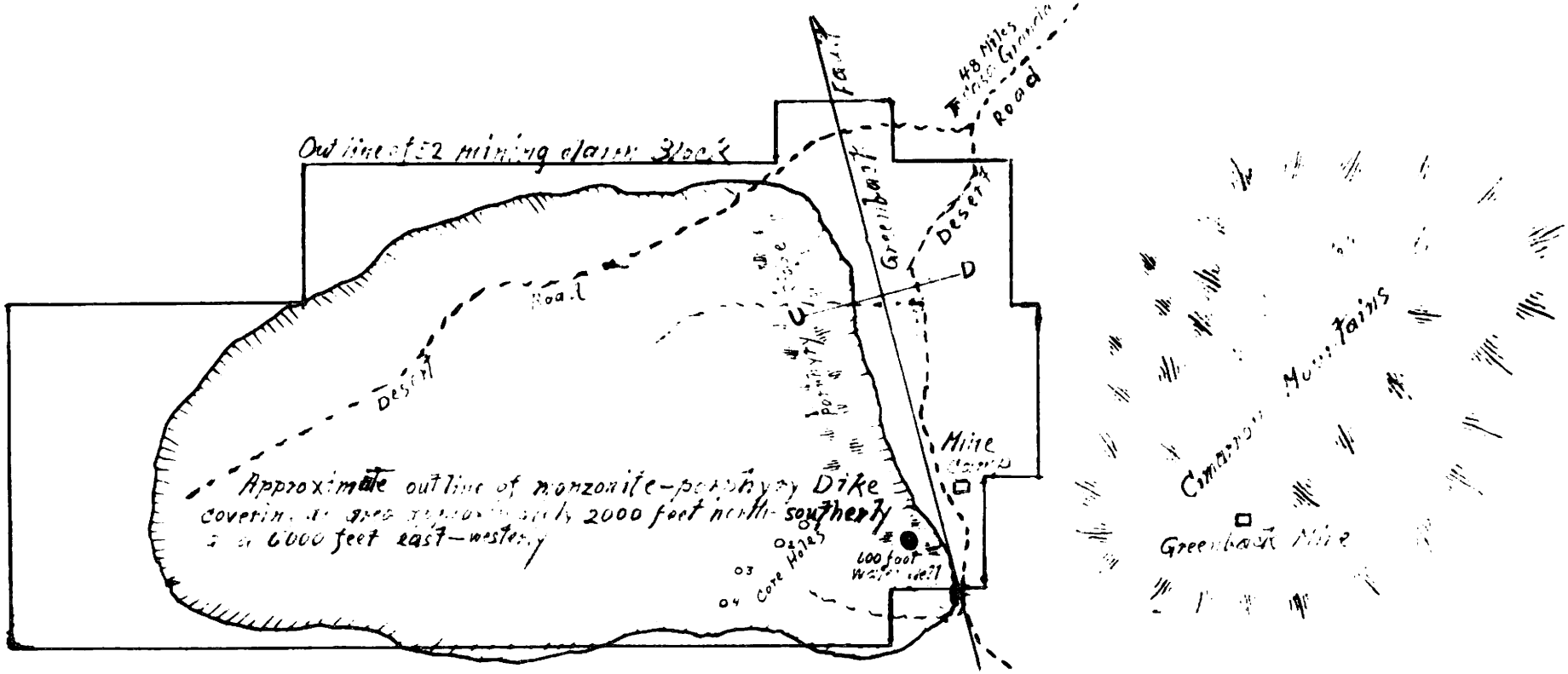
P. H. Lund, E.M.



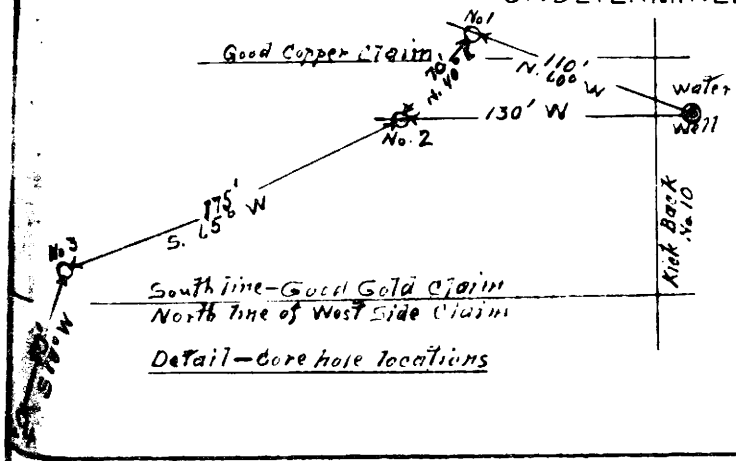

800 N
700 N
600 N
500 N
400 N
300 N
200 N
#9 Angle 45° Length 100'
#8 Angle 50° Length 100'
#7
Angle 45° Length 200'
Angle 45° Length 180'
Carload Shipment Cut
#2 Angle 45° Length 168'
#1
Old Well
#14
#13
Angle Vert Length 125'
Angle 45° Length 95'
#3
Angle 45° Length 182'
#4
Angle 55° Length 130'
#6
#5 Angle 45° Length 227'
#15 Angle 60° Length
#12 Angle 45° Length 145'
Angle 45° Lost
#10
Angle 45° Length 125'
#11

PINAL - GRANDE MINING PROSPECT

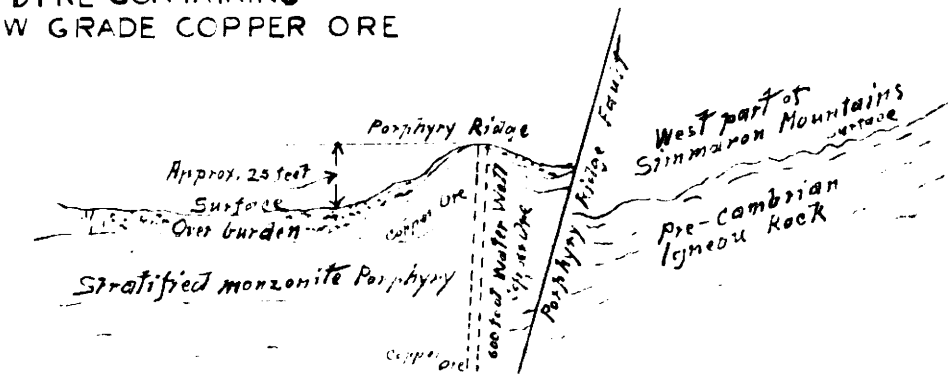
(ADAPTED TO OPEN PIT MINING)



MONZONITE PORPHYRY DIKE CONTAINING
UNDETERMINED QUANTITY LOW GRADE COPPER ORE



Detail—Core hole locations



Sketch showing cross section of porphyry ridge fault at water well

P.H. Lynd Engineering Co
Phoenix Arizona.

CHARLES H. DUNNING
MINING ENGINEER
PHOENIX, ARIZONA

OFFICE
817 W. MADISON ST.
PHONE ALPINE 3-6272

RESIDENCE
1638 W. EARLL DR.
PHONE AMHERST 5-1132

January 9, 1956

Pinal Copper & Uranium Corporation
4318 North Central Avenue
Phoenix, Arizona

Gentlemen:

Pursuant to your request, I have made a new or additional examination of your group of copper claims on the Papago Indian Reservations, south of Casa Grande, Arizona.

A previous examination and report was made in May, 1955, but since that time there has been considerable additional exploration by drilling, and further data is available on which to base opinions.

Rather than refer to the old report it is thought that this report would be clearer if it included the pertinent matter covered before.

LOCATION AND CLAIMS

The group consists of 106 mining claims or about 2000 acres, and is situated 42 miles southwest of Casa Grande on the northern slope and outlying valley of the Cimarron Hills.

Probably 40 or 50 claims would be sufficient for your present purposes, but Congress recently passed a bill allotting mineral rights on the Papago Reservation to the tribe, and after it was passed mining locations may be more difficult and expensive to obtain. As all your locations were prior to this act you are in no way effected.

GEOLOGY - GENERAL

(2) The terrain consists of a basement of Pinal Schist which has been invaded by magmas solidfying as various phases of granitic porphyry, quartz monzonite porphyry, and dioritic porphyry.

The geology at the site was quite thoroughly studied and reported upon in 1920 by Dr. G.M. Butler of the University of Arizona. There has been no cause for any change in opinions since that time, and as this is an economic, rather than a technical report, may it suffice to say that I fully agree with Dr. Butler.

LOCALIZED GEOLOGY AND ECONOMIC IMPLICATIONS
VARIOUS GEOLOGICAL SITUATIONS

Your group of claims cover several square miles, and while the basis geology outlined above applies to the general terrain there are on your group several separate geological situations, which should be treated, and also explored separately.

Unfortunately you do not have a general map of your group, with prominent markers on the ground. To get to some points on your group it is necessary to travel via roundabout roads, and then one only has a general idea of where he is. I have however, drawn a blocked out claim map and indicated thereon the approximate location of the situations to be discussed.

CENTRAL SITUATION

(4)

The central area may not prove in the long run to be "central" but is so designated at the present time. It was a natural starter for exploration because there were outcroppings of commercial ore, a water well that had drilled through ore, and an intriguing geological situation generally.

Most of your present 27 drill holes have been put down in this area.

1927 Winslow

From one open cut a test carload was shipped to smelter some years ago and assayed 2.89% copper. Copy of this smelter return is on file. Dr. Butler reports that the water well passed through 290 feet of low grade ore.

In this area the rock consists of the various phases of porphyry mentioned above and also contains some silicified zones of dykes which are sparsely mineralized.

The general course of mineralization is from the southeast to the northwest. It is bounded on the east by a major fault, on the north by valley fill, on the west gravelly fill, and on the south it contacts the schist, which constitutes a situation in itself. The total area of this Central Situation is approximately 500,000 sq. ft.

In the softer portions of this area there is generally no copper showing in the outcrop, but one need dig a few inches before copper is encountered. Angle drilling has shown: good copper in the softer areas, special enrichment along the contacts with the harder zones, very low grade copper in the hard zones themselves.

These conditions lead one to believe that the entire area was originally one of moderate or low grade content, much like the hard zones. The softer zones have been amenable to leaching and such leached copper has precipitated and enriched such soft zones for some vertical distance immediately below the surface. The hard zones have been comparitively unleached but have acted as dams against percolating solutions causing extra enrichment along their walls.

It would therefore seem that you are already in as much of a secondarily enriched zone, with your drill holes as you can hope for. The present water level was not the controlling factor in this secondary enrichment, and it is doubtful if you will find further enrichment, or commercial ore, below that indicated by your present drilling, in this Central Area.

This does not preclude there being a good sized open pit mine of leachable ore in this area. You will have to contend with some low grade hard ribs which you may be able to dodge in mining, or excavate and waste like ordinary overburden. And you are especially fortunate in having practically no ordinary overburden to remove, thereas in most Arizona open pit mines the ratio of waste overburden that must be removed is about two tons waste to one ton ore.

SOUTHEAST SITUTATION

This area, prospected by Hole #22 seems to comprise the extension of a mineralized condition spurring off from the Central Area. A general sample of Hole #22

assayed 2.00% copper. Drilling proof that there was continuity between the Central Area and this situation would add large tonnage to "assured ore", and economic features to an open pit.

SOUTH SITUATION

In the general area designated as the "South Situation" geological conditions are quite different. Here the mineralization is in schist. Bands of the schist that are normal, and predominate, show intense leaching, with traces of copper remaining. Oxidized iron minerals are of the type that once contained copper. Silicious lenses that are normal to such a schist, are unleached but show copper approaching commercial grade.

Schists of this type, when invaded by copper bearing intrusions are often more receptive to replacement by copper than monzonitic type rocks, thus forming higher grade ores. This highly mineralized and leached schist area could easily form rich secondary, and commercial primary, ore zones. It has good possibilities of developing into the best producer of any area you have. It should be explored by preliminary drilling.

NEAR WEST SITUATION

Proceeding west from the Central Area the terrain is mostly covered with alluvium, except for some croppings in washes (such as situation 30 - q.v.). But at a distance of about 1/2 mile an area of highly kaolinized monzonite or rhyolite outcrops. There are a few ten foot prospect holes showing a little copper.

Kaolinization is an alteration of the constituents of rhyolitic type rocks caused by chemically charged solutions. Such conditions portend mineralization when they occur where economic minerals are indicated in the altering solutions. Such situations are also prone to subsequent leaching.

Such an area of kaolinization, with a bit of copper remaining, in a general area of copper mineralization, certainly justifys exploration by drilling. Here there could well be a secondary zone of the chalcocite type.

FAR WEST SITUATION

This area, from a mile to a mile and a half west of the Central Area again shows a highly mineralized condition. It cannot be defined, mapped, nor tied in geologically

until there is a survey with ground markers. To the south it seems to tie into unmineralized schist; to the west it is covered with later volcanic flows. But generally speaking there is a lot of good looking country there that warrants exploration.

NORTHEAST SITUATION

Immediately northeast of your Central Area there seems to be a band or zone of comparitively unmineralized rock. Further northeast drill holes #16 and 18 were put down and penetrated soft, leached, low copper bearing material. This area looks doubtful but justifies a bit of further exploration.

SITUATION "30"

For lack of a better name I have called this area "30" because assay samples taken there happened to be numbered 30, 31, and 32. Here we have a hard silicified zone cropping across a gulch. No copper was apparent but a peculiar shade of some of the red "iron" led me to suspect red copper oxide. An average sample assayed .90% copper. Sample #31 was taken of a different type of porphyritic material on the hangingwall side of the silicified zone. It was leached and showed no visible copper, but assayed .30%. Sample #32 was taken of the same hard silicified band as sample 30, where it outcrops through the gravel fill about 100 yards southeast from #30. It assayed 1.20% copper.

This general area warrants exploratory drilling. Like the South Situation, the values in the hard rib, and slight remaining values in its soft neighbor indicates important secondary values at reasonable depth in the leachable material.

TONNAGE AND AVERAGES

Twenty seven diamond drill holes have been put down but they have not been systematically spaced (see map) nor have the cores or sludges been consistently assayed.

At the time of my examination in May 1955, I sampled the cores from holes 3, 5, 8, & 14. These were selected as being fairly representative of the general area covered by the then 15 holes. Assays were as follows:

Hole #3	1.40%
Hole #5	3.30
Hole #8	3.40
Hole #14	1.50

More recently I have sampled the cores from other holes with results as follows:

#3 upper portion	3.00%
#14 middle portion	1.50
#20 from 25' to 45'	2.80
#22 general	2.00
#23 general	1.40
#26 general	1.60
#27 general	.50

This last lot of assays, represented by the attached Certificate, were selected for the following purposes:

(a) To check or train the eye in estimating other holes or cores.

(b) To supply a diversified set of standards so that quick colormetric assays can be made at the mine.

(c) To obtain definite and positive results in at least a few holes and in some unknown situations (the 30s).

The average of all of the above assays is about 2.00% copper. Judgement indicates that the average of all the holes, or of the area covered by the holes would be somewhat less - probably 1.40% to 1.60%. And in considering this area or tonnage a further allowance must be made for the very low grade hard ribs mentioned above, although they may not have to be mined.

The general area covered by the holes, without including some outlying holes, is approximately 640,000 sq. ft. Deducting 20% for some islands that would be better left unmined we have about 500,000 sq. ft. At an average depth of 150 feet which is as much as can be assured at present, the tonnage is such a block would be about 4,000,000.

It must be born in mind that because of the irregularity of the holes the above tonnage cannot be stated as positive. However, such tonnage does seem well assured. It should also be born in mind that this comparatively small area is a small portion indeed, of the total probable commercial area or areas.

LEACHING TESTS

A copper leaching test made by the Arizona Bureau of Mines, April 12, 1955, shows the oxidized ore to be amenable to sulphuric acid leaching. Head sample was 2.01% copper, extraction 81.2%, and acis consumption 70.5 lbs per ton or ore. This ratio of 1.75 lbs of acid to 1.0 lb of copper is normal. Cost of acid in operating a plant on that grade of ore would be about 1.00 per ton. On lower grade ore it would be proportionally less.

JUSTIFICATION FOR LEACHING PLANT

With an assurance of several million tons of ore containing in the neighborhood of 30 lbs copper per ton, and showing good amenability to leaching, you are well justified in considering a moderate sized leaching plant of say 500 to 1000 tons per day.

But before such plant is installed or designed very thorough tests should be made on the various types of your ore, on a pilot plant basis.

COSTS AND GENERAL ECONOMICS

On a basis of 500 to 1000 tons of leaching ore per day from open pit I would estimate that your operating costs should not be greater than the following:

MINING:	Mining and delivery to plant, including necessary stripping of overburden, and wasting of non-commercial islands.....		1.00
MILLING:	Acid and iron	1.50	
	Labor and other	1.50	3.00
OVERHEAD AND TAXES:	(Not including income taxes).....		.50
MARKETING:	(Deducted from value of copper)		
	Total		$ 4.50 per ton

Assuming 30 lbs copper per ton and 80% extraction you would recover 24 lbs of copper per ton. The present market for copper is 43¢ but it would be a bit sanguine to project such price very far in the future. A price of 36¢ would seem a fair basis for estimates. If the market is 36¢ you will actually receive about 33¢ the difference covering freight, refining and sales costs (marketing).

24 lbs copper @ 33¢	$ 7.92
Deducting operating costs	4.50
Profit before income taxes.....	$ 3.42 per ton

CAPITAL

To achieve this operating profit rather large capital expenditure will have to be made. They will be discussed further under "Recommendations", but generally speaking a well engineered plan for coordinate drilling of the Central Area, and exploratory and some coordinate drilling of the other areas will require....$ 500,000.

Pilot plant and thorough testing of the ore, together with cost of the above mentioned leaching plant.....$ 300,000.

Miscellaneous and corporate expenses, and operating capital.....$ 200,000.

Total.....$ 1,000,000.

MAPS

Attached to this report is a map showing the block of claims with the above mentioned areas roughly outlined. Also a map, drawn in coordinates, of the area where most of the drilling has been done. Present drill holes are spotted on this map, and it is recommended that further drilling be done with vertical holes at these coordinates.

RECOMMENDATIONS

All of the old drill cores or sludges should be assayed and mapped. Such map should show the respective elevation of the collars of th holes.

A survey should be made of the claims, erecting prominent claim corners, each with a tag showing what corner it is. Then a geological map should be prepared using these corners as field markers.

Coordinate drilling should be carried on in the Central Area. This will result in your being able to segregate the ore and waste zones, estimate definite or positive tonnages, average values, and thickness of ore and overburden at all points. This is all essential information before planning your pit operation.

Exploratory drilling should be carried on in the other areas mentioned, to be followed by at least some coordinate drilling as soon as preliminary information is obtained.

An engineer or mettalurgist experienced in copper leaching should be employed at least part time, and a pilot plant can be built and put in operation as soon as practicle. All types of ore from all locations should be tested.

Coordinate drilling and pilot plant tests could well reach conclusive results simultaneously, and you would then be ready to design and install a commercial plant.

Roads should be repaired to stand up under heavy traffic, and the waste material from pilot plant operation, or from overburden excavation, should be useful for that purpose.

Systematic sampling of drill cores and/or sludges should be carried on continuously and the results tabulated and mapped.

CONCLUSION

You have a large but not definitely measurable tonnage of commercial ore, and very large areas of probable ore.

If development and operation is carried on according to good engineering practice the project should be very successful.

Respectfully submitted,

Chas H Dunning

CHARLES H. DUNNING

REGISTERED MINING ENGINEER
CERTIFICATE EXPIRES
CHARLES H.
DUNNING
DEC. 31, 19
ARIZONA, U.S.A.

Southern area
1" = 500'

12-4-73

Pinal Copper - Kipal Dist - Sec 29, 32, 33, T 10S R 2E - 1 mile
17 claims, shaft, pit S. of Shumback Mine 401 E. Indian School Rd. Incorp. 1954
Miami - 3 holes in wide alun zone sporadic only near surface -
below 125-175 very few material encountered 4% - 10% cu. andesite
porphyry - altd. Principal cu around bottom of the altered zone
of Lake Square

Harold Fessler - W.P. 52 claims - Lucia Diamond Drilling Co.
1919 - churn hole (well -) to 280
Holes 1-4 - Arizona Testing Lab.
History - 1890's 1916, 10 claims by Humphrey - 1917 - Pond Nonnbaum purchased.
1919 well drilled 289' limits of chrys. & cand.
Shumback shaft - 100' values to 50' - 100 hr. small drifts negative.
Pinal shaft - 96', sunk to 475' drifts 150' & 300 hr. small pockets Cu found.
sunk to 688'. Shumback shaft 2000' east of Pinal shaft.

12-6-73

Economic Geological Bran. of Casa Grande Mining District
T. B. Tenney. Ariz. Bd M. & M. Bulletin, Director 1933
Amer. Metals & Tucson group also did drilling.

P.H. Lund 52 claims
25 miles to coppersity road. 15 miles to Junction then westerly 8 miles.