File Copy
Surname

Nelson
Gehan
Selfridge
Hoffman

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

APR 23 1956

Mr. John C. Foster, President
Arizona-Golconda Metals, Inc.
60 Wall Street
New York 5, New York

Re: Docket No. DMEA-4033 (Lead-Zinc-Copper)
Arizona-Golconda Metals, Inc.
Golconda Mine
Mohave County, Arizona

Dear Mr. Foster:

Your application for aid for an exploration project and other data available to us in Washington concerning your mine have been reviewed.

Projects approved by the Defense Minerals Exploration Administration must, in its judgment, show definite promise of yielding materials of acceptable grade in quantities that will significantly improve the mineral supply position for the National Defense Program.

Although the Golconda mine produced a substantial amount of complex zinc-lead-copper ore in the past, a careful study of available information indicates that the possibility of disclosing additional ore of this type in sufficient quantity and grade to be of importance for the national defense is not sufficiently promising to justify Government participation in your proposed program. Therefore, I regret to advise that your application for exploration assistance is denied. However, the denial is made without prejudice to the property.

I wish to thank you for your interest in the Defense Minerals Program and for bringing your property to our attention.

Sincerely yours,

C. G. Mittendorf

Administrator

WRGriswold/er (4/16,17 & 20/56)
Copy to: Docket
Admr R File
Op. Committee
Base Metals
Mr. Bishop, USBM
Mr. Kiilsgaard, USGS
Region III (2)
Chron.

R.C.L.

File Copy
Surname
Mirandt
noted - Gehan
noted - Kilgar
Selfridge
Fleming

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

Mr. John C. Foster, President
Arizona-Golconda Metals, Inc.
80 Wall Street
New York 5, New York

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Copy to: Docket
Admr R File
Op. Committee
Base Metals
Mr. Bishop, USBM
Mr. Kiilsgaard, USGS
Region III (2)
Chron.

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION 500
WASHINGTON 25, D. C.

April 20, 1956

Memorandum

To: The Administrator

From: Chief, Base Metals Division

Subject: Denial of Application, Docket No. DMEA-4033, Arizona-Golconda Metals, Inc., Golconda Mine, Mohave County, Arizona, Lead-Zinc-Copper.

We regret denying the cited application. The mine has had quite a production; in round numbers about 28,000 tons of zinc metals, 1,000 tons of copper, 175 tons of lead, half a million ounces of silver and some 20,000 ounces of gold. The ore tonnage from which the above was derived probably was something around 300,000. Most of the production was in the years 1915, 1916 and 1917. In October 1917, a fire destroyed the mill and most of the surface plant and little has been done since then. The mine was opened to a depth of 1,400 feet and a strike length of some 3,000 feet.

The Field Team believes that 80,000 tons of ore may be assumed as inferred and potential, though no one has been able to get into the flooded old lower mine levels. The Field Team, using old production records, estimates that such ore might have a value of 14 per cent zinc, 0.5 per cent lead, 0.5 per cent copper, 4 ounces of silver and 0.20 ounce gold per ton.

Actually, the ore potential may be much greater than suggested by the field. Furthermore, in the Field Team report, we find various statements such as: "If . . . the production plan included concentration and shipment to a smelter, smelter returns would be insufficient to pay even the mining costs." The report contains some calculations designed to prove the above statement. We are not in accord with the statements nor the metallurgical calculations used in their support.

Actually, the ore would be considered as being of satisfactory milling grade. However, there are certain features which render the project undesirable.

(a) Much of the proposed work is pure development.

(b) The Applicant has no title or easement through the tunnel from which the most important work would stem out.

(c) The Applicant is basing his economics upon the fantastic idea of installing a roast-leach-electrolytic zinc plant. Such a plant, in addition to zinc, would be expected to recover germaniun, gold, silver, indium, cobalt, cadmium, etc.

In view of the above, we must concur in the recommendation for denial.

W. R. Griswold

W. R. Griswold

File Copy
Surname
Nelson

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION 500
WASHINGTON 25, D. C.

April 20, 1956

Memorandum

To: The Administrator

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In view of the above, we must concur in the recommendation for denial.

W. R. Griswold

W. R. Griswold

WRG/er

Copy to: Docket
Base Metals
Chron.

TELEPHONE
WHITEHALL 3-9361

MINE
KINGMAN, ARIZONA

ARIZONA-GOLCONDA METALS, INC.
SUITE 718
80 WALL STREET
NEW YORK 5, N. Y.

RECEIVED
APR 4 - 1956

Docket

Griswold

April 3, 1956

Office of Defense Minerals Exploration Adm.
Washington 25, D. C.

Attention Mr. Willis Griswold

Dear Mr. Griswold:

In October 1955, this Company applied to your office for a D. M. E. A. loan and the contents of same is under your file #4033.

Your field men from the Denver office visited our mine, made up their report and reported back to Denver on February 2nd. 1956.

Since that time we have not heard from your Department as to whether or not we might expect to have this loan come through.

If there is anything you can tell us as to the status of same, the writer would appreciate it.

The writer had occasion to lunch with Frank Ayer the other day and he wishes me to convey his kindest regards to you.

Hoping to hear from you at your earliest convenience, I am,

Sincerely yours,

John C. Foster

John C. Foster President
Arizona-Golconda Metals, Inc.

JCF/sg

4033

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES
WASHINGTON 25, D. C.

RECEIVED
APR 13 1956
Griswold

April 12, 1956

Re: DMEA Docket 4033; Pb-Zn-Cu;
$166,750
Arizona-Golconda Metals, Inc.
Golconda Mine
Mohave County, Arizona

Memorandum

To: W. R. Griswold, DMEA

From: O. M. Bishop, Branch of Base Metals

Subject: Field team review and field examiners' report of March 14, 1956, received March 29, 1956

W. R. Storms and J. N. Faick review the field examiners' report noting the complex nature of the application, and the fact that the property has been the basis of two previous applications which were denied.

The examiners, Romslo (Mines) and Bryner (Survey) state that the Golconda mine has produced 28,000 tons of zinc, 1,016 tons of lead, 177 tons of copper, 510,000 ounces of silver and about 21,000 ounces of gold between 1901 and 1948 (chiefly in 1915-17). The Golconda vein occurs in a pre-cambrian gneissic granite; strikes N 40° W; dips 50-70 degrees NE; and has been opened to a depth of 1,400 feet and for a strike length of about 3,000 feet. Productive parts of the vein ranged from 2-7 feet in width and the economic minerals were sphalerite, galena and chalcopyrite. The mine is flooded below the 600 level and the potential for deep exploration can only be gauged in terms of geologic inference.

Old mine maps indicate 40,000 tons of inferred ore (14 percent zinc, ½ percent lead, ½ percent copper, 0.20 ounces gold and 4 ounces silver) with minor uranium, germanium and indium values.

The applicant's proposal to extend the Prosperity adit 300 feet (600-foot level), the Primrose adit 500 feet (500-foot level), and the Peach adit 3,000 feet to connect with the Golconda 1,000-foot level, together with ore bins, ore pockets, and a hoist is in the opinion of the examiners in large measure development work rather than exploration. They believe, however, that the exploratory phases of the Peach adit to the Golconda shaft would

explore for the extension of an ore-shoot shown on old maps at the junction of the Primrose and Golconda veins, and hence might have some merit.

The field examiners, Tucson reviewing officers and Region III field team all recommend denial of the application on the grounds that the program is chiefly development, and the property offers but limited economic potentialities, because of high mining, freight, and smelting costs. It is recommended further that the denial be without prejudice pending examination of the lower levels when and if they are made accessible. I concur with these recommendations.

O. M. Bishop

O. M. Bishop

Copy to: Division of Minerals
Branch of Base Metals (2)
Mr. Kiilsgard, Rm. 5222
Mr. Geehan, Rm. 3608
Files

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES
WASHINGTON 25, D. C.

RECEIVED
APR 1 3 1956

April 12, 1956

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O. M. Bishop

O. M. Bishop

OMBishop:ern

Copy to: Division of Minerals
Branch of Base Metals (2)
Mr. Killegard, Rm. 5222
Mr. Geehan, Rm. 3608
Files

IN REPLY REFER TO:

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WASHINGTON 25, D. C.

RECEIVED
APR 4 - 1956

April 3, 1956

Re: DMEA 4033
Arizona - Golconda Metals, Inc.
Golconda mine
Mohave Co., Ariz.
$166,750.00 - Lead, zinc

Memorandum

To: W. R. Griswold, Defense Mineral Exploration Administration

From: N. E. Nelson, U. S. Geological Survey

Subject: Review of Field Team report

The applicant requested assistance in exploring at depth a vein that was productive in the upper levels of an old mine and in the rehabilitation of parts of the mine workings.

The application implies the following metals are present in the ore: zinc, lead, copper, gold, silver, germanium, indium, cobalt, cadmium, uranium, bismuth, tantalum and columbium.

A roasting-leaching-electrolytic process, untried so far as the products of this mine are concerned, is contemplated for recovering the many metals.

The property has been the subject of two previous requests for assistance, DMA 494, and DMA 50-21, 1951, both of which applications were denied, principally on the ground that the probable grade of the ore will not, as of this time, sustain a profitable operation. The reserves are estimated at :

Tons		Grade				
Inferred	Potential	% Zinc	% Lead	%Copper	Oz Silver	Oz Gold
40,000	40,000	14	0.5	0.5	4.0	0.20

The percentages of the other metals are too indefinite to warrant consideration at this time.

The conclusions of the examiners, based on the uncertain and immediately unfavorable economic outlook of the project are well taken.

I concur with the recommendation of the Field Team that the application be denied without prejudice.

N. E. Nelson

N. E. Nelson

IN REPLY REFER TO:

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WASHINGTON 25, D. C.

RECEIVED
APR 4 - 1956

April 3, 1956

Re: DMEA 4033
Arizona - Golconda Metals, Inc.
Golconda mine
Mohave Co., Ariz.
$166,750.00 - Lead, zinc

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I concur with the recommendation of the Field Team that the application be denied without prejudice.

N. E. Nelson

N. E. Nelson

NENelson:btr
4/3/56

cc: Director's reading 4212
Branch reading 4212
DMEA (3)
Docket File
Chron. File
O. M. Bishop, Rm. 3617.

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

RECEIVED
MAR 30 1956

March 26, 1956

224 New Customhouse
Denver 2, Colorado

Approved

Memorandum

To: Secretary to the Operating Committee, DMEA

From: Field Team, Region III

Subject: Joint Report of Examination, Docket DMEA 4033 (Lead-Zinc-Copper), Arizona-Golconda Metals, Inc., Golconda Mine, Mohave County, Arizona

Enclosed are the original and three copies of the joint engineering and geologic report on the subject property.

The field examiners concur in the recommendation that the application be denied, largely on the basis of economic potentialities. Information obtained by the examiners came from old maps and old reports since the lower workings are not accessible.

We believe that this application might well be denied without prejudice pending a reexamination of the property when and if the lower mine workings are opened.

DMEA Field Team, Region III

W. M. Traver

E. N. Harshman

Enclosures

Reviewed by
DMEA OPERATING COMMITTEE
4-2-56
(date)

DMEA
Date Rec'd.
MAR 23 1956
BUREAU OF MINES
Denver, Colorado

MINERAL DEPOSITS
MAR 22 1956
GEOLOGICAL SURVEY
DENVER, COLORADO

Box 4126 University Station
Tucson, Arizona

March 14, 1956

TRANSMITTED
MAR 26 1956

Memorandum

To: Executive Officer, DMEA Field Team, Region III

From: W. R. Storms Through E. N. Harshman
J. N. Faick

Subject: DMEA Docket 4033, Examination report of the Golconda Mine, Arizona-Golconda Metals, Inc., Mohave County, Arizona.

Transmitted herewith are the original and 10 copies of an examination report on the above subject property, which has been prepared by T. M. Romalo, U. S. Bureau of Mines, and Leonid Bryner, U. S. Geological Survey. This report is longer and much more comprehensive than is normally submitted by DMEA because of the complex and involved nature of the application. This is the third application received by DMEA on the Golconda mine; it was previously examined as part of DMA-494, and DMA 50-21, in 1951, at which time the application was denied, because it was shown the mine could not be operated on the existing ore reserves, which are of submarginal grade. Application DMA-494 and the present application are similar in at least 3 respects: 1) the property is under essentially the same management; 2) the reserves are essentially the same order of magnitude; 3) the production plans are similar and depend on unique and involved metallurgical processes.

Approved by
DMEA OPERATING COMMITTEE
4-2-56
(date)

J. S. Bagg, manager, bases all hope for the success of the venture on construction and operation of a roast-leach and electrolytic plant for the recovery of zinc and several other metals.

Romalo re-appraised the possibility of operations by conventional methods and examined the feasibility of the operation's plans. In both cases his estimated costs of production exceed the value of the ore. The Golconda ores are not yet known to be amenable to the proposed roast-leach treatment, and the limited reserves do not justify the cost of the necessary plant.

Another unfavorable aspect of the application is the fact the company has had 3 names since J. S. Bagg organized it in 1950 or 1951, and this may indicate unfavorable promotional aspects within the Company. Furthermore, entrance to the mine through the Peach adit may be illegal, and property rights appear clouded, although these probably could be clarified. Competence of the local manager was questioned in a letter submitted in June 1951, in connection with docket DMA-494, and this remains unchanged.

In favor of the application is the reasonably conservative estimate of minable grade ore on the old Golconda property. To seek this ore a small part of the project would be legitimate exploration if it were not dependent upon economics and upon metallurgical treatment of the ore by unproven processes.

The fact that the Golconda ores have been shown to be submarginal, and that the venture is involved in complex and expensive metallurgical processes leads to the conclusion that this project is not to the best interests of the Government. We therefore concur with Romalo and Bryner in recommending denial of the application.

Walter R. Storms

W. R. Storms

J. W. Faick

J. W. Faick

cc: Executive Officer (10)
Storms (1)

UNITED STATES
DEPARTMENT OF THE INTERIOR
DOUGLAS McKAY, SECRETARY

MAR 5 2 1956

DEFENSE MINERALS EXPLORATION ADMINISTRATION

REPORT OF EXAMINATION BY FIELD TEAM
REGION III

TRANSMITTED

MAR 26 1956

DMEA-4033, Arizona-Golconda Metals, Inc.

Golconda Mine (Zinc, Lead)

Mohave County, Arizona

T. M. Romslo, Mining Engineer
U. S. Bureau of Mines

Leonid Bryner, Geologist
U. S. Geological Survey

March 1956

Reviewed by
DMEA OPERATING COMMITTEE
4-2-56
(date)

RECEIVED
MAR 30 1956
TRANSMITTED
MAR 26 1956

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

By T. M. Romslo[1] and Leonid Bryner[2]

The Defense Minerals Exploration Administration received an application from Arizona-Golconda Metals, Inc. for aid in exploring for zinc, lead, copper, gold, silver, germanium, indium, cobalt, cadmium, uranium, bismuth, tantalum and columbium at the Golconda Mine, Wallapai Mining District, Mohave County, Arizona. The application was received and docketed as DMEA-4033, October 26, 1956.

The total production from the Golconda mine from 1901 to 1948 was as follows:

Zinc	56,226,020	pounds
Lead	2,031,719	"
Copper	354,703	"
Silver	510,180	ounces
Gold	20,752	"

Most of this production was during the years 1915, 1916, and 1917. In October 1917 a fire destroyed the mill and most of the surface plant. Since then, the mine has remained essentially inactive though a few intermittent and small-scale attempts were made to resume operations. In 1955, under the managership of J. S. Bagg, Arizona-Golconda Metals, Inc. built and equipped a mining plant at the portal of the Peach adit, and began reopening this adit in order to gain access to the 1000 level of the main Golconda workings and

---

1/ Mining Engineer, U. S. Bureau of Mines.
2/ Geologist, U. S. Geological Survey.

to explore the ground between the Peach adit and the main workings. The Company also began rehabilitation work in the Primrose and Prosperity adits. These two adits, like the Peach adit, are north of the main workings and are being opened in the direction of the main workings, but at higher levels than the Peach adit. The Company has lately started metallurgical tests to determine whether the Golconda ores are amenable to roasting, leaching and electrolytic deposition.

The Golconda vein is mostly in a gneissic granite that is part of an extensive Precambrian complex. The vein strikes N 40° W and dips 50 to 70 degrees NE. It has been opened to a depth of about 1400 feet and for a strike length of at least 3000 feet. Almost all of the ore, however, has come from an interval of about 1200 feet measured along the strike, and from between the surface and the 1100 level. Vein widths are said to range between 2 and 7 feet. Pinching and swelling of the veins along both the strike and the dip is a district habit of the ore.

The main ore mineral is sphalerite, which is far more abundant than galena and chalcopyrite though these are the sources of the lead and copper that has been recovered from the ore. The mineralogical form of the uranium and most of the other rare elements that occur in the ore is unknown. Quartz is the predominant gangue mineral.

No positive information can be given concerning the main parts of the Golconda deposit as the mine is flooded below the 600 level.

The possibility that the deposit continues at depth below the lowest level, that is, the 1400, can draw support only from the fact that the deposit is of the mesothermal type which is known in many cases to have a large vertical extent and from the fact that most workers in the district agree that the deposits there have not been sufficiently explored at depth. On the other hand, the Golconda mine has been opened to a much greater depth than most of the other deposits in the district. There is a possibility also of intersecting an ore shoot with the Peach adit north of the main workings 400 feet below the place where a shoot is shown at the 600 level on old mine maps.

The reserves assignable to this deposit are necessarily based on old mine maps and on other reports. On this basis 40,000 tons of inferred ore is estimated for the lower levels of the main workings, and another 40,000 tons of ore is estimated as potential, or undiscovered ore. Based on production records these reserves should average 14 percent zinc, 1/2 percent lead, 1/2 percent copper, 4 ounces of silver and 1/5 ounce of gold per ton. The grade of the rare elements is much more difficult to estimate. Uranium, in addition to being very erratically distributed, is mostly below 0.10 in grade. Sampling indicates that germanium is less than 0.01 percent and indium between 0.01 and 0.1 percent.

The work proposed by the applicant involved the extension of 3 adits for a total of 3,800 feet, the construction of 2 ore bins, and the installation of a hoist and ore pocket at a total estimated cost of $166,750. Much of this work, in the judgment of the examiners,

would be development rather than exploration. Extension of the Peach adit toward the main workings and dewatering the lower mine levels, provided this did not also involve an expensive rehabilitation program, could be considered legitimate exploration work. The total cost of thus extending the Peach adit is estimated by the examiners at $51,860.

An economic study of the cost of producing metals from the Golconda mine was made because the repayment of the DMEA loan would depend on successful production, and also because J. S. Bagg made it clear to the examiners that he based all of his hopes for the property on the construction of a roast-leach and electrolytic plant to recover an impressive variety of metals from the Golconda ores. The economic study indicated that, assuming the Golconda ores are found amenable to treatment, ore reserves much larger than are probably present at the Golconda mine would be needed to pay for such a plant. If, instead of this plant, the production plan included concentration and shipment to a smelter, smelter returns would be insufficient to pay even the mining costs.

Our recommendation, therefore, is that the request for government aid should be denied.

DMEA-4033, ARIZONA-GOLCONDA METALS, INC.
GOLCONDA MINE (Zinc, Lead)
MOHAVE COUNTY, ARIZONA

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INTRODUCTION

The Defense Minerals Exploration Administration received an application from the Arizona-Golconda Metals, Inc. for aid in an exploration project at the Golconda Mine, Wallapai Mining District, Mohave County, Arizona. The application was received and docketed as DMEA-4033, October 26, 1955. It was reviewed by the Operating Committee and forwarded to the Field Team, Region III, for an examination of the property.

The applicant stated that the project was designed to explore for zinc, lead, copper, gold, silver, germanium, indium, cobalt, cadmium, uranium, bismuth, tantalum and columbium. Proposed work involved the extension of 3 adits for a total of 3,800 feet, the construction of 2 ore bins and the installation of a hoist and ore pocket. Its total cost was estimated at $166,750.00.

The property was examined January 31 and February 1, 1956 by Leonid Bryner, geologist, U. S. Geological Survey, and T. M. Romslo, Mining Engineer, U. S. Bureau of Mines. They were accompanied by Mr. John Sherman Bagg, the applicant's managing engineer.

The Wallapai Mining District has been the subject of numerous published and unpublished reports by Governmental agencies and private parties. Among these reports, one on the Tennessee-Schuylkill Project, Docket DMA-21-50, and one on the Mohave Metal Mining and Reduction Co., Docket DMA 494, have sections on the Golconda mine. Other reports will be cited as used in the present report.

LOCATION AND ACCESSIBILITY

The Golconda mine is about 10 air miles northwest of Kingman, Arizona, a town on U. S. Highways 66 and 93 and the Atchison, Topeka and Santa Fe Railroad (figure 1). It is situated on the applicant's property that is described as being in sections 5 and 6, T. 22 N., R. 17 W., Wallapai Mining District, Mohave County, Arizona. Small portions of the property were found to extend into section 1, T. 22 N., R. 18 W. and section 30, T. 23 N., R. 17 W.

The Golconda mine may be reached from Kingman by driving 11.7 miles northwesterly on U. S. Highway 93 and thence 4.5 miles easterly on a graded road that is signed "Pontiac Mines". The graded road ends near the portal of the Peach adit.

TOPOGRAPHY, PHYSICAL FEATURES AND CLIMATE

The Golconda mine is situated on the western slope and near the crest of the northwesterly-trending Cerbat Mountains. The range is bordered on the west by Sacramento Valley and on the east by the Hualpai Valley. Altitudes on the property range from about 3,800 feet to approximately 5,000 feet. The topography is rugged.

Vegetation is mainly confined to forage grasses and scattered light growths of shrubs and oak trees.

Climatic conditions are favorable for year around mining operations. Summers are pleasant except for short periods of high temperatures during July. Winters are not severe.

Annual precipitation at Kingman is about 11 inches. It consists mainly of heavy summer rainfalls, and light rain and snowfalls that normally occur during the period of December through February.

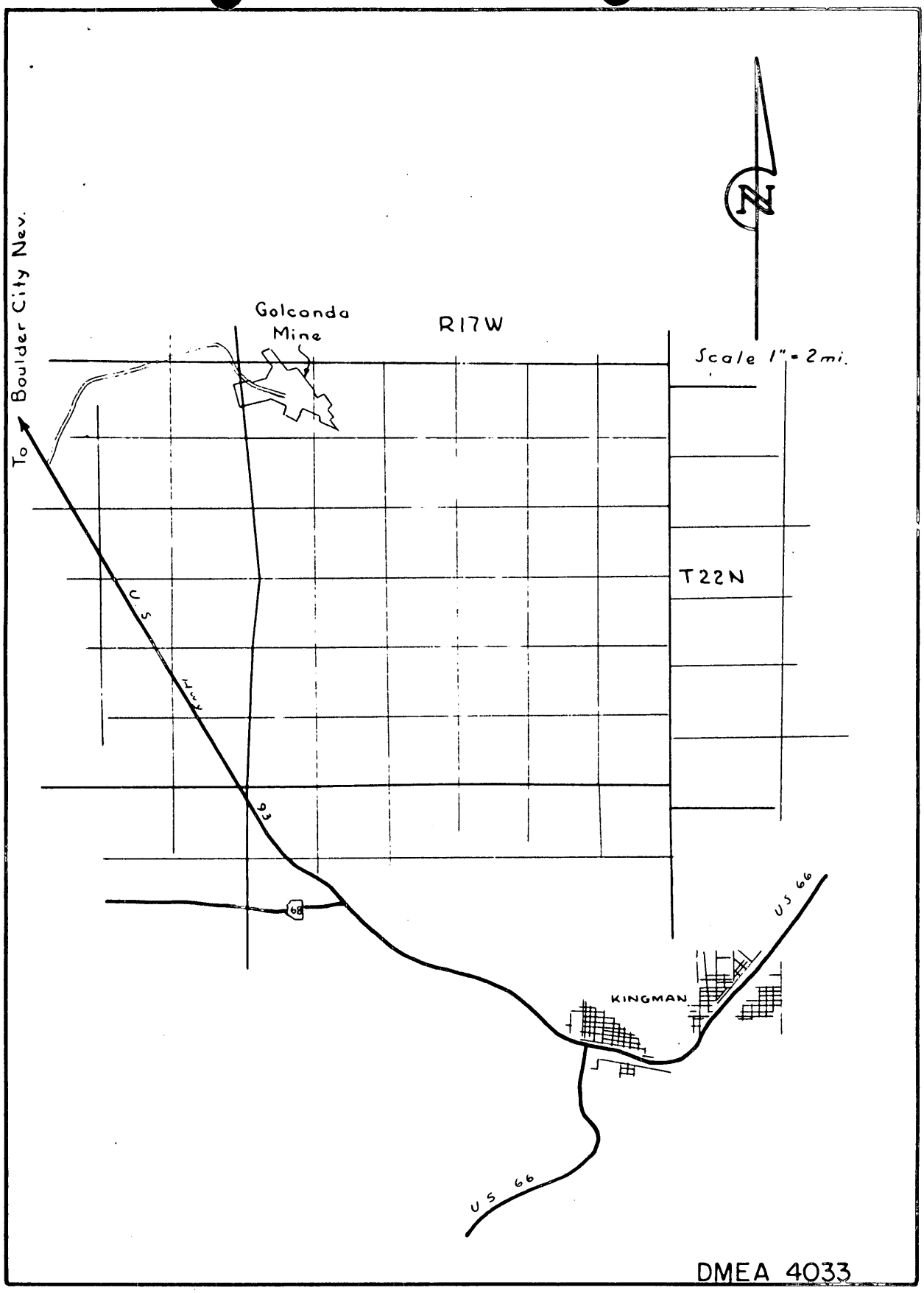

FIG.-1-LOCATION MAP, GOLCONDA MINE
THE ARIZONA GOLCONDA METALS INC.
MOHAVE COUNTY, ARIZONA

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Drainage is westerly via several arroyos to Sacramento Valley. There are no permanent streams in the district. Water for domestic and stock raising purposes is obtained from drilled wells. Mine workings generally furnish sufficient water for small operations.

EXTENT AND OWNERSHIP OF PROPERTY

The applicant, Arizona-Golconda Metals, Inc., reportedly holds 10 unpatented claims and is the lessee of 5 patented claims, all located in the group of 21 claims shown on figure 2.

Officers of the Arizona-Golconda Metals, Inc., of 80 Wall Street, New York 5, N. Y. are: John T. MacEvoy, President, Cedar Grove, New York City; Henry Gross, Vice President, 15 Beekman Street, New York City; Fredrick Luhrs, Secretary, 17 John Street, New York City; John C. Foster, Treasurer, 80 Wall Street, New York City; John S. Bagg, Managing Engineer, P. O. Box 1247, Kingman, Arizona.

Bagg and associates have controlled the property since 1950; first as Mohave Metals Mining and Reduction Corp., then in 1954 as the Uranium Corp. of Arizona, and in 1955 as the Arizona-Golconda Metals, Inc. However, the application contains no record of transfer from the Uranium Corp.

According to John Bagg, easement rights on use of the Peach adit through the Todd and Mariposa claims is not necessary as access through property owned by others is allowed by the Public Use Law.

Mr. Bagg also said that the 5 percent royalty to the Pontiac Mines, Inc., on net ore sales from the 5 patented claims is a gratuity payment to obviate possible future legal action.

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PRESENT STATUS

The principal workings of the Golconda mine are shown on figures 3 and 4. Readily accessible portions of the workings are confined to all of the Primrose adit, 650 feet of the Prosperity adit, all of the Peach adit and about 650 feet of the southeasterly-trending lateral from the end of the Peach adit. All of these workings were inspected by the DMEA examining team.

Mr. Bagg said that 2 of his employees recently entered the inclined Golconda shaft to the water level at close to the 700-foot level. They reportedly found that the shaft was in fair to good condition.

The mine plant, recently erected near the portal of the Peach adit, comprises the following buildings and major equipment:

Buildings - A 3-room 24- by 46-foot structure housing a change room, office, and laboratory; a 20- by 24-foot storage building; a 30- by 40-foot blacksmith shop; and a 12- by 18-foot house occupied by a watchman.

Major equipment - A C-P, 365-C.F.M., Diesel-powered, rotary compressor; a LeRoy 315 Diesel-powered piston-type compressor; a model 12-B, Eimco shovel loader; 3 Copco drills with 2 feed legs and 1 stoper leg; 16 Card mine cars, 20- to 24-cu. ft. capacity; and 1 Tramair Universal locomotive.

HISTORY, PRODUCTION, AND GRADE

The Golconda mine probably was first worked in a small way before 1906. It was then worked at various times, and by numerous operators between the years 1910 to 1942. Almost the entire production dates

from 1908 to 1917. In October 1917, a fire destroyed the mill and most of the surface equipment. During the period 1917 to 1950, a few intermittent and very small scale attempts were made to resume operations.

In 1950, John Sherman Bagg started negotiations for control of the property. He states that the property was acquired by Mohave Metals, Mining and Reduction Corporation and transferred to the Uranium Corporation of Arizona during June 1954. During February 1955 the name of the corporation was changed to the Arizona-Golconda Metals, Inc. Shortly thereafter the corporation built and equipped a mining plant near the portal of Peach adit. Track and pipe then were installed in the Peach and Primrose adits. Since June 20, 1955 work has been continuous on the reopening of the Primrose adit and drifting toward the Golconda shaft from the Peach adit.

Information from the application indicates metallurgical tests are being made to determine if Golconda ores may be satisfactorily reduced by roasting, leaching, and electrolytic deposition. P. E. Landolt, metallurgical consultant, in a report to the applicant, recommended taking 50 to 100 pound samples from each of the main dumps for metallurgical tests. According to Mr. Bagg, the samples comprising ore specimens from the dumps, were shipped for testing under the supervision of Mr. Landolt. Mr. Landolt also recommended that the property be examined by a competent mining engineer.

Mr. Frank A. Ayer, carried out the requested examination. His report was made a part of the application. The report contained data on potential reserves, plans for opening of the mine, and an estimate

of recoverable values by the proposed method of concentration. In the conclusion of the report he said "The plans for opening the mine on the different levels for obtaining reliable samples for metallurgical tests and for moving into production if samples and recoveries are favorable, appear sound."

The total production of the Golconda mine from 1901 to 1948, according to Dings[1/], was as follows:

Zinc	56,226,020 pounds
Lead	2,031,719 pounds
Copper	354,703 pounds
Silver	510,180 ounces
Gold	20,752 ounces

Production for the years 1915, 1916, and the first 9 months of 1917 is summarized by Wanvig[2/] as follows:

Zinc	31,175,906 pounds
Silver	385,532 ounces
Gold	17,498 ounces

This came from 38,658 dry tons of concentrates. These concentrates, however, were partly derived from mined ore and partly by the treatment of old tailings. According to Wanvig, superintendent when the mine shut down in 1917 due to a fire, crude ore mined during the last nine months of operation averaged 14.3 percent zinc. No other data on the grade of mined ore is given in his report.

1/ Dings, McC. D., 1951, The Wallapai mining District, Cerbat Mountains, Mohave County, Arizona: U. S. Geol. Survey Bull. 978-E, p. 147.

2/ Wanvig, J. D., Unpublished report to Mr. C. B. Bell, March 28, 1919.

The smelter shipments for the nine months of 1917, for 11,735 dry tons of concentrates, are given by Wanvig as follows:

Zinc	42.12%
Gold	0.57 oz/ton
Silver	12.70 oz/ton
Iron	9.93%
Manganese	0.66%
Insoluble	12.13%
Lead	1.38%
Copper	1.33%

From these values as well as from his figure of 3.49 as the concentration ratio for ore, and from his figure of 87.5 percent as the recovery, it is possible to derive the approximate content of other metals in the ore before treatment. The reason these calculated figures are only approximate is that the concentrates shipped to the smelter were derived from old tailings as well as from mined ore, and it is assumed that the grade of concentrates from both sources is the same. Also it is assumed that Wanvig's percent recovery and concentration ratio apply to other metals besides zinc.

The calculated values for the important metals of the ore, derived from the above figures, are as follows:

Zinc	13.8%
Gold	0.19 oz/ton
Silver	4.16 oz/ton
Lead	0.45%
Copper	0.43%

The calculated value for zinc checks pretty closely with the heads value of 14.3%. The ore of this estimated grade probably came from the lower parts of the mine and most likely represents the grade of ore that might be obtained by further mining of the deposit.

AEC sampling of the Prosperity and Primrose adits gave results that ranged between 0.005 and 0.138 percent U_3O_8. Out of 13 samples, however, only two assayed above 0.10. The location and grade of each sample is given in figures 5 and 6. The low grade and limited distribution of uranium values indicates that the deposit is subcommercial in its uranium content.

Of the rare elements included in the application, the applicant seems to base most of his hopes on germanium and indium. In order to check on these two elements in the deposit, Romslo took a sample of the jig tailings pile and a sample made up of a composite of hand specimens of zinc ore from the dump. The following tests were run on these two samples as described in the report below by LaMar G. Evans of the U. S. Bureau of Mines.

> "Herewith are the results of chemical and spectrographic analyses on heavy mineral concentrates prepared from a jig tailing and a composite of selected hand specimens from the Golconda dump. The samples were submitted on February 2, 1956 by L. Bryner, U. S. Geological Survey, in connection with DMEA project 4033.
>
> "The two samples were dry crushed and ground to minus 100 mesh and then deslimed in water. The sand fractions were separated at a specific gravity of 2.90 in acetylene tetrabromide. Results of the heavy liquid separations are as follows:

Sample	Product	Weight percent
No. 12784A (jig tailings)	Slime	45.5
	Sand float	50.4
	Sand concentrate	4.1
	Composite	100.0
No. 12784B (composited hand specimens	Slime	53.0
	Sand float	17.9
	Sand concentrate	29.1
	Composite	100.0

"The sand concentrates which consisted of sulfides and iron oxides were then analyzed for their base and rare metal content as shown in the following table.

Element	Analysis, percent No. 12784A Sand concentrate	Analysis, percent No. 12784b Sand Concentrate
Zn	30.10	49.40
Pb (wet chemical analysis)	1.60	0.68
Cu	0.88	1.82
In	0.01-01	0.01-0.1
Ge (semi-quantative	<0.01	<0.01
Cd spectrographic	0.1-1.0	0.1-1.0
Co analysis)	0.01-0.1	0.01-0.1
Bi	0.01-0.1	0.01-0.1
U_3O_8 (Radiometric)	<0.01	<0.01

"From the chemical and spectrographic analysis it appears that the value of this ore is represented by its zinc, lead and copper content.

"The rare metal content of the concentrates is low. The only other elements of possible value would be cadmium and indium if they occur in the maximum quantity indicated by the semi-quantitative spectrographic analysis. These rare metals are recovered as by-products from lead and zinc smelting and at present are produced in greater quantities than can be consumed. If demands exceed production, ample higher grade ores than this are available."

The applicant submitted two analyses for these elements. One by Ledoux & Company (No. 726573, Sept. 17, 1955) was of a sample from 18 inches of the Golconda vein in the Peach drift. This sample was analyzed spectrographically with the following results:

Indium ———— Traces less than 0.002%
Germanium ——— Not detected

The other sample was not identified by the applicant except to say that it was submitted by a Mr. H. B. Lawrence (deceased) for the Pontiac Mines, Inc. The spectrographic analysis by John Herman Laboratory is dated February 4th, 1939, and shows:

Indium ———— 0.1%
Germanium ———— 0.01 to 0.1%

The Ledoux analysis and the U. S. Bureau of Mines analysis are probably the most reliable of the three.

The application besides including zinc, lead, copper, silver, gold, uranium, germanium, and indium also includes cobalt, cadmium, bismuth, tantalum, and columbium. The application contains a single spectrographic analysis of doubtful origin as the only evidence for the presence of the minerals in this last group, with the exception of columbium and tantalum, for which no evidence whatever is offered. Consequently the examiners believe they have ample justification for not investigating the complete list of elements contained in the application. The inclusion or omission of these elements in the investigation would not affect the overall conclusions.

GENERAL GEOLOGY

The host rocks in the Wallapai mining district are chiefly granites, gneisses, schists, and amphibolite of Precambrian age. Throughout the district the gneissic and schistose structures strike generally northeast and dip steeply either to the northwest or to the southeast. The rocks are intruded throughout a large part of the district by the Ithaca Peak granite which may be either Mesozoic[1/] or Tertiary[2/] in age. Quoting Dings[3/]:

> "The chief ore deposits of the Wallapai district occur in veins along fissures in all the rock types . . . . The source of the vein-forming solutions is believed to have been the magmatic reservoir of the granite stock (Ithaca Peak granite) . . . . The veins in the district are classed as mesothermal."

1/ Op. cit. pp. 131-132.
2/ Thomas, B. E., 1949, Ore deposits of the Wallapai district, Arizona: Economic Geology, vol. 44, p. 667.
3/ Op. cit. p. 139.

GEOLOGY OF THE GOLCONDA MINE

The Golconda vein and the veins associated with it are mostly in a gneissic granite. This rock appears to be more competent than surrounding parts of the Precambrian complex. Possibly this difference accounts for the persistence of the Golconda vein, and the presence of open cavities in it. Several dike-like, outlying bodies of the Ithaca Peak granite crop out in the immediate vicinity of the Golconda mine. These bodies have an attitude very similar to that of the Golconda vein and possibly were intruded in the same fissure system as that occupied by the vein. Even more closely associated with the vein than the granite are numerous small bodies of diabase that occupy the same fissure as the vein.

Dings, in his description of the district mineralogy, writes[1/]:

> "Excluding gangue minerals, the most abundant of the primary minerals are pyrite, sphalerite, galena, and chalcopyrite. Other minerals include arsenopyrite, proustite, molybdenite, and argentite. In addition to those listed, Bastin has recognized tennantite, pearceite, and polybasite. Gangue minerals are quartz, calcite, manganiferous siderite, and rarely rhodocrosite.
>
> "Quartz, usually accompanied by varying amounts of pyrite, is by far the most abundant gangue mineral. Most of the quartz is fine-grained and milky to gray in color. Some is of the chalcedonic variety. In many places along the veins small vugs are lined with quartz crystals. In a few places the veins show a poorly defined comb structure, but the quartz is generally massive and commonly fractured and recemented by later quartz."

The more abundant minerals mentioned by Dings were recognized at the Golconda mine. A preponderance of sphalerite over galena also is apparent at the mine. In fact a specimen from a spur of

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1/ Op. cit. p. 142.

the Golconda vein on the 1000 level near the Oro Plata shaft contains mainly sphalerite with small amounts of pyrite, but no recognizable galena.

AEC geologists[1/] recognized no primary or secondary uranium minerals, but believe uranium is present in the form of uraninite, and that significant amounts of it generally are accompanied by high zinc values. Whatever the form of the uranium, it appears likely that it is only locally present in the zinc ore shoots of the Golconda mine. The reasons for believing this are as follows:

1) Even in the small part of the deposit that is accessible, AEC sampling showed great variation in the grade and distribution of uranium,

2) Dump samples taken during the examination and representing ore from the main part of the deposit contained no detectable uranium. Though leaching may have removed some uranium from this dump material it is unlikely that all the uranium would have been removed,

3) The probability that uranium was introduced after the main period of metallization and after fault movement along the Golconda vein makes it likely that its distribution is somewhat different from that of the base metals.

Dings[2/] and other observers recognize in the district an early stage of mineralization characterized by quartz and pyrite, a second stage, during which the fissures were re-opened and the valuable minerals deposited, a third stage with minor re-opening in which quartz was deposited as narrow veinlets, and a final stage which

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1/ Hart, O. M. & Hetland, D. L., 1953, Preliminary report on uranium-bearing deposits in Mohave County, Arizona, RME-4026, pp. 31, 33, and 47.

2/ Op. cit. p. 43.

produced gouge and quartz breccia and some, but very little, additional mineralization. The AEC geologists write[1]:

> "Brecciation and porosity of the veins appear to be controlling factors in the concentration of uranium minerals from the ore-bearing solutions."

If this last observation is true, it appears that the uranium was introduced during the final stage of mineralization after the introduction of the zinc, lead, and precious metals, or else by later leaching from above.

The mode of occurrence of the indium is not known, but it is believed to be closely associated with the zinc.

The workings of the Golconda mine and the gross features of the vein system are shown in figures 3 and 4. The Golconda vein crops out at elevations of 4,500 to 4,960 feet along the flank of a steep, northwesterly-trending ridge in the Cerbat Mountains. Most of the production of the mine has come from this vein. The strike is N 40° W and the dip from 50 to 70 degrees NE. The steepest recorded dip is at the surface, and the flattest dip was observed at the north end on the 1000 level. The level map (fig. 3) indicates that the strike of the Golconda vein becomes progressively more westerly as the vein is followed from south to north. The Tub vein lies west of the Golconda vein and is more or less parallel to it. Judging from the level map the two veins intersect south of the Golconda shaft, and the Tub vein curves to the east as it is followed north from its intersection with the Golconda vein. The Blackfoot vein lies east of the Golconda vein and more or less parallels the Golconda. The comparatively small size

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1/ Hart and Hetland, p. 5.

of the workings on the Blackfoot suggest that it contained a much smaller deposit than the Golconda vein and was worked to only a comparatively shallow depth. The Golconda vein is traceable for a horizontal distance of over 3,000 feet and at the Golconda shaft it has been followed downdip for about 1,400 feet. According to Dings[1/] the vein ranges in thickness from 2 to 7 feet. Near its north end the Golconda vein splits into several branches. Just south of the Oro Plata shaft (fig. 3), where present drifting is underway, the Golconda vein has two small northerly-trending spurs 4 to 20 inches thick with a few inches of sphalerite in them. The Primrose vein, represented by the Primrose adit in figure 3, probably represents another northerly spur of the Golconda vein. The Golconda vein itself, where it has been cut by present drifting, contains only trace amounts of sphalerite and consists mainly of gouge. Some of the details of the Primrose vein and the north end of the Golconda vein in the Prosperity adit are shown in the AEC maps (figs. 5 and 6).

The presence of a large shoot within the Golconda vein is suggested by the distribution of workings on the level map (fig. 3) and the stope map (fig. 4). Also old stope maps in the possession of J. S. Bagg show an oreshoot on the Golconda vein between the main Golconda workings and the Big Bethel adit (fig. 3). According to Bagg some stoping was done in this shoot from the 600 level. Wanvig described the habit of ore bodies within the Golconda shoot, or within what he calls the "ore zone". He wrote[2/]:

> "The fact that these ore bodies are usually continuous in the ore zone and have only local pinches, is the reason that the entire ore zone is eventually stoped out in the operation above each level."

1/ Op. cit. p. 154.
2/ Unpublished report to Mr. C. B. Bell, March 28, 1919.

Pinching and swelling of the veins along both the strike and the dip is a district habit that has been noted by other observers.

Dings[1] describes the structure of the veins in the Wallapai district as "irregularly massive or crudely banded by the arrangement of the sulphides." Not enough of the Golconda vein was seen to determine whether this description applies to it. Large-scale zoning of the sulphides also has been recognized in the district but apparently is not an outstanding feature of the ore deposits. Assuming that the sphalerite represents a higher-temperature phase than does the galena, it is probable that sphalerite rather than galena will continue to be the dominant valuable mineral at depth in the Golconda mine.

Although oxidation apparently has been an important ore-forming process in the district, the present main workings of the Golconda mine are below the zone of oxidation.

There is very little information available on structural control of the ore, or on its possible persistence in depth. Regarding structural control, Dings[2] refers to the work of two other geologists in the district as follows:

> "Garrett (1938, p. 118) states that in the Tennessee mine ore shoots tend to occur where the vein has changed to a more westerly strike than normal. Later work in the mine supports this generalization. Shrader (1909, p. 51) states that many of the ore shoots coincide with intersections or forkings of the veins. Distinct vein intersections, however, are rare. Many of the forks are enriched, but many of them have lower grade ore than average."

Thomas, referring to district habit of the ore, writes:[3]

> "The paucity of sizable ore bodies might be due in part to the strong gouge filling of many veins."

1/ Op. cit. p. 143.
2/ Op. cit. p. 144.
3/ Op. cit. p. 693.

Vein intersections as well as gouge in the vein both may have a bearing on the distribution of ore at the Golconda mine. Where the Golconda vein could be observed on the 1000 level just south of the Oro Plata shaft, it is about 5 ft. wide, almost entirely gouge, and almost devoid of sulphide mineralization. This, however, is several hundred feet north of the nearest known oreshoot. Some mining was done at the intersection of the Golconda and Tub veins but the nature of the ore at this vein intersection compared to the ore in other parts of the mine is not known. Also, the oreshoot just south of the Big Bethel adit (fig. 3) appears to coincide in position with the projected intersection of the Primrose vein with the Golconda vein.

The maximum known vertical extent of individual deposits in the district is in the Golconda and Tennessee-Schuylkill mines, where depths of about 1400 feet have been attained. Most of the other deposits have been worked to much shallower depths than this, presumably because in the early days the miners mostly sought just silver and gold in the oxidized zone. Most workers in this area agree that the deposits have not been sufficiently explored in depth for base metals. This, combined with the mesothermal character of the deposits, offers some incentive for exploration at depth.

RESERVES

The reserves assignable to this deposit are necessarily based on old mine maps and on other reports. Because of this, reserve estimates only of the inferred and potential classes seem justified.

John D. Wanvig states in his private report that the mine has produced about 20,000 tons for each 100 feet of depth below the 700

level. This figure is in fair agreement with the known production of the mine. On the basis of 20,000 tons per level, Wanvig estimated that 60,000 tons of milling grade ore remained between the 1100 and 1400 levels when the mine closed down. Apparently he believed that the deposit persisted to the 1400 level without diminution of volume or grade. On the other hand, he attributes a certain unfavorable aspect to the 1250 level without stating what this unfavorable aspect is. But against this unattractiveness of the 1250 level he cites:

> "the fact that about 15 feet below the . . . . level a body of high grade was entered in the shaft which opened to a width of 6 feet of solid high grade ore and continued for about 60 feet in depth,"

and also the

> "singular fact that development headings all told at the Golconda were rarely attractive or conducive of any great expectation of ore returns and yet the mine has produced fully 70,000,000 pounds of zinc with gold and silver values."

Wanvig's report sounds reliable though somewhat on the optimistic side. We would be inclined, therefore, to place the inferred reserves between the 1100 level and 1400 level at about 40,000 tons, averaging about 14% zinc, ½% lead, ½% copper, 4 oz./ton silver, and 1/5 oz./ton gold. If the mine were reopened and the stopes made accessible some of this inferred tonnage might be transferred to the indicated and measured categories.

There is a geologic possibility of the ore in the main workings continuing below the 1400 level. There is also the possibility of a downward extension, below the 600 level, of the ore shoot shown on old maps north of the main workings and south of the Big Bethel adit. Such ore is not included in the above estimate because its existence is based on speculation rather than any geologic evidence. If

exploration were successful, however, the inferred reserves based on such findings might amount to another 40,000 tons. Our reserve estimates are considerably lower than those made for the Golconda mine by Faick and Bromfield in their examination report on the Tennessee-Schuylkill Project (DMA 21-50). The reason for this difference lies more in a stricter use of the term "inferred reserves" rather than in any fundamental disagreement as to the geology and potentialities of the property.

PROPOSED EXPLORATORY AND PRODUCTION PLANS

Proposed Explorations of Application

The applicant asked assistance in exploration work costing $166,750 as follows:

1. 300 feet of drifting from Prosperity adit on Golconda 600-foot level, plus ore bin ———— $9,000.00
2. 500 feet of drifting from Primrose adit on Golconda 500-foot level, plus ore bin ———— 16,000.00
3. 3,000 feet of drifting on or adjacent to the Golconda vein from Peach adit to connect with 1,000-foot level of Golconda shaft ———— 90,000.00
4. Install hoist and ore pockets on 1000 level and, if necessary, sink new shaft from 1000 to 1400-foot level———— 30,000.00
5. Contingencies, 15% of above ———— 21,750.00

Eligibility of Proposed Explorations

Item 1, 300-foot extension of Prosperity adit and construction of ore bin.

This work is not eligible for aid. It involves reopening of a section of ground in which no new ore can be expected. Mr. Bagg said the object of the work was to make accessible a site for the pumping of mine water for use in the proposed concentrator. The proposed bin is for ore that may be found in the old workings.

Item 2, 500-foot extension of Primrose adit plus ore bin.

This work is not justified on the basis of the poor showings in the adit and because the applicant's favorable zone at the intersection of the Primrose and Prosperity adits will be encountered by the operator in the Prosperity adit and by work in progress on the 1000-foot level.

Item 3, 3000-foot extension of drift from Peach adit to Golconda shaft.

The exploratory portion of this work is confined to the extension of the drift from its present face to the old mine workings, a distance of about 1,250 feet. This drift would explore for a depth-extension of the ore shoot shown on old maps at the projected junction of the Primrose and Prosperity (Golconda) veins. The present practice of drifting at about 20 feet from the vein seems justified because the vein contains much gouge and would be expensive to follow. However, present testing of the vein by crosscuts at 150-foot intervals should be supplemented by drilling long holes at intervals of about 30 feet. This exploratory plan would comprise an estimated 1,250 feet of drifting, 225 feet of crosscutting (9 at 25 feet each) and 900 feet of drilling in 36 25-foot long-holes.

Continuation of the Peach adit an additional 700 feet south to the Golconda shaft probably would be necessary to make this adit useful as a haulageway for ore. This is because the adit is being driven without the survey that would be necessary to tie the adit at grade with the 1000 level of the old workings. A short raise or winze to the 1000 level from the Peach adit might be sufficient to gain access to the old workings for inspection purposes and to allow an estimate of the possibilities for further exploration. If, on the other hand, the 1000 level is caved and inaccessible then it is likely that much of the old workings are inaccessible and rather expensive rehabilitation of the mine would be necessary in order to investigate its potentialities at depth. The writers doubt whether the lower parts of the deposit hold enough promise to justify such expense.

Item 4, Install hoist and ore pockets on 1000 level and, if necessary, sink new shaft from 1000 to 1400 level.

This work probably is not eligible for aid as it too is designed to make ore reserves accessible.

If the mine workings are made accessible it is possible that other exploratory targets could be developed. One of these possible targets would be a depth-extension of the Tub vein. An examination of the Tub vein on the 500 and 600 level would indicate the advisability of diamond drilling for the vein from the Golconda workings. Another possible target would be a depth-extension of the Golconda vein that could be tested by diamond drilling from a crosscut.

Estimated Cost of Eligible Exploration
(Item 3 of page 19)

Drifting and crosscutting - The following estimated cost of about $34.00 a foot is believed to be more realistic than the applicant's cost of $30.00 a foot as it is based on actual costs of the present efficient operation:

	Cost per 5 feet	Cost per ft.
Supervision 1/	$ 5.00	$1.00
Labor 2/	107.50	21.50
Powder, caps, etc.	15.00	3.00
Ventilation pipe	3.50	0.70
Air and water pipe	5.00	1.00
Track	11.00	2.20
Fuel, greases & repairs	10.00	2.00
Depreciation 3/	13.20	2.64
	$170.20	$34.04

1/ 1/4 time for supervisor at $500.00 a month.

2/ 5-man crew averaging 5 feet advance per working day. Average daily wages plus taxes of $21.50 per man, is based on bonus system.

3/ Depreciation costs are based on complete monthly advance of 125 feet and depreciation of the following equipment in 5 years:

1	365-C.F.M. diesel powered compressor	$10,500.00
1	12B Eimco shovel loader	3,000.00
1	Universal trammer	1,800.00
12	Mine cars @ $250.00 each	3,000.00
2	Copco pneumatic drills complete at $600 each	1,200.00
1	Copco bit grinder	320.00
		$19,820.00

Long hole drilling - Cost per foot should be about as follows:

Labor 1/	$0.70
Taxes	0.10
Equipment & Supplies	0.65
Miscellaneous	0.20
	$1.65

1/ 2 men at $14.00 per day will be expected to show a daily advance of 40 feet.

Assays - The number of samples for assay is unpredictable but might total 45, one from each of the 9 crosscuts and 36 long holes. Cost of assaying the 45 samples for zinc, lead, copper, gold and silver would be about $5.00 each or a total of $225.00.

A summary of estimated costs follows:

Drift and crosscuts 1,475 feet @ $34.00 a foot	$50,150.00
Long holes, 900 feet @ $1.65	1,485.00
Assaying	225.00
Total	$51,860.00

Production Plan

The mine manager, J. S. Bagg, appears to have an efficient and clean operation at the Golconda mine. His overall plans, however, though not part of the DMEA application, do not appear to be sound. As the success or failure of the mining operation will be affected by the overall plans and would in turn affect DMEA interests, these plans will be briefly reviewed. According to Mr. Bagg, a 100-ton

Humphrey Spiral mill will shortly be built on the property for treatment of jig tailings from the old mill and Golconda ore. Concentrates will be trucked to a reduction plant which will be built at a selected site near Kingman. The first unit of the reduction plant will be a roasting plant which will yield sulphuric acid as a by-product. Calcines from the roaster then would be treated in a leaching unit and the resulting solutions would be treated in an electrolytic plant. End products at the plant would be electrolytic zinc and copper, and gold and silver by cyanidation of sludges. Regarding other products (germanium, indium, and uranium) Mr. Ayers says, "We will not know what percent of these valuable minerals will be recovered until metallurgical tests are run on many representative samples of mine ore and accurate assays of each are made."

Essentially Bagg's expressed objective is to set up a plant that will mill and refine ore from the entire district and recover not only the base metals, but also germanium, indium, uranium, and possibly other rare metals. He visualizes the Golconda mine only as the opening wedge in a profitable metallurgical enterprise. To cover the expense of building such a plant Bagg apparently assumes the existence of the necessary ore reserves in the district. But exploration in the district has been too meager either to prove or to disprove such reserves, and a justifiable exploratory program for the Golconda mine could not sufficiently improve the overall reserve picture to warrant the outlay for such a plant. If the plant already existed at the Golconda mine then the ore could be economically mined and treated. Lacking such a

plant means having to face smelting and shipping costs that very likely would be prohibitive to the economic operation of the Golconda mine. The chances are, therefore, that even if the DMEA project discovered a significant tonnage of ore, this ore would not be mined for many years, and perhaps not at all.

ECONOMIC POTENTIAL

The economic potential of the Golconda mine has been considered on the basis of production by the conventional method and by the applicant's proposed method. The following estimates of costs and value of ore show that each of the production methods would result in an unprofitable operation.

Production by the conventional method would involve mining the ore, concentration of the ore at the property and sale of concentrates to a smelter. This production plan would be unprofitable because estimated smelter returns of $12.89 per ton of ore would be less than anticipated per ton mining costs alone of $15.50.

Cost of production by the applicant's previously outlined plan has been estimated at $36.00 per ton of ore before taxes and unavailable operating costs of the plant for reduction of concentrates. The estimated per ton value of the ore by this production plan would be $33.30, less about $3.33 for royalty payments, or approximately $30.00. The royalty payments would be 5 percent each to the Government and to the Pontiac Mines.

Estimated Mining Costs

M. J. Elsing and L. L. Farnham in their report on the Tennessee-Schuylkill Project, Docket DMA-21-50, estimated that 1951 mining costs at the nearby Tennessee mine would be $15.50 a ton of ore. The Tennessee ground is classed as heavy and requires that the square-set method of mining be used except in a few instances where the cut and fill method is applicable. At the Golconda mine, the ground also probably is heavy and would require mining by the same methods except where narrow veins might be open-stoped. Cost of open-stoping might be a little less than mining by the other methods but the possible reduction in costs probably would be offset by the increase in costs of labor and materials since 1951. On this basis, present mining costs at the Golconda probably would be near $15.50 per ton of ore.

Estimated Cost of Proposed Production Plan

		Per Ton
Mining		$15.50
Concentration, operation only		2.00
Trucking concentrates		1.00
Capital expenditures		
Expenditures to date 1/	$ 70,000.00	
Due on equipment 1/	5,000.00	
Additional before Production 2/	200,000.00	
100-ton Humphrey spiral mill	30,000.00	
30-ton Roaster-acid plant	750,000.00	
20-ton Leaching and electrolytic plant 3/	250,000.00	
Plant site 1/	15,000.00	
	$1,320,000.00	16.50 4/
Overhead		1.00
Total before taxes and other operating costs		$36.00

1/ Costs obtained from Mr. Bagg.

2/ Includes cost of reopening and equipping mine for production.

3/ Estimated minimum cost from Tucson Metallurgical Division, U.S.B.M.

4/ Based on estimated total reserves of 80,000 tons of ore.

Value of Ore

Sale of Concentrates to a Smelter. In estimating the per ton value of the ore it is assumed that the grade of present concentrates would be the same as the concentrates produced in 1917. Present per ton smelter returns, before royalty payments, on such concentrates would be $12.89 a ton of ore based on the following applicable smelter schedule and other reductions:

Gold 57 oz/T 80 percent at $32.21 per ounce	$ 14.688
Silver 12.7 oz/T 80 percent at $0.90 per ounce	9.144
Copper 1.33% 26.6# 65 percent at $0.44 minus $0.065 per pound	6.484
Zinc 42.12 842.4# 85 percent at $0.1223 minus $0.0045 per pound	84.359
	$114.675

Less - Base charge	$58.12	
Freight to El Paso	10.55	
Trucking to Kingman	1.00	69.67
Net smelter value per ton of concentrates		$ 45.00
Value per ton of ore (ratio of concentration 3.49 to 1)		$ 12.89

Sale of products from proposed reduction plant. Mr. Ayers has estimated that concentrates such as those produced in 1927 would show returns of $33.30 per ton of ore, before any credit for germanium, indium and uranium. That little or no credit would be derived from these rare metals is indicated by geologic findings and the previously given Bureau of Mines analysis of jig tailings from the old mill and ore specimens

from the mine dumps. On the basis of these findings it appears that any credit to Mr. Ayers' estimated returns would be confined to sulfuric acid. That a significant credit for sulfuric acid is unlikely is based on the present market price and freight rates. Sulfuric acid sells for $28.00 a ton in California, the principal potential market. Freight rates from Kingman amount to $20.40 a ton of acid.

CONCLUSIONS AND RECOMMENDATIONS

(1) Construction of the proposed elaborate reduction plant would be justified only if the Golconda ores are found amenable to treatment, and if ore reserves on the order of several hundred thousand tons are assured. These reserve requirements, however, are necessarily based on incomplete cost estimates. Reserves of this order of magnitude probably do not exist at the Golconda mine, though that much ore might be found in the district.

(2) In a conventional production plan consisting of mining, concentration of the ore, and shipment of concentrates to a smelter, mining costs alone at the Golconda would exceed smelter returns. Indicative of the present status of mining in the Wallapai district is the fact that the Tennessee-Schuylkill mine has shut down within the past few years and, like practically all the other mines in the district, still is idle.

(3) Tonnages of protore that might be substantiated by exploration and re-opening the mine could be considered significant enough to justify exploration despite economic arguments to the contrary. So because of the possibility of DMEA approval for government aid, an exploration plan

is set forth in this report. This plan rejects as development work much of the proposed program of the applicant.

Our recommendation, however, based on a study of the economic potentialities of the Golconda mine, is that the request for government aid should be denied.

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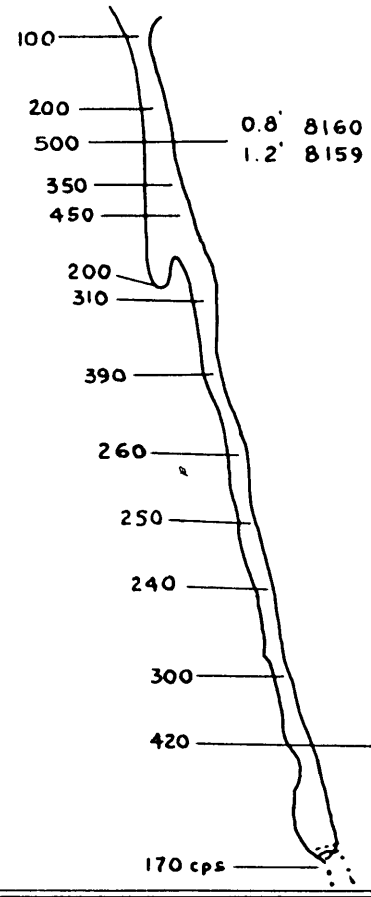
8160	0.025	0.027
8161	0.128	0.075



Scintillometer Survey
Scale 1" = 50'
2 / 10 / 53

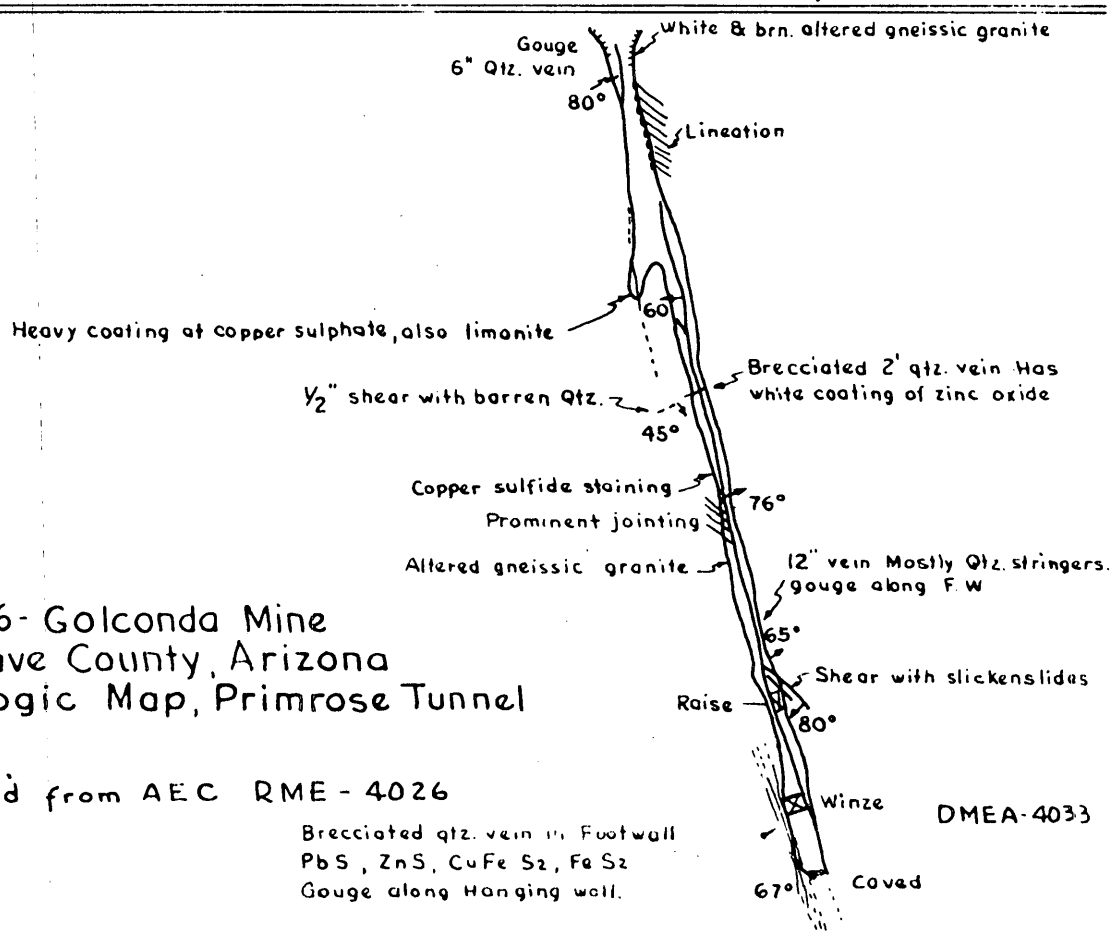


Fig-6- Golconda Mine
Mohave County, Arizona
Geologic Map, Primrose Tunnel

Copied from AEC RME-4026

Brecciated qtz. vein in Footwall
PbS, ZnS, CuFeS2, FeS2
Gouge along Hanging wall.

DMEA-4033

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

March 26, 1956

224 New Customhouse
Denver 2, Colorado

Reviewed

Docket

Memorandum

To: Secretary to the Operating Committee, DMEA

From: Field Team, Region III

Subject: Joint Report of Examination, Docket DMEA 4033 (Lead-Zinc-Copper), Arizona-Golconda Metals, Inc., Golconda Mine, Mohave County, Arizona

Enclosed are the original and three copies of the joint engineering and geologic report on the subject property.

The field examiners concur in the recommendation that the application be denied, largely on the basis of economic potentialities. Information obtained by the examiners came from old maps and old reports since the lower workings are not accessible.

We believe that this application might well be denied without prejudice pending a reexamination of the property when and if the lower mine workings are opened.

DMEA Field Team, Region III

W. M. Traver

E. N. Harshman

Enclosures

Reviewed by
DMEA OPERATING COMMITTEE
4/2/56
(date)

MINERAL DEPOSITS
DMEA
RECEIVED
MAR 22 1956
GEOLOGICAL SURVEY
DENVER, COLORADO

Reviewed by
DMEA OPERATING COMMITTEE

_____
(date)

Box 4126 University Station
Tucson, Arizona

March 14, 1956

TRANSMITTED
MAR 26 1956

Memorandum

To: Executive Officer, DMEA Field Team, Region III

From: W. R. Storms Through E. H. Harshman
J. M. Faick

Subject: DMEA Docket 4033, Examination report of the Golconda Mine, Arizona-Golconda Metals, Inc., Mohave County, Arizona.

Transmitted herewith are the original and 10 copies of an examination report on the above subject property, which has been prepared by T. M. Romalo, U. S. Bureau of Mines, and Leonid Bryner, U. S. Geological Survey. This report is longer and much more comprehensive than is normally submitted by DMEA because of the complex and involved nature of the application. This is the third application received by DMEA on the Golconda mine; it was previously examined as part of DMA-494, and DMA 50-81, in 1951, at which time the application was denied, because it was shown the mine could not be operated on the existing ore reserves, which are of submarginal grade. Application DMA-494 and the present application are similar in at least 3 respects: 1) the property is under essentially the same management; 2) the reserves are essentially the same order of magnitude; 3) the production plans are similar and depend on unique and involved metallurgical processes.

J. S. Begg, manager, bases all hope for the success of the venture on construction and operation of a roast-leach and electrolytic plant for the recovery of zinc and several other metals.

Romalo re-appraised the possibility of operations by conventional methods and examined the feasibility of the operation's plans. In both cases his estimated costs of production exceed the value of the ore. The Golconda ores are not yet known to be amenable to the proposed roast-leach treatment, and the limited reserves do not justify the cost of the necessary plant.

Another unfavorable aspect of the application is the fact the company has had 3 names since J. S. Bagg organized it in 1950 or 1951, and this may indicate unfavorable promotional aspects within the Company. Furthermore, entrance to the mine through the Peach adit may be illegal, and property rights appear clouded, although these probably could be clarified. Competence of the local manager was questioned in a letter submitted in June 1951, in connection with docket DMA-494, and this remains unchanged.

In favor of the application is the reasonably conservative estimate of minable grade ore on the old Golconda property. To seek this ore a small part of the project would be legitimate exploration if it were not dependent upon economics and upon metallurgical treatment of the ore by unproven processes.

The fact that the Golconda ores have been shown to be submarginal, and that the venture is involved in complex and expensive metallurgical processes leads to the conclusion that this project is not to the best interests of the Government. We therefore concur with Romalo and Bryner in recommending denial of the application.

Walter R. Storms

W. R. Storms

John N. Faick

J. N. Faick

cc: Executive Officer (10)
Storms (1)

UNITED STATES
DEPARTMENT OF THE INTERIOR
DOUGLAS McKAY, SECRETARY

DEFENSE MINERALS EXPLORATION ADMINISTRATION

REPORT OF EXAMINATION BY FIELD TEAM
REGION III

TRANSMITTED

MAR 26 1956

DMEA-4033, Arizona-Golconda Metals, Inc.

Golconda Mine (Zinc, Lead)

Mohave County, Arizona

T. M. Romslo, Mining Engineer
U. S. Bureau of Mines

Leonid Bryner, Geologist
U. S. Geological Survey

Reviewed by
DMEA OPERATING COMMITTEE

_____
(date)

March 1956

TRANSMITTED

MAR 26 1956

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

By T. H. Romslo[1] and Leonid Bryner[2]

The Defense Minerals Exploration Administration received an application from Arizona-Golconda Metals, Inc. for aid in exploring for zinc, lead, copper, gold, silver, germanium, indium, cobalt, cadmium, uranium, bismuth, tantalum and columbium at the Golconda Mine, Wallapai Mining District, Mohave County, Arizona. The application was received and docketed as DMEA-4033, October 26, 1956.

The total production from the Golconda mine from 1901 to 1948 was as follows:

Zinc ———	56,286,080	pounds
Lead ———	2,031,719	"
Copper ———	154,703	"
Silver ———	510,180	ounces
Gold ———	20,752	"

Most of this production was during the years 1915, 1916, and 1917. In October 1917 a fire destroyed the mill and most of the surface plant. Since then, the mine has remained essentially inactive though a few intermittent and small-scale attempts were made to resume operations. In 1955, under the managership of J. S. Bagg, Arizona-Golconda Metals, Inc. built and equipped a mining plant at the portal of the French adit, and began reopening this adit in order to gain access to the 1000 level of the main Golconda workings and

---

1/ Mining Engineer, U. S. Bureau of Mines.
2/ Geologist, U. S. Geological Survey.

to explore the ground between the Peach adit and the main workings. The Company also began rehabilitation work in the Primrose and Prosperity adits. These two adits, like the Peach adit, are north of the main workings and are being opened in the direction of the main workings, but at higher levels than the Peach adit. The Company has lately started metallurgical tests to determine whether the Golconda ores are amenable to roasting, leaching and electrolytic deposition.

The Golconda vein is mostly in a gneissic granite that is part of an extensive Precambrian complex. The vein strikes N 40° W and dips 50 to 70 degrees NE. It has been opened to a depth of about 1400 feet and for a strike length of at least 3000 feet. Almost all of the ore, however, has come from an interval of about 1200 feet measured along the strike, and from between the surface and the 1100 level. Vein widths are said to range between 2 and 7 feet. Pinching and swelling of the veins along both the strike and the dip is a distinct habit of the ore.

The main ore mineral is sphalerite, which is far more abundant than galena and chalcopyrite though these are the sources of the lead and copper that has been recovered from the ore. The mineralogical form of the uranium and most of the other rare elements that occur in the ore is unknown. Quartz is the predominant gangue mineral.

No positive information can be given concerning the main parts of the Golconda deposit as the mine is flooded below the 500 level.

The possibility that the deposit continues at depth below the lowest level, that is, the 1400, can draw support only from the fact that the deposit is of the mesothermal type which is known in many cases to have a large vertical extent and from the fact that most workers in the district agree that the deposits there have not been sufficiently explored at depth. On the other hand, the Coleman mine has been opened to a much greater depth than most of the other deposits in the district. There is a possibility also of intersecting an ore shoot with the Punch adit north of the main workings 400 feet below the place where a shoot is shown at the 600 level on old mine maps.

The reserves assignable to this deposit are necessarily based on old mine maps and on other reports. On this basis 40,000 tons of inferred ore is estimated for the lower levels of the main workings, and another 40,000 tons of ore is estimated as potential, or undiscovered ore. Based on production records these reserves should average 14 percent zinc, 1/2 percent lead, 1/2 percent copper, 4 ounces of silver and 1/5 ounce of gold per ton. The grade of the rare elements is much more difficult to estimate. Uranium, in addition to being very erratically distributed, is mostly below 0.10 in grade. Sampling indicates that germanium is less than 0.01 percent and indium between 0.01 and 0.1 percent.

The work proposed by the applicant involved the extension of 3 adits for a total of 3,800 feet, the construction of 2 ore bins, and the installation of a hoist and ore pocket at a total estimated cost of $166,750. Much of this work, in the judgment of the examiners,

would be development rather than exploration. Extension of the Peach adit toward the main workings and dewatering the lower mine levels, provided this did not also involve an expensive rehabilitation program, could be considered legitimate exploration work. The total cost of thus extending the Peach adit is estimated by the examiners at $51,860.

An economic study of the cost of producing metals from the Golconda mine was made because the repayment of the RFCi loan would depend on successful production, and also because J. S. Bagg made it clear to the examiners that he based all of his hopes for the property on the construction of a roast-leach and electrolytic plant to recover an impressive variety of metals from the Golconda ores. The economic study indicated that, assuming the Golconda ores are found amenable to treatment, ore reserves much larger than are probably present at the Golconda mine would be needed to pay for such a plant. If, instead of this plant, the production plan included concentration and shipment to a smelter, smelter returns would be insufficient to pay even the mining costs.

Our recommendation, therefore, is that the request for government aid should be denied.

DMA-4033, ARIZONA-COLCONDA METALS, INC.
COLCONDA MINE (Zinc, Lead)
MOHAVE COUNTY, ARIZONA

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INTRODUCTION

The Defense Minerals Exploration Administration received an application from the Arizona-Golconda Metals, Inc. for aid in an exploration project at the Golconda Mine, Wallapai Mining District, Mohave County, Arizona. The application was received and docketed as DMEA-4033, October 26, 1955. It was reviewed by the Operating Committee and forwarded to the Field Team, Region III, for an examination of the property.

The applicant stated that the project was designed to explore for zinc, lead, copper, gold, silver, germanium, indium, cobalt, cadmium, uranium, bismuth, tantalum and columbium. Proposed work involved the extension of 3 adits for a total of 3,800 feet, the construction of 2 ore bins and the installation of a hoist and ore pocket. Its total cost was estimated at $166,750.00.

The property was examined January 31 and February 1, 1956 by Leonid Brynar, geologist, U. S. Geological Survey, and T. M. Romalo, Mining Engineer, U. S. Bureau of Mines. They were accompanied by Mr. John Sherman Bagg, the applicant's managing engineer.

The Wallapai Mining District has been the subject of numerous published and unpublished reports by Governmental agencies and private parties. Among these reports, one on the Tennessee-Schuylkill Project, Docket DMA-21-30, and one on the Mohave Metal Mining and Reduction Co., Docket DMA 494, have sections on the Golconda mine. Other reports will be cited as used in the present report.

LOCATION AND ACCESSIBILITY

The Golconda mine is about 10 air miles northwest of Kingman, Arizona, a town on U. S. Highways 66 and 93 and the Atchison, Topeka and Santa Fe Railroad (figure 1). It is situated on the applicant's property that is described as being in sections 5 and 6, T. 22 N., R. 17 W., Hallagai Mining District, Mohave County, Arizona. Small portions of the property were found to extend into section 1, T. 22 N., R. 18 W. and section 30, T. 23 N., R. 17 W.

The Golconda mine may be reached from Kingman by driving 11.7 miles northwesterly on U. S. Highway 93 and thence 4.5 miles easterly on a graded road that is signed "Pontine Mines". The graded road ends near the portal of the Peach adit.

TOPOGRAPHY, PHYSICAL FEATURES AND CLIMATE

The Golconda mine is situated on the western slope and near the crest of the northwesterly-trending Cerbat Mountains. The range is bordered on the west by Sacramento Valley and on the east by the Hualpai Valley. Altitudes on the property range from about 3,800 feet to approximately 5,030 feet. The topography is rugged.

Vegetation is mainly confined to forage grasses and scattered light growths of shrubs and oak trees.

Climatic conditions are favorable for year around mining operations. Summers are pleasant except for short periods of high temperatures during July. Winters are not severe.

Annual precipitation at Kingman is about 11 inches. It consists mainly of heavy summer rainfalls, and light rain and snowfalls that normally occur during the period of December through February.

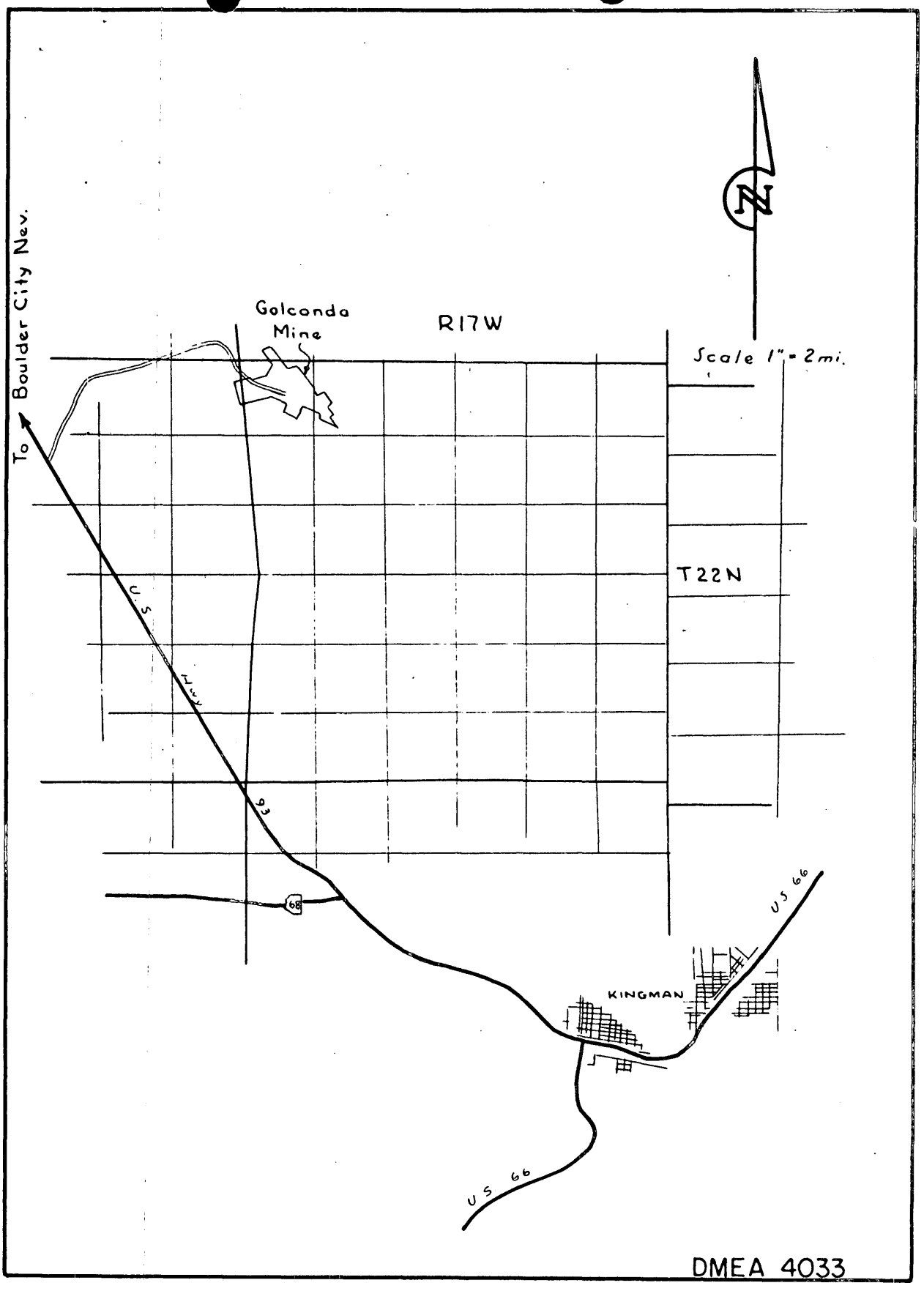

FIG.-1-LOCATION MAP, GOLCONDA MINE
THE ARIZONA GOLCONDA METALS INC.
MOHAVE COUNTY, ARIZONA

Drainage is westerly via several arroyos to Sacramento Valley. There are no permanent streams in the district. Water for domestic and stock raising purposes is obtained from drilled wells. Mine workings generally furnish sufficient water for small operations.

EXTENT AND OWNERSHIP OF PROPERTY

The applicant, Arizona-Colorado Metals, Inc., reportedly holds 10 unpatented claims and is the lessee of 5 patented claims, all located in the group of 21 claims shown on figure 2.

Officers of the Arizona-Colorado Metals, Inc., of 80 Wall Street, New York 5, N. Y. are: John T. Manvey, President, Cedar Grove, New York City; Henry Greene, Vice President, 15 Beekman Street, New York City; Frederick Lehrs, Secretary, 17 John Street, New York City; John C. Foster, Treasurer, 80 Wall Street, New York City; John S. Bagg, Managing Engineer, P. O. Box 1847, Kingman, Arizona.

Bagg and associates have controlled the property since 1950; first as Mohave Metals Mining and Reduction Corp., then in 1954 as the Uranium Corp. of Arizona, and in 1955 as the Arizona-Colorado Metals, Inc. However, the application contains no record of transfer from the Uranium Corp.

According to John Bagg, easement rights on use of the Peach adit through the Todd and Mariposa claims is not necessary as access through property owned by others is allowed by the Public Use Law.

Mr. Bagg also said that the 5 percent royalty to the Pontiac Mines, Inc., on net ore sales from the 5 patented claims is a gratuity payment to obviate possible future legal action.

PRESENT STATUS

The principal workings of the Golconda mine are shown on figures 3 and 4. Readily accessible portions of the workings are confined to all of the Primrose adit, 650 feet of the Prosperity adit, all of the Peach adit and about 650 feet of the southeasterly-trending lateral from the end of the Peach adit. All of these workings were inspected by the BMEA examining team.

Mr. Bagg said that 2 of his employees recently entered the inclined Golconda shaft to the water level at close to the 700-foot level. They reportedly found that the shaft was in fair to good condition.

The mine plant, recently erected near the portal of the Peach adit, comprises the following buildings and major equipment:

Buildings - A 3-room 24- by 44-foot structure housing a change room, office, and laboratory; a 20- by 24-foot storage building; a 30- by 40-foot blacksmith shop; and a 12- by 18-foot house occupied by a watchman.

Major equipment - A C-P, 365-C.F.M., Diesel-powered, rotary compressor; a LeRoy 315 Diesel-powered piston-type compressor; a model 12-B, Eimco shovel loader; 3 Copco drills with 2 feed legs and 1 stoper leg; 16 Card mine cars, 20- to 24-cu. ft. capacity; and 1 Transmir Universal locomotive.

HISTORY, PRODUCTION, AND GRADE

The Golconda mine probably was first worked in a small way before 1906. It was then worked at various times, and by numerous operators between the years 1910 to 1942. Almost the entire production dates

from 1908 to 1917. In October 1917, a fire destroyed the mill and most of the surface equipment. During the period 1917 to 1950, a few intermittent and very small scale attempts were made to resume operations.

In 1950, John Sherman Bagg started negotiations for control of the property. He states that the property was acquired by Mohave Metals, Mining and Reduction Corporation and transferred to the Uranium Corporation of Arizona during June 1954. During February 1955 the name of the corporation was changed to the Arizona-Golconda Metals, Inc. Shortly thereafter the corporation built and equipped a mining plant near the portal of Peach adit. Track and pipe then were installed in the Peach and Primrose adits. Since June 20, 1955 work has been continuous on the reopening of the Primrose adit and drifting toward the Golconda shaft from the Peach adit.

Information from the application indicates metallurgical tests are being made to determine if Golconda ores may be satisfactorily reduced by roasting, leaching, and electrolytic deposition. F. E. Landolt, metallurgical consultant, in a report to the applicant, recommended taking 50 to 100 pound samples from each of the main dumps for metallurgical tests. According to Mr. Bagg, the samples comprising ore specimens from the dumps, were shipped for testing under the supervision of Mr. Landolt. Mr. Landolt also recommended that the property be examined by a competent mining engineer.

Mr. Frank A. Ayer carried out the requested examination. His report was made a part of the application. The report contained data on potential reserves, plans for opening of the mine, and an estimate

of recoverable values by the proposed method of concentration. In the conclusion of the report he said "The plans for opening the mine on the different levels for obtaining reliable samples for metallurgical tests and for moving into production if samples and recoveries are favorable, appear sound."

The total production of the Golconda mine from 1901 to 1948, according to Dings[1], was as follows:

Zinc	56,226,000 pounds
Lead	2,031,719 pounds
Copper	354,703 pounds
Silver	510,180 ounces
Gold	20,752 ounces

Production for the years 1915, 1916, and the first 9 months of 1917 is summarized by Wanvig[2] as follows:

Zinc	31,175,906 pounds
Silver	385,532 ounces
Gold	17,498 ounces

This came from 38,638 dry tons of concentrates. These concentrates, however, were partly derived from mined ore and partly by the treatment of old tailings. According to Wanvig, superintendent when the mine shut down in 1917 due to a fire, crude ore mined during the last nine months of operation averaged 14.3 percent zinc. No other data on the grade of mined ore is given in his report.

1/ Dings, McC. D., 1951, The Wallapai mining District, Cerbat Mountains, Mohave County, Arizona: U. S. Geol. Survey Bull. 978-E, p. 147.

2/ Wanvig, J. D., Unpublished report to Mr. C. B. Ball, March 28, 1919.

The smelter shipments for the nine months of 1917, for 11,735 dry tons of concentrates, are given by Wanvig as follows:

Zinc	42.12%
Gold	0.57 oz/ton
Silver	12.70 oz/ton
Iron	9.93%
Manganese	0.66%
Insoluble	12.13%
Lead	1.5%
Copper	1.33%

From these values as well as from his figure of 3.49 as the concentration ratio for ore, and from his figure of 87.5 percent as the recovery, it is possible to derive the approximate content of other metals in the ore before treatment. The reason these calculated figures are only approximate is that the concentrates shipped to the smelter were derived from old tailings as well as from mined ore, and it is assumed that the grade of concentrates from both sources is the same. Also it is assumed that Wanvig's percent recovery and concentration ratio apply to other metals besides zinc.

The calculated values for the important metals of the ore, derived from the above figures, are as follows:

Zinc	13.8%
Gold	0.19 oz/ton
Silver	4.16 oz/ton
Lead	0.45%
Copper	0.43%

The calculated value for zinc checks pretty closely with the Leads value of 14.3%. The ore of this estimated grade probably came from the lower parts of the mine and most likely represents the grade of ore that might be obtained by further mining of the deposit.

AEC sampling of the Prosperity and Primrose adits gave results that ranged between 0.005 and 0.138 percent U_3O_8. Out of 13 samples, however, only two assayed above 0.10. The location and grade of each sample is given in figures 5 and 6. The low grade and limited distribution of uranium values indicates that the deposit is subcommercial in its uranium content.

Of the rare elements included in the application, the applicant seems to base most of his hopes on germanium and indium. In order to check on these two elements in the deposit, Romslo took a sample of the jig tailings pile and a sample made up of a composite of hand specimens of zinc ore from the dump. The following tests were run on these two samples as described in the report below by Luther G. Evans of the U. S. Bureau of Mines.

"Herewith are the results of chemical and spectrographic analyses on heavy mineral concentrates prepared from a jig tailing and a composite of selected hand specimens from the Solomon dump. The samples were submitted on February 2, 1956 by L. Reynar, U. S. Geological Survey, in connection with RMA project 4033.

"The two samples were dry crushed and ground to minus 100 mesh and then deslimed in water. The sand fractions were separated at a specific gravity of 2.90 in acetylene tetrabromide. Results of the heavy liquid separations are as follows:

Sample	Product	Weight percent
No. 1278AA (jig tailings)	Slime	45.5
	Sand float	50.4
	Sand concentrate	4.1
	Composite	100.0
No. 1278AB (composited hand specimens	Slime	53.0
	Sand float	17.9
	Sand concentrate	29.1
	Composite	100.0

"The sand concentrates which consisted of sulfides and iron oxides were then analyzed for their base and rare metal content as shown in the following table.

Element	Analysis, percent No. 12/54A Sand concentrate	No. 12/54B Sand Concentrate
Zn	30.10	49.40
Pb (wet chemical analysis)	1.60	0.68
Cu	0.88	1.02
In	0.01-01	0.01-0.1
Ge (semi-quantitive	<0.01	<0.01
Cd spectrographic	0.1-1.0	0.1-1.0
Co analysis)	0.01-0.1	0.01-0.1
Bi	0.01-0.1	0.01-0.1
U_3O_8 (Radiometric)	<0.01	<0.01

"From the chemical and spectrographic analysis it appears that the value of this ore is represented by its zinc, lead and copper content.

"The rare metal content of the concentrates is low. The only other elements of possible value would be cadmium and indium if they occur in the maximum quantity indicated by the semi-quantitative spectrographic analysis. These rare metals are recovered as by-products from lead and zinc smelting and at present are produced in greater quantities than can be consumed. If demands exceed production, ample higher grade ores than this are available."

The applicant submitted two analyses for these elements. One by Ledoux & Company (No. 726573, Sept. 17, 1955) was of a sample from 18 inches of the Galena vein in the Peach drift. This sample was analyzed spectrographically with the following results:

Indium ———— Trace less than 0.0005
Germanium ——— Not detected

The other sample was not identified by the applicant except to say that it was submitted by a Mr. H. B. Lawrence (deceased) for the Pontiac Mines, Inc. The spectrographic analysis by John Herman Laboratory is dated February 14th, 1959, and shows:

Indium ———— 0.1%
Germanium ———— 0.01 to 0.1%

The Ledoux analysis and the U. S. Bureau of Mines analysis are probably the most reliable of the three.

The application besides including zinc, lead, copper, silver, gold, uranium, germanium, and indium also includes cobalt, cadmium, bismuth, tantalum, and columbium. The application contains a single spectrographic analysis of doubtful origin as the only evidence for the presence of the minerals in this last group, with the exception of columbium and tantalum, for which no evidence whatever is offered. Consequently the examiners believe they have ample justification for not investigating the complete list of elements contained in the application. The inclusion or omission of these elements in the investigation would not effect the overall conclusions.

GENERAL GEOLOGY

The host rocks in the Wallapai mining district are chiefly granites, gneisses, schists, and amphibolite of Precambrian age. Throughout the district the gneissic and schistose structures strike generally northeast and dip steeply either to the northwest or to the southeast. The rocks are intruded throughout a large part of the district by the Ithaca Peak granite which may be either Mesozoic[1] or Tertiary[2] in age. Quoting Dings[3]:

> "The chief ore deposits of the Wallapai district occur in veins along fissures in all the rock types . . . . The source of the vein-forming solutions is believed to have been the magmatic reservoir of the granite stock (Ithaca Peak granite) . . . . The veins in the district are classed as mesothermal."

1/ Op. cit. pp. 131-132.
2/ Thomas, D. E., 1949, Ore deposits of the Wallapai district, Arizona: Economic Geology, vol. 44, p. 667.
3/ Op. cit. p. 133.

GEOLOGY OF THE GOLCONDA MINE

The Golconda vein and the veins associated with it are mostly in a gneissic granite. This rock appears to be more competent than surrounding parts of the Precambrian complex. Possibly this difference accounts for the persistence of the Golconda vein, and the presence of open cavities in it. Several dike-like, outlying bodies of the Ithaca Peak granite crop out in the immediate vicinity of the Golconda mine. These bodies have an attitude very similar to that of the Golconda vein and possibly were intruded in the same fissure system as that occupied by the vein. Even more closely associated with the vein than the granite are numerous small bodies of diabase that occupy the same fissure as the vein.

Dings, in his description of the district mineralogy, writes[1/]:

> "Excluding gangue minerals, the most abundant of the primary minerals are pyrite, sphalerite, galena, and chalcopyrite. Other minerals include arsenopyrite, pyrrotite, molybdenite, and argentite. In addition to those listed, Hastin has recognized tennantite, proustite, and polybasite. Gangue minerals are quartz, calcite, manganiferous siderite, and rarely rhodonite.
>
> "Quartz, usually accompanied by varying amounts of pyrite, is by far the most abundant gangue mineral. Most of the quartz is fine-grained and milky to gray in color. Some is of the chalcedonic variety. In many places along the veins small vugs are lined with quartz crystals. In a few places the veins show a poorly defined comb structure, but the quartz is generally massive and commonly fractured and recemented by later quartz."

The more abundant minerals mentioned by Dings were recognized at the Golconda mine. A preponderance of sphalerite over galena also is apparent at the mine. In fact a specimen from a spur of

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1/ Op. cit. p. 142.

the Golconda vein on the 1000 level near the Oro Plata shaft contains mainly sphalerite with small amounts of pyrite, but no recognizable galena.

AEC geologists[1] recognized no primary or secondary uranium minerals, but believe uranium is present in the form of uraninite, and that significant amounts of it generally are accompanied by high zinc values. Whatever the form of the uranium, it appears likely that it is only locally present in the zinc ore shoots of the Golconda mine. The reasons for believing this are as follows:

1) Even in the small part of the deposit that is accessible, AEC sampling showed great variation in the grade and distribution of uranium.

2) Dump samples taken during the examination and representing ore from the main part of the deposit contained no detectable uranium. Though leaching may have removed some uranium from this dump material it is unlikely that all the uranium would have been removed.

3) The probability that uranium was introduced after the main period of mineralization and after fault movement along the Golconda vein makes it likely that its distribution is somewhat different from that of the base metals.

Dings[2] and other observers recognize in the district an early stage of mineralization characterized by quartz and pyrite, a second stage, during which the fissures were re-opened and the valuable minerals deposited, a third stage with minor re-opening in which quartz was deposited as narrow veinlets, and a final stage which

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1/ Kurt, O. H. & Hatland, D. L., 1953, Preliminary report on uranium-bearing deposits in Mohave County, Arizona, RME-4086, pp. 32, 33, and 47.

2/ Op. cit. p. 43.

produced gouge and quartz breccia and some, but very little, additional mineralization. The AEC geologists write [1]:

> "Brecciation and porosity of the veins appear to be controlling factors in the concentration of uranium minerals from the ore-bearing solutions."

If this last observation is true, it appears that the uranium was introduced during the final stage of mineralization after the introduction of the zinc, lead, and precious metals, or else by later leaching from above.

The mode of occurrence of the indium is not known, but it is believed to be closely associated with the zinc.

The workings of the Golconda mine and the gross features of the vein system are shown in figures 3 and 4. The Golconda vein crops out at elevations of 4,900 to 4,960 feet along the flank of a steep, northwesterly-trending ridge in the Cerbat Mountains. Most of the production of the mine has come from this vein. The strike is N 40° W and the dip from 50 to 70 degrees NE. The steepest recorded dip is at the surface, and the flattest dip was observed at the north end on the 1000 level. The level map (fig. 3) indicates that the strike of the Golconda vein becomes progressively more westerly as the vein is followed from south to north. The Tub vein lies west of the Golconda vein and is more or less parallel to it. Judging from the level map the two veins intersect south of the Golconda shaft, and the Tub vein curves to the east as it is followed north from its intersection with the Golconda vein. The Blackfoot vein lies east of the Golconda vein and more or less parallels the Golconda. The comparatively small size

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1/ Hart and Ketland, p. 5.

of the workings on the Blackfoot suggest that it contained a much smaller deposit than the Golconda vein and was worked to only a comparatively shallow depth. The Golconda vein is traceable for a horizontal distance of over 3,000 feet and at the Golconda shaft it has been followed downdip for about 1,400 feet. According to Diagg[1] the vein ranges in thickness from 2 to 7 feet. Near its north end the Golconda vein splits into several branches. Just south of the Ore Flats shaft (fig. 3), where present drifting is underway, the Golconda vein has two small northerly-trending spurs 4 to 20 inches thick with a few inches of sphalerite in them. The Primrose vein, represented by the Primrose adit in figure 3, probably represents another northerly spur of the Golconda vein. The Golconda vein itself, where it has been cut by present drifting, contains only trace amounts of sphalerite and consists mainly of gouge. Some of the details of the Primrose vein and the north end of the Golconda vein in the Prosperity adit are shown in the AEC maps (figs. 5 and 6).

The presence of a large shoot within the Golconda vein is suggested by the distribution of workings on the level map (fig. 3) and the stope map (fig. 4). Also old stope maps in the possession of J. S. Bagg show an orebshoot on the Golconda vein between the main Golconda workings and the Big Bethel adit (fig. 3). According to Bagg some stoping was done in this shoot from the 600 level. Wanvig described the habit of ore bodies within the Golconda shoot, or within what he calls the "ore zone". He wrote[2] :

> "The fact that these ore bodies are usually continuous in the ore zone and have only local pinches, is the reason that the entire ore zone is eventually stoped out in the operation above each level."

1/ Op. cit. p. 154.
2/ Unpublished report to Mr. C. B. Ball, March 28, 1919.

Pinching and swelling of the veins along both the strike and the dip is a district habit that has been noted by other observers.

Dings[1] describes the structure of the veins in the Wallapai district as "irregularly massive or crudely banded by the arrangement of the sulphides." Not enough of the Golconda vein was seen to determine whether this description applies to it. Large-scale zoning of the sulphides also has been recognized in the district but apparently is not an outstanding feature of the ore deposits. Assuming that the sphalerite represents a higher-temperature phase than does the galena, it is probable that sphalerite rather than galena will continue to be the dominant valuable mineral at depth in the Golconda mine.

Although oxidation apparently has been an important ore-forming process in the district, the present main workings of the Golconda mine are below the zone of oxidation.

There is very little information available on structural control of the ore, or on its possible persistence in depth. Regarding structural control, Dings[2] refers to the work of two other geologists in the district as follows:

> "Garrett (1938, p. 118) states that in the Tennessee mine ore shoots tend to occur where the vein has changed to a more westerly strike than normal. Later work in the mine supports this generalization. Shrader (1909, p. 51) states that many of the ore shoots coincide with intersections or forkings of the veins. Distinct vein intersections, however, are rare. Many of the forks are enriched, but many of them have lesser grade ore than average."

Thomas, referring to district habit of the ore, writes:[3]

> "The paucity of sizable ore bodies might be due in part to the strong gouge filling of many veins."

1/ Op. cit. p. 143.
2/ Op. cit. p. 144.
3/ Op. cit. p. 693.

Vein intersections as well as gouge in the vein both may have a bearing on the distribution of ore at the Golconda mine. Where the Golconda vein could be observed on the 1000 level just south of the Ore Plate shaft, it is about 5 ft. wide, almost entirely gouge, and almost devoid of sulphide mineralization. This, however, is several hundred feet north of the nearest known oreshoot. Some mining was done at the intersection of the Golconda and Tub veins but the nature of the ore at this vein intersection compared to the ore in other parts of the mine is not known. Also, the oreshoot just south of the Big Bethel adit (fig. 3) appears to coincide in position with the projected intersection of the Primrose vein with the Golconda vein.

The maximum known vertical extent of individual deposits in the district is in the Golconda and Tennessee-Schuylkill mines, where depths of about 1400 feet have been attained. Most of the other deposits have been worked to much shallower depths than this, presumably because in the early days the miners mostly sought just silver and gold in the oxidized zone. Most workers in this area agree that the deposits have not been sufficiently explored in depth for base metals. This, combined with the mesothermal character of the deposits, offers some incentive for exploration at depth.

RESERVES

The reserves assignable to this deposit are necessarily based on old mine maps and on other reports. Because of this, reserve estimates only of the inferred and potential classes seem justified.

John D. Tanvig states in his private report that the mine has produced about 20,000 tons for each 100 feet of depth below the 700

level. This figure is in fair agreement with the known production of the mine. On the basis of 20,000 tons per level, Henvig estimated that 60,000 tons of milling grade ore remained between the 1100 and 1400 levels when the mine closed down. Apparently he believed that the deposit persisted to the 1400 level without diminution of volume or grade. On the other hand, he attributes a certain unfavorable aspect to the 1250 level without stating what this unfavorable aspect is. But against this unattractiveness of the 1250 level he cites:

> "the fact that about 15 feet below the . . . . level a body of high grade was entered in the shaft which opened to a width of 6 feet of solid high grade ore and continued for about 60 feet in depth,"

and also the

> "singular fact that development headings all told at the Golconda were rarely attractive or conducive of any great expectation of ore returns and yet the mine has produced fully 70,000,000 pounds of zinc with gold and silver values."

Henvig's report sounds reliable though somewhat on the optimistic side. We would be inclined, therefore, to place the inferred reserves between the 1100 level and 1400 level at about 40,000 tons, averaging about 14% zinc, ½% lead, ½% copper, 4 oz./ton silver, and 1/5 oz./ton gold. If the mine were reopened and the stopes made accessible some of this inferred tonnage might be transferred to the indicated and measured categories.

There is a geologic possibility of the ore in the main workings continuing below the 1400 level. There is also the possibility of a downward extension, below the 600 level, of the ore shoot shown on old maps north of the main workings and south of the Big Bethel adit. Such ore is not included in the above estimate because its existence is based on speculation rather than any geologic evidence. If

exploration were successful, however, the inferred reserves based on such findings might amount to another 40,000 tons. Our reserve estimates are considerably lower than those made for the Golconda mine by Frick and Brownfield in their examination report on the Tennessee-Sunnyhill Project (BMA 21-50). The reason for this difference lies more in a stricter use of the term "inferred reserves" rather than in any fundamental disagreement as to the geology and potentialities of the property.

PROPOSED EXPLORATORY AND PROMOTION PLANS

Proposed Explorations of Application

The applicant asked assistance in exploration work costing $166,750 as follows:

1. 300 feet of drifting from Prosperity adit on Golconda 600-foot level, plus ore bin ———— $9,000.00
2. 500 feet of drifting from Primrose adit on Golconda 500-foot level, plus ore bin ———— 16,000.00
3. 3,000 feet of drifting on or adjacent to the Golconda vein from Peach adit to connect with 1,000-foot level of Golconda shaft ———— 90,000.00
4. Install hoist and ore pockets on 1000 level and, if necessary, sink new shaft from 1000 to 1400-foot level———— 30,000.00
5. Contingencies, 15% of above ———— 21,750.00

Eligibility of Proposed Explorations

Item 1, 300-foot extension of Prosperity adit and construction of ore bin.

This work is not eligible for aid. It involves reopening of a section of ground in which no new ore can be expected. Mr. Begg said the object of the work was to make accessible a site for the pumping of mine water for use in the proposed concentrator. The proposed bin is for ore that may be found in the old workings.

Item 2, 300-foot extension of Primrose adit plus ore bin.

This work is not justified on the basis of the poor showings in the adit and because the applicant's favorable zone at the intersection of the Primrose and Prosperity adits will be encountered by the operator in the Prosperity adit and by work in progress on the 1050-foot level.

Item 3, 3300-foot extension of drift from Peach adit to Golconda shaft.

The exploratory portion of this work is confined to the extension of the drift from its present face to the old mine workings, a distance of about 1,250 feet. This drift would explore for a depth-extension of the ore shoot shown on old maps at the projected junction of the Primrose and Prosperity (Golconda) veins. The present practice of drifting at about 20 feet from the vein seems justified because the vein contains much gouge and would be expensive to follow. However, present testing of the vein by crosscuts at 150-foot intervals should be supplemented by drilling long holes at intervals of about 30 feet. This exploratory plan would comprise an estimated 1,250 feet of drifting, 225 feet of crosscutting (9 at 25 feet each) and 900 feet of drilling in 36 25-foot long-holes.

Continuation of the Punch adit an additional 700 feet south to the Golconda shaft probably would be necessary to make this adit useful as a haulageway for ore. This is because the adit is being driven without the survey that would be necessary to tie the adit at grade with the 1000 level of the old workings. A short raise or winze to the 1000 level from the Punch adit might be sufficient to gain access to the old workings for inspection purposes and to allow an estimate of the possibilities for further exploration. If, on the other hand, the 1000 level is caved and inaccessible then it is likely that much of the old workings are inaccessible and rather expensive rehabilitation of the mine would be necessary in order to investigate its potentialities at depth. The writers doubt whether the lower parts of the deposit hold enough promise to justify such expense.

<u>Item 4, Install hoist and ore pockets on 1000 level and, if necessary, sink new shaft from 1000 to 1400 level.</u>

This work probably is not eligible for aid as it too is designed to make ore reserves accessible.

If the mine workings are made accessible it is possible that other exploratory targets could be developed. One of these possible targets would be a depth-extension of the Tub vein. An examination of the Tub vein on the 500 and 600 level would indicate the advisability of diamond drilling for the vein from the Golconda workings. Another possible target would be a depth-extension of the Golconda vein that could be tested by diamond drilling from a crosscut.

Estimated Cost of Eligible Exploration
(Item 3 of page 18)

Drifting and prospecting - The following estimated cost of about $34.00 a foot is believed to be more realistic than the applicant's cost of $30.00 a foot as it is based on actual costs of the present efficient operation:

	Cost per 5 feet	Cost per ft.
Supervision 1/	$ 5.00	$1.00
Labor 2/	107.50	21.50
Powder, caps, etc.	15.00	3.00
Ventilation pipe	3.50	0.70
Air and water pipe	5.00	1.00
Trunk	11.00	2.20
Fuel, greases & repairs	10.00	2.00
Depreciation 3/	13.00	2.64
	$170.00	$34.04

1/ 1/4 time for supervisor at $500.00 a month.

2/ 5-man crew averaging 5 feet advance per working day. Average daily wages plus taxes of $21.50 per man, is based on bonus system.

3/ Depreciation costs are based on complete monthly advance of 125 feet and depreciation of the following equipment in 5 years:

1	365-C.F.M. diesel powered compressor	$10,500.00
1	128 Eimco shovel loader	3,000.00
1	Universal transmar	1,800.00
12	Mine cars @ $250.00 each	3,000.00
2	Cogeo pneumatic drills complete at $600 each	1,200.00
1	Cogeo bit grinder	300.00
		$19,800.00

Long hole drilling - Cost per foot should be about as follows:

Labor 1/	$0.70
Teams	0.10
Equipment & Supplies	0.65
Miscellaneous	0.20
	$1.65

1/ 2 men at $14.00 per day will be expected to show a daily advance of 40 feet.

Assays - The number of samples for assay is unpredictable but might total 45, one from each of the 9 crosscuts and 36 long holes. Cost of assaying the 45 samples for zinc, lead, copper, gold and silver would be about $5.00 each or a total of $225.00.

A summary of estimated costs follows:

Drift and crosscuts 1,475 feet @ $34.00 a foot	$50,150.00
Long holes, 900 feet @ $1.65	1,485.00
Assaying	225.00
Total	$51,860.00

Production Plan

The mine manager, J. S. Bagg, appears to have an efficient and clean operation at the Golconda mine. His overall plans, however, though not part of the DMEA application, do not appear to be sound. As the success or failure of the mining operation will be affected by the overall plans and would in turn affect DMEA interests, these plans will be briefly reviewed. According to Mr. Bagg, a 100-ton

Humphrey Spiral mill will shortly be built on the property for treatment of jig tailings from the old mill and Golconda ore. Concentrates will be trucked to a reduction plant which will be built at a selected site near Kingman. The first unit of the reduction plant will be a roasting plant which will yield sulphuric acid as a by-product. Calcines from the roaster then would be treated in a leaching unit and the resulting solutions would be treated in an electrolytic plant. End products at the plant would be electrolytic zinc and copper, and gold and silver by cyanidation of sludges. Regarding other products (germanium, indium, and uranium) Mr. Ayers says, "We will not know what percent of these valuable minerals will be recovered until metallurgical tests are run on many representative samples of mine ore and accurate assays of each ore made."

Essentially Bagg's expressed objective is to set up a plant that will mill and refine ore from the entire district and recover not only the base metals, but also germanium, indium, uranium, and possibly other rare metals. He visualizes the Golconda mine only as the opening wedge in a profitable metallurgical enterprise. To cover the expense of building such a plant Bagg apparently assumes the existence of the necessary ore reserves in the district. But exploration in the district has been too meager either to prove or to disprove such reserves, and a justifiable exploratory program for the Golconda mine could not sufficiently improve the overall reserve picture to warrant the outlay for such a plant. If the plant already existed at the Golconda mine then the ore could be economically mined and treated. Lacking such a

plant means having to face smelting and shipping costs that very likely would be prohibitive to the economic operation of the Golconda mine. The chances are, therefore, that even if the IMEA project discovered a significant tonnage of ore, this ore would not be mined for many years, and perhaps not at all.

ECONOMIC POTENTIAL

The economic potential of the Golconda mine has been considered on the basis of production by the conventional method and by the applicant's proposed method. The following estimates of costs and value of ore show that each of the production methods would result in an unprofitable operation.

Production by the conventional method would involve mining the ore, concentration of the ore at the property and sale of concentrates to a smelter. This production plan would be unprofitable because estimated smelter returns of $12.09 per ton of ore would be less than anticipated per ton mining costs alone of $15.50.

Cost of production by the applicant's previously outlined plan has been estimated at $36.00 per ton of ore before taxes and unavailable operating costs of the plant for reduction of concentrates. The estimated per ton value of the ore by this production plan would be $33.30, less about $3.33 for royalty payments, or approximately $30.00. The royalty payments would be 5 percent each to the Government and to the Pontiac Mines.

Estimated Mining Costs

M. J. Rising and L. L. Farnham in their report on the Tennessee-Beryllhill Project, Docket RMI-81-50, estimated that 1951 mining costs at the nearby Tennessee mine would be $15.50 a ton of ore. The Tennessee ground is classed as heavy and requires that the square-set method of mining be used except in a few instances where the cut and fill method is applicable. At the Golconda mine, the ground also probably is heavy and would require mining by the same methods except where narrow veins might be open-stoped. Cost of open-stoping might be a little less than mining by the other methods but the possible reduction in costs probably would be offset by the increase in costs of labor and materials since 1951. On this basis, present mining costs at the Golconda probably would be near $15.50 per ton of ore.

Estimated Cost of Proposed Production Plan

		Per Ton
Mining		$15.50
Concentration, operation only		2.00
Trucking concentrates		1.00
Capital expenditures		
Expenditures to date 1/	$ 70,000.00	
Due on equipment 1/	5,000.00	
Additional before Production 2/	200,000.00	
100-ton Humphrey spiral mill	30,000.00	
30-ton Roaster-acid plant	750,000.00	
20-ton Leaching and electrolytic plant 3/	250,000.00	
Plant site 1/	15,000.00	
	$1,320,000.00	16.50 4/
Overhead		1.00
Total before taxes and other operating costs		$36.00

1/ Costs obtained from Mr. Begg.

2/ Includes cost of reopening and equipping mine for production.

3/ Estimated minimum cost from Tucson Metallurgical Division, U.S.B.M.

4/ Based on estimated total reserves of 80,000 tons of ore.

Value of Ore

Sale of Concentrates to a Smelter. In estimating the per ton value of the ore it is assumed that the grade of present concentrates would be the same as the concentrates produced in 1917. Present per ton smelter returns, before royalty payments, on such concentrates would be $12.89 a ton of ore based on the following applicable smelter schedule and other reductions:

Gold 57 oz/T 80 percent at $32.21 per ounce	$ 14.688
Silver 12.7 oz/T 80 percent at $0.90 per ounce	9.144
Copper 1.33% 26.6# 65 percent at $0.44 minus $0.065 per pound	6.484
Zinc 40.12 842.4# 85 percent at $0.1233 minus $0.0045 per pound	84.359
	$114.675

Less - Base charge	$58.12	
Freight to El Paso	10.55	
Trucking to Kingman	1.00	69.67
Net smelter value per ton of concentrates		$ 45.00
Value per ton of ore (ratio of concentration 3.49 to 1)		$ 12.89

Sale of products from proposed reduction plant. Mr. Ayers has estimated that concentrates such as those produced in 1927 would show returns of $33.30 per ton of ore, before any credit for germanium, indium and uranium. That little or no credit would be derived from these rare metals is indicated by geologic findings and the previously given Bureau of Mines analysis of jig tailings from the old mill and ore specimens

from the mine dumps. On the basis of these findings it appears that any credit to Mr. Ayers' estimated returns would be confined to sulfuric acid. That a significant credit for sulfuric acid is unlikely is based on the present market price and freight rates. Sulfuric acid sells for $35.00 a ton in California, the principal potential market. Freight rates from Kingman amount to $22.40 a ton of acid.

CONCLUSIONS AND RECOMMENDATIONS

(1) Construction of the proposed elaborate reduction plant would be justified only if the Golconda ores are found amenable to treatment, and if ore reserves on the order of several hundred thousand tons are assured. These reserve requirements, however, are necessarily based on incomplete cost estimates. Reserves of this order of magnitude probably do not exist at the Golconda mine, though that much ore might be found in the district.

(2) In a conventional production plan consisting of mining, concentration of the ore, and shipment of concentrates to a smelter, mining costs alone at the Golconda would exceed smelter returns. Indicative of the present status of mining in the Wallapai district is the fact that the Tennessee-Schuylkill mine has shut down within the past few years and, like practically all the other mines in the district, still is idle.

(3) Tonnages of protore that might be substantiated by exploration and re-opening the mine could be considered significant enough to justify exploration despite economic arguments to the contrary. So because of the possibility of DMEA approval for government aid, an exploration plan

is set forth in this report. This plan rejects as development work much of the proposed program of the applicant.

Our recommendation, however, based on a study of the economic potentialities of the Golconda mine, is that the request for government aid should be denied.

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

RECEIVED
FEB 27 1956

February 24, 1956

224 New Customhouse
Denver 2, Colorado

Betty

Docket

Memorandum

To: Chairman, Operating Committee, DMEA

From: Executive Officer, DMEA Field Team, Region III

Subject: Docket DMEA 4033 (Lead-Zinc-Copper), Arizona-Golconda Metals, Inc., Golconda Mine, Mohave County, Arizona

This responds to your letter of February 17, 1956 regarding the present status of the subject application. We are advised that the field examiners are waiting for assay results to complete their Report of Examination.

W. M. Traver

W. M. Traver

File Copy
Surname
Griswold
Selfridge
Herman
Mottenbach

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION 500
WASHINGTON 25, D. C.

FEB 17 1956

Mr. W. M. Traver
Executive Officer
DMEA Field Team, Region III
224 New Customhouse Bldg.
Denver 2, Colorado

Re: Docket No. DMEA-4033 (Lead-Zinc-Copper)
Arizona-Golconda Metals, Inc.
Golconda Mine
Mohave County, Arizona

Dear Mr. Traver:

On February 15 we received a telephone inquiry from Mr. John C. Foster, treasurer of the applicant company. We advised him that we would consult with you as to the present status of the application.

We are enclosing two copies of a letter from the Applicant, dated November 21, 1955. While it deals mainly with title matters which, if a favorable report is received, will eventually have to clear through our legal department, you should have copies in your files.

Sincerely yours,

George C. Selfridge
Chairman, Operating Committee (246)

Enclosures

WRGriswold/er 2/16/56
Copy to: Docket
Admr R File
Op. Committee
Base Metals
Mr. Bishop, USBM
Mr. Kiilsgaard, USGS
Chron.

APPROVED:

/s/ Robert W. Gaebler (246)
Member, Bureau of Mines

Thor H. Kiilsgaard (246)
Member, Geological Survey

R.C.S.

TELEPHONE
WHITEHALL 3-9361

MINE
KINGMAN, ARIZONA

ARIZONA-GOLCONDA METALS, INC.
SUITE 718
80 WALL STREET
NEW YORK 5, N. Y.

RECEIVED
NOV 28 1955

Docket

November 21, 1955

United States
Department of the Interior,
Defense Minerals Exploration Adm.,
Washington 25, D.C.

Re : Docket No.-4033
Arizona-Golconda Metals,Inc.
Golconda Mine,
Mohave County, Arizona

Attention : C.O. Mittendorf, Administrator

Dear Mr. Mittendorf :

I apologize for not answering yours of November 6th sooner as I had to communicate certain information to our Mr. Bagg at the mine. I will endeavor to clarify the questions you asked for as follows :

(1) Referring to Exhibit 1A Assignment Of Lease,
Please be advised that under date of November 17, 1954 the name of this Company was changed to Arizona-Golconda Metals,Inc. from the Uranium Corp. of Arizona.
This was effected by the unanimous vote of the Stockholders of the Uranium Corp. of Arizona and all of the necessary transfers of the contracts, leases, etc. reverted to them. Since this date of Nov. 17,1954 , we have been functioning as Arizona-Golconda Metals,Inc.

(3) In the agreement of lease dated March 6, 1954 please be advised that this was finally modified and made to read agreeing to give Pontiac Mines, Inc. a five percent royalty on all of our claims, both patented and unpatented, for a period of 50 years. This is based on five percent of the net smelter returns. In explanation of our arranging to do this was the fact that Pontiac Mines, Inc. had originally requested a ten percent royalty for a term of only ten years. The Directors of this Company did not consider this a sufficient time element to carry foward our program. Hence our agreeing to sign a lease under the new conditions. We also figured we would save some little money by this arrangement, which we figured would eliminate a lot of time and bookkeeping inasmuch as we will haul all of our ores through the Peach Tunnel and then to the proposed concentration mill.

(4) I am answering this paragraph in Mr. J.S. Bagg's own words to qualify this. Mr. Bagg is our Vice President, Mining Engineer and Director of Operations at the mine. Mr. Bagg explains this situation as follows :
This has been the subject of very careful analysis and research by the best informed experts on mining law, and reference to the codes and decisions. The Peach Tunnel was finished in 1928 (27 years ago) and had passed through all these claims, and into the property of the now A.G.M.,Inc. The federal statutes permit states to enact easment laws covering such contingencies. I sued to quiet title to these properties (with the exception of the mentioned patents) and the Supreme Court of Arizona confirmed my ownership 100%, 5 justices concurring. When I filed the quiet title suit, the then claimants were wrecking the tunnel and removing track and fixtures. I personally stopped them from doing this. However, under the law, they may

demand that we haul their ore if any, provided that it does not interfere with our operations, and the Court may set an arbitrary hauling price per ton for hauling, if they might be determined to do this. The Todd claim has nothing. The Mariposa may have some ore left and the only way they could approach us would be on the basis of a nuisance value. However, we anticipate no trouble whatsoever in arriving at a mutually satisfactory way for so doing.

The Arizona State Codes are very definite in their stand on adjoining and connected workings. It commands both parties to keep all exits open at all times, and if one refuses, the State will order them to comply. Under this the Mariposa (through which there is an exit to the surface) must keep that exit not only open, but in a state of repair at their own expense. If this is not done, the State will order it done and place a charge against them for this maintenance. We do not anticipate any trouble with Mariposa along these lines as we are throughly within the law, having checked this legally and with the State Mine Inspector.

The writer feels that the above items mentioned and explanations given may be further analysed to your Departments satisfaction when your representatives visit with us from your Denver Office.

All matters pertaining to our Company providing for the proper owners consent to liens, executed by the owners of the leased claims will be taken care of by our Mr. Bagg at the mine.

Yours very truly,

ARIZONA-GOLCONDA METALS, INC.

By : John C. Foster

John C. Foster, Treasurer

JCF:gb

Docket

November 16, 1955

Guswold
Betty

Memorandum

To: W. R. Storms

From: Acting Superintendent, Denver Experiment Station, Reg. III

Subject: Docket DMEA 4033 (Lead-Zinc-Copper), Arizona-Golconda Metals, Inc., Golconda Mine, Mohave County, Arizona

Enclosed is the application submitted by Arizona-Golconda Metals, Inc., in the amount of $166,750.00.

A field examination and suitable report are required. The examination report should be forwarded directly to the Executive Officer, with a copy of the memorandum of transmittal to this office.

John F. Shaw

Enclosures

cc: E. N. Harshman
J. N. Faick
W. M. Traver (3)
Chm. Op. Com (2)

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

RECEIVED
NOV 17 1955

November 15, 1955

Griswold

Docket

224 New Customhouse
Denver 2, Colorado

Memorandum

To: J. F. Shaw (With brochure)
J. H. Faick

From: Executive Officer, DMEA Field Team, Region III

Subject: Docket DMEA 4033 (Lead-Zinc-Copper), Arizona-Colorado Metals, Inc., Colorado Mine, Mohave County, Arizona

Enclosed is the subject application in the amount of $166,750.00. Also enclosed is a copy of a letter dated November 8, 1955 from the Chairman of the Operating Committee and attached memoranda of review by E. E. Nelson and S. M. Bishop. A copy of a letter from C. O. Mittenhurf to the applicant is also attached for your information because of the pertinent points brought out in this letter.

A field examination and suitable report are requested.

W. M. Trover

By J. W. Townsend
J. W. Townsend

Enclosures

HMC:ab
cc: Chair. Op. Comm. (2)

File Copy
Surname
Friswold
Gehan
Kierkegaard
Selfridge
Johnson

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

NOV - 8 1955

Mr. John C. Foster, Treasurer
Arizona-Golconda Metals, Inc.
80 Wall Street
New York 5, New York

Re: Docket No. DMEA-4033 (Lead-Zinc-Copper)
Arizona-Golconda Metals, Inc.
Golconda Mine
Mohave County, Arizona

Dear Mr. Foster:

The application of your company for Government assistance to explore its property has been reviewed by the Base Metals Division of the Defense Minerals Exploration Administration and has been referred for a field examination to:

Mr. W. M. Traver
Executive Officer
DMEA Field Team, Region III
224 New Customhouse Bldg.
Denver 2, Colorado

The Regional Office will contact you at an early date as to when an examination is to be made. Any assistance that you may give the members of the Field Team during the examination will be appreciated.

Meanwhile there are certain matters which should be cleared up now, rather than incur the possibility of delay later on.

1. Your "Exhibit 1A", Assignment of Lease, covers a transaction between the Mohave Metals, Mining and Reduction Corporation and the Uranium Corporation of Arizona. We cannot see how your company derives any equity thereby unless you have a later transfer from the Uranium Corporation of Arizona to your concern.

R.C.G.

2. Your Exhibits "1B" and "1C" are copies of quit claim deeds from the Mohave Metals, Mining and Reduction Corporation to the Uranium Corporation of America. Again we cannot see how your company derives any equity thereby.

3. The Agreement of Lease, dated March 6, 1954 covers five patented mining claims owned by the Pontiac Mines, Inc. It provides, among other things, that the owner will receive 5 percent royalty on net ore sales from its property.

However, the agreement also provides that the Pontiac Mines, Inc. will likewise receive a 5 percent royalty on production from property owned by the Lessee. If the unpatented claims are owned by your company, as stated in the application, we are not clear as to why their production would be subject to royalty payments to others. Please clarify this for us.

4. We note that the Peach Tunnel passes through the Todd and Mariposa patented claims. If these claims are not owned or held under lease your company should obtain easements permitting passage through this property.

5. It seems probable that much of the rehabilitation work which you have outlined would logically be considered as development work and could not be considered as a proper item in an exploration program. Nevertheless, we are requesting a field examination and if the property is viewed favorably we trust that a mutually satisfactory exploration program can be devised.

It likewise will be necessary for your company to provide the proper Owners' Consent to Liens, executed by the owners of the leased claims. However, you should first clear up the title and royalty matters which we have mentioned above.

Sincerely yours,

E. O. Mittendorf (for)

Administrator

WRGriswold/er 11/2 & 7/55
Copy to: Docket
Admr R File
Op. Committee
Base Metals
Mr. Bishop, USBM
Mr. Kiilsgaard, USGS
Region III (2)
Chron.

File Copy
Surname
Griswold

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

Mr. John C. Foster, Treasurer
Arizona-Golconda Metals, Inc.
80 Wall Street
New York 5, New York

Re: Docket No. DMEA-4033 (Lead-Zinc-Copper)
Arizona-Golconda Metals, Inc.
Golconda Mine
Mohave County, Arizona

Dear Mr. Foster:

The application of your company for Government assistance to explore its property has been reviewed by the Base Metals Division of the Defense Minerals Exploration Administration and has been referred for a field examination to:

Mr. W. M. Traver
Executive Officer
DMEA Field Team, Region III
224 New Customhouse Bldg.
Denver 2, Colorado

The Regional Office will contact you at an early date as to when an examination is to be made. Any assistance that you may give the members of the Field Team during the examination will be appreciated.

Sincerely yours,

Administrator

WRGriswold/er 11/2/55
Copy to: Docket
Admr R File
Op. Committee
Base Metals
Mr. Bishop, USBM
Mr. Kiilsgaard, USGS
Chron.
Region III (2)

File Copy
Surname
Mrs. Selfridge
Fitzsimons

500

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

NOV - 8 1955

Mr. W. M. Traver, Executive Officer
DMEA Field Team, Region III
224 New Customhouse Building
Denver 2, Colorado

Re: Docket No. DMEA-6033 (Lead-Zinc-Copper)
Arizona-Golconda Metals, Inc.
Golconda Mine
Mohave County, Arizona

Dear Mr. Traver:

We are enclosing copies of memorandums dated October 28, by Mr. O. M. Bishop, USBM, and Mr. N. E. Nelson, USGS, covering the cited application. You will note that a field examination is recommended.

It seems likely that the proposed project would require considerable revision, in case you should view the property favorably. Probably much of the outlined rehabilitation would not be eligible as exploration and quite possibly the field engineers might be inclined to recast the entire project. In any event the material submitted with the application indicates that the property may have some merit, though the data are somewhat sketchy. If examination should indicate that a project is warranted, we trust that a mutually satisfactory program can be devised.

In view of the Applicant's mention of uranium occurrence, it would be well to look into this also.

Sincerely yours,

George C. Selfridge

Chairman, Operating Committee (GCS)

Enclosures

APPROVED:

/s/ Robert W. Geehan (GCS)
Member, Bureau of Mines

Thor H. Kiilsgaard (GCS)
Member, Geological Survey

WRGriswold/er 11/2 & 7/55
Copy to: Docket
Admr R File
Op. Committee
Base Metals
Mr. Bishop, USBM
Mr. Kiilsgaard, USGS
Chron.

R.C.S.

File Copy
Surname
Griswold

UNITED STATES
DEPARTMENT OF THE INTERIOR 500
DEFENSE MINERALS EXPLORATION ADMINISTRATION
WASHINGTON 25, D. C.

Mr. W. M. Traver
Executive Officer
DMEA Field Team, Region III
224 New Customhouse Bldg
Denver 2, Colorado

Re: Docket No. DMEA-4033 (Lead-Zinc-Copper)
Arizona-Golconda Metals, Inc.
Golconda Mine
Mohave County, Arizona

Dear Mr. Traver:

We are enclosing copies of memorandums dated October 28, by Mr. O. M. Bishop, USBM, and Mr. N. E. Nelson, USGS, covering the cited application. You will note that a field examination is recommended.

We call your attention to Mr. Bishop's comments to the effect that the proposed exploration program may require some revision in the event that you should feel favorably toward the granting of a contract.

Sincerely yours,

Enclosures:

Chairman, Operating Committee

APPROVED:

WRGriswold/er 11/2/55
Copy to: Docket
Admr R File
Op. Committee
Base Metals
Mr. Bishop, USBM
Mr. Kiilsgaard, USGS
Chron.

Member, Bureau of Mines

Member, Geological Survey

IN REPLY REFER TO:

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WASHINGTON 25, D. C.

RECEIVED
NOV - 1 1955
Griswold

October 28, 1955

Re: DMEA 4033
Arizona-Golconda Metals, Inc.
Monitor-Golconda Group
Mohave County, Arizona
$166,750.00 - Lead, Zinc, Copper

Memorandum

To: W. R. Griswold, Defense Minerals Exploration Administration

From: N. E. Nelson, U. S. Geological Survey

Subject: Review of application.

The applicant requests assistance in forwarding the rehabilitation of an old mine and exploration of veins which were large producers of zinc, silver, and gold during World War I. Copper and lead are also present and radioactive material has been detected.

The application is supported by reports by P. E. Landolt and Frank A. Ayer on the general feasibility of the project, if it is found that the report of John D. Wanvig, Jr., written in 1919 accurately portrays conditions.

By the time the application is processed, and a field examination can be made, the work under way may have substantiated some of the optimistic selling talk of the Wanvig report. Some assistance may be warranted.

Referral to the Field Team is recommended.

N. E. Nelson

N. E. Nelson

IN REPLY REFER TO:

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WASHINGTON 25, D. C.

RECEIVED
NOV - 1 1955

October 28, 1955

Re: DMEA 4033
Arizona-Golconda Metals, Inc.
Monitor-Golconda Group
Mohave County, Arizona
$166,750.00 - Lead, Zinc, Copper

Memorandum

To: W. H. Griswold, Defense Minerals Exploration Administration

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By the time the application is processed, and a field examination can be made, the work under way may have substantiated some of the optimistic selling talk of the Wanvig report. Some assistance may be warranted.

Referral to the Field Team is recommended.

N. E. Nelson

N. E. Nelson

NENelson:iml
G-10/28/55
cc: Director's reading, 4212
Branch reading, 4212
DMEA (3)
Docket file
O. M. Bishop, 3617

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES
WASHINGTON 25, D. C.

October 28, 1955

Re: DMEA-4033
(Pb-Zn-Cu; $166,750)
Arizona-Golconda
Metals, Inc.,N.Y.C.
Golconda, Peach Tunnel,
Pontiac & Davenport
mines
Wallapai Mining Dist.
Mohave County, Ariz.

Memorandum

To: W. R. Griswold, DMEA

From: O. M. Bishop,
Branch of Base Metals

Subject: Application for exploration assistance dated October 24, 1955 and received October 26, 1955

I have reviewed the application which asks assistance in exploration work costing $166,750 as follows:

1.	3,000 feet of drifting on Golconda vein from Peach Tunnel to connect with 1,000-foot level from Golconda shaft ----------	$90,000
2.	500 feet of drifting from Primrose Tunnel on Golconda 500-foot level, plus ore bin (this may be Highland Tunnel of Exhibit 5B) ----------	15,000
3.	300 feet of drifting from Prosperity Tunnel on Golconda 600-foot level, plus ore bin ----------	9,000
4.	Estimated cost of installing hoist and ore pockets on 1,000 level station of Golconda shaft ----------	30,000
	Contingencies 15% of above ------	21,750
	Total ----------	166,750

In reviewing the docket I concluded the property has much merit and well warrants an exploration program. The program outlined, however, appears to be largely a development program designed to make accessible presently known or indicated ore, and to drain the mine, obviating pumping.

I recommend that the application be referred to the field team for appraisal on the ground to determine (1) if the economic potential of the property warrants an exploration program, and (2) whether the program outlined is fully satisfactory, and meets the criteria of exploration.

I note that the Todd, Mariposa and Mariposa First North Extension patented claims all are cut by the Peach Tunnel, but are not listed among the claims held by the applicant. This might well be checked during the investigation.

O. M. Bishop.

O. M. Bishop

Copy to - Div. of Minerals
Mr. Kiilsgaard, Rm. 5222
O. M. Bishop
Files

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES
WASHINGTON 25, D. C.

October 28, 1955

Re: DMEA-4033
(Pb-Zn-Cu; $166,750)
Arizona-Golconda
Metals, Inc., N.Y.C.
Golconda, Peach Tunnel,
Pontiac & Davenport
mines
Wallapai Mining Dist.
Mohave County, Ariz.

Memorandum

To: W. R. Griswold, DMEA

From: O. M. Bishop,
Branch of Base Metals

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	Contingencies 15% of above ------	21,750
	Total ----------	166,750

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I recommend that the application be referred to the field team for appraisal on the ground to determine (1) if the economic potential of the property warrants an exploration program, and (2) whether the program outlined is fully satisfactory, and meets the criteria of exploration.

I note that the Todd, Mariposa and Mariposa First North Extension patented claims all are cut by the Peach Tunnel, but are not listed among the claims held by the applicant. This might well be checked during the investigation.

[Signed

O. M. Bishop

Copy to - Div. of Minerals
Mr. Kiilsgaard, Rm. 5222
O. M. Bishop
Files

WHITEHALL 3-9361

ARIZONA-GOLCONDA METALS, INC.

JOHN C. FOSTER
TREASURER

80 WALL STREET
NEW YORK 5, N. Y.

Engr. at mine

John Sherman Bogg

Subject: DMEA-4033
Re: Exploration

Arizona-Golconda Metals Inc.,
80 Wall St.,
New York 5, N.Y.

October 27, 1955

Gentlemen:

The receipt of your application dated October 24, 1955 for exploration assistance under the Defense Production Act of 1950, as amended, is hereby acknowledged.

Your application has been assigned Docket Number DMEA-4033 and referred to the Base Metals Division.

Kindly identify all future correspondence relating to your application by this docket number.

Sincerely yours,

Robert E. Adams, Chief
Operations Control and
Statistics Division

MF-103
(Revised April 1952)

UNITED STATES DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

RECEIVED
OCT 26 1955

Form Approved.
Budget Bureau No. 42-R1035.2.

APPLICATION FOR AID IN AN EXPLORATION PROJECT, PURSUANT TO DMEA ORDER 1, UNDER THE DEFENSE PRODUCTION ACT OF 1950, AS AMENDED

Not to be filled in by applicant

Docket No. 4033
Metal or Mineral Lead-zinc-copper
Date Received 10-26-55
Estimated Cost 166,750.00
Participation (Government %)

INSTRUCTIONS

1. *Name of applicant.*—(*a*) State here your full legal name, in the form in which you will wish to contract, and your mailing address: ARIZONA-GOLCONDA METALS, INC.
80 Wall Street, New York 5, N. Y.

(*b*) If other than an individual, add to your name above whether a corporation, partnership, etc., and the name of the State in which incorporated or otherwise organized. See sheet #1

(*c*) If a corporation, add to above statement, titles, names and addresses of officers. See sheet #1

(*d*) If a partnership, add to the above statement the names and addresses of all partners.

2. *General.*—Read DMEA Order 1, "Government Aid in Defense Exploration Projects," before completing this application. Submit this application and all accompanying papers in quadruplicate (four copies), with your name and address on each sheet of the application and on all accompanying papers. Where sufficient space is not provided on the form for all required information, state it on an accompanying paper, with a reference in each case to the instruction to which it refers by number. Comply with all applicable instructions; or, if not applicable, so state. File the application with Defense Minerals Exploration Administration, Department of the Interior, Washington 25, D. C., or with the nearest field executive officer thereof.

3. *Applicant's property rights.*—(*a*) State the legal description of the land upon which you wish to explore, including all land which you possess or control that may be benefited by the exploration, and excluding any land or interest in land which is not to be included in the exploration project contract See sheet #1 plus exhibits

(*b*) State any mine name by which the property is known. See sheet #1

(*c*) State your interest in the land, whether owner, lessee, purchaser under contract, or otherwise See sheet #1

(*d*) If you are not the owner, submit with this application a copy of the lease, contract, or other document under which you control the property. See sheet #1

(*e*) If you own the land, describe any liens or encumbrances on it None- See sheet #1

(*f*) If the land consists of unpatented claims, add to the description above, the book and page numbers for each recorded location notice. See sheet #1

4. *Physical description.*—(*a*) Describe in detail any mining or exploration operations which have been or now are being conducted upon the land, including existing mine workings and production facilities. State your interest, if any, in such operations. Also describe accessibility of mine workings for examination purposes. See sheet #2

(*b*) State past and current production, and ore reserves, if any, giving quantities and grades. See sheet #2

(*c*) Describe the geologic features of the property, including mineralization, type of deposit (vein, bedded, etc.), and your reasons for wishing to explore. Illustrate with maps or sketches. Send with your application (but not necessarily as a part of it) any geologic or engineering report, assay maps, or other technologic information you may have, indicating on each whether you require its return to you. Do not wish reports returned. See Map #5B.

(*d*) State the facts with respect to the accessibility of the project: Access roads, distances to shipping, supply and residence points. See sheet #3

(*e*) State the availability of manpower, materials, supplies, equipment, water, and power. See sheet #3

5. *The exploration project.*—(*a*) State the mineral or minerals for which you wish to explore See sheet #3 plus exhibits

(*b*) Describe fully the proposed work, including a map or sketch of the property showing a plan (and cross sections if needed) of any present mine workings, and the location of the proposed exploration work as related to such features as contacts, veins, ore-bearing beds, etc. See Map #5B

(*c*) The work will start within 30 days and be completed within 24 months from the date of an exploration project contract.

(*d*) State the operating experience and background of the applicant with relation to the ability to carry out such exploration project, and also that of the person or persons who will supervise the operations. See sheet #3

6. *Estimate of costs.*—Furnish a detailed estimate of the costs of the proposed work (you will have to use a separate sheet), under the following headings. Add the totals under all headings to give the estimated total cost of the project:

(*a*) *Independent contracts.*—(Note.—If the applicant does not intend to let any of the work to contractors, write "none" after this item. To the extent that the work is to be contracted, do not repeat the cost of the contract-work in subsequent items.) State the cost of any proposed independent contracts for the performance of all or any part of the work, expressed in terms of units of work (such as per foot of drilling, per foot of drifting, per hour of bulldozer operations, per cubic yard of material moved, etc.). No independent contracts. See sheets #4 to #7.

(*b*) *Labor, supervision, consultants.*—Include an itemized schedule of numbers, classes and rates of wages, salaries or fees for necessary labor, supervision and engineering and geological consultants. See sheet #4

(*c*) *Operating materials and supplies.*—Furnish an itemized list, including items of equipment costing less than $50 each, and power, water and fuel. See sheets #4 and #5

(*d*) *Operating equipment.*—Furnish an itemized list of any operating equipment to be rented, purchased, or which is owned and will be furnished by the Operator, with the estimated rental, purchase price, or suggested use-allowance based on present value, as the case may be. See sheet #4

(*e*) *Rehabilitation and repairs.*—Furnish a detailed list showing the cost of any necessary initial rehabilitation or repairs of existing buildings, installations, fixtures, and movable operating equipment, now owned by the Operator and which will be devoted to the exploration project. See sheet #5

(*f*) *New buildings, improvements, installations.*—Furnish a detailed list showing the cost of any necessary buildings, fixed improvements, or installations to be purchased, installed or constructed for the benefit of the exploration project.

(*g*) *Miscellaneous.*—Furnish a detailed list showing the cost of repairs to and maintenance of operating equipment (not including initial rehabilitation or repairs of the Operator's equipment), analytical work, accounting, workmen's compensation and employers' liability insurance, and payroll taxes.

(*h*) *Contingencies.*—Give an estimate of any necessary allowances for contingencies not included in the costs stated above.

NOTE.—No items of general overhead, corporate management, interest, taxes (other than payroll and sales taxes), or any other indirect costs, or work performed or costs incurred before the date of the contract, should be included in the estimate of costs.

7. (*a*) Are you prepared to furnish your share of the cost of the proposed project in accordance with the regulations on Government participation (Sec. 7, DMEA No. 1)?

(*b*) How do you propose to furnish your share of the costs?

[X] Money [X] Use of equipment owned by you [ ] Other

Explain in detail on acompanying paper.

CERTIFICATION

The undersigned, whether as an individual, corporate officer, partner, or otherwise, both in his own behalf and acting for the applicant, certifies that the information set forth in this form and accompanying papers is correct and complete, to the best of his knowledge and belief.

Dated October 24, 1955, 195__

Arizona-Golconda Metals, Inc.
(Applicant)

By John C. Foster

John C. Foster, Treasurer
80 Wall Street, New York 5, N.Y.

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

U. S. GOVERNMENT PRINTING OFFICE 16—66551-1

TELEPHONE
WHITEHALL 3-9361

MINE
KINGMAN, ARIZONA

ARIZONA-GOLCONDA METALS, INC.
SUITE 718
80 WALL STREET
NEW YORK 5, N. Y.

October 24, 1955

SHEET #1

1. Arizona-Golconda Metals, Inc.
80 Wall Street, New York 5, N.Y.

(b) Incorporated under the laws of the State of Delaware, August 1953

(c) Officers Of The Company Are :

President	John T. MacEvoy	Cedar Grove, New Jersey
Vice Pres.	Henry Cross	15 Beekman St., N.Y.City
Secretary	Fred'k Luhrs	17 John Street, N.Y.City
Treasurer	John C. Foster	80 Wall Street, N.Y.City
Man'g Eng.	John S. Bagg	P.O.Box 1247, Kingman, Arizona.

2. Application to be filed at the Denver Regional Office.

3. The Company holds ten (10) unpatented lode mining claims and is lessee, under a fifty year lease expiring on January 31st, 2004, of five (5) PATENTED lode mining claims, covering approximately 275 acres in all.
The claims are identified as follows :

Unpatented claims	Patented claims
Monitor	Golconda
Monitor Extension	Virginia
Monitor #1	Tub
Monitor #3	Little Jimmie
Monitor #4	Prosperity
Monitor #5	
Monitor #6	
Monitor #7	
Monitor #8	
Monitor #10	

These claims are all located in Sections 5 and 6, Tract 22 North, Range 17 West, Gila and Salt River Meridian, Golconda Section, Wallapai Mining District, Cerbat Mountain Range, Mohave County, Ariz., being approximately ten miles North of Kingman, Arizona.

Note : See Title policy enclosed Exhibit #1

(b) Golconda, Peach Tunnel, Pontiac and Davenport

(c) Owner and Lessee

(d) See Copy of lease from Pontiac Exhibit #2

(e) No liens or encumbrances of any kind

(f) See Title policy enclosed as Exhibit #1

TELEPHONE
WHITEHALL 3-9361

MINE
KINGMAN, ARIZONA

ARIZONA-GOLCONDA METALS, INC.
SUITE 718
80 WALL STREET
NEW YORK 5, N. Y.

Sheet #2

#4 See the report by John Wanvig (Engineer) in enclosed exhibit #3, Mr. Wanvig reports on the operations for a period of two years and nine months prior to our taking over the property. We are now in the business of opening up these workings together with other workings on the property.
We started on June 20th 1955 clearing the half mile long "Peach" tunnel and this is now in first class condition and the trackage has already been laid. From this point, we are drifting along the "Golconda" vein towards the Golconda workings and the 1,000 level of the Golconda shaft. This tunnel has been completely rehabilitated and we are driving along the Golconda vein over 350 feet, averaging about six feet per day with one shift working. However, on October 17th 1955 a second shift was added. This operation is in full swing now. We are also cleaning out the 500 level adit to the 500 Golconda via the "tub" vein. (See maps covering the Wanvig report) We have cleaned, repaired and retimbered this adit for over 200 feet and have crossed the "Tub" vein and this week we will begin exploring the Tub drifts and seeking to open them to their contact with the Golconda workings.
We did some exploratory work on the Primrose, opening up some new faces of ore and solving a geological question that has been of interest.
This property, with some track laying and timbering in spots will be ready to go into production as soon as the mill is ready to take ore for concentrating. The mine workings so are readily accessible for examination by your engineers or other interested parties.
For your information Mr. Ellsworth Dougherty, mining engineer from the office of the Securities and Exchange Commission in San Francisco made an examination of our properties a few months ago and he left there well pleased with the project.
The engineers from the Atomic Energy Commission spent several months in the vicinity of our mine and their findings and maps show the result of their visit with us. (See AEC Maps and Findings in enclosed exhibit #12.

(b) See the enclosed Wanvig report exhibit #3 for past production and smelter returns.
Also on pages 147 you will find production record, and pages 153-154 of the Geological Survey Bulletin #978 E, "The Wallapai Mining District, Cerbat Mountains, Mohave County, Arizona". See also the U.S. Geological Survey Bulletin 397.

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MINE
KINGMAN, ARIZONA

ARIZONA-GOLCONDA METALS, INC.
SUITE 718
80 WALL STREET
NEW YORK 5, N. Y.

Sheet#3

#4 (c) See enclosed Mining Engineers reports Exhibits #4 and #5 by Frank Ayer and Percy E. Landolt. (Mr. Landolt is the Consulting Engineer for the Lithium Corp. of America)
Copies of recent assays #7-8-10 by Ledoux & Co., New Jersey are enclosed as exhibits.
Copies of assay enclosed #13 by John Herman Labortary, Los Angeles, Calif., enclosed as exhibits.
We propose exploring for both Basic and Precious Metals as shown in copies of assay reports.

(d) The Company's property located 10 miles from Kingman, Arizona, is easily accessible, the roads are excellent, located four miles from the Boulder Dam Highway (US Route 93). Electric Power from Boulder Dam with plenty of water for milling available on the Company's property.

(e) Plenty of manpower, supplies, materials close at hand. Hoover Dam power on property and El Paso Natural Gas available (30"-24").

#5 Zinc, Lead, Copper, Gold, Silver, Germanium, Indium, Cobalt, Cadmium, Uranium and Bismuth, Tantalum and Columbium.

(b) See Per Maps enclosed as exhibit 5B

(c) Work now in progress (a two year program for Exploratory work) See exhibit 5B.

(d) Work will be supervised by John Sherman Bagg, Mining Engineer who is also a Director & Managing Engineer of the Company living in Kingman, Arizona. Mr. Bagg is a mining engineer with 50 years of operating, examination and reporting experience. University of California College of Mines, University of Southern California Chemistry & Metallurgy, Pomona College (Varied).

References: James Boyd, Fred Searles, Bert Austin, Edwin Letts Oliver, Wilbur Grant, Henry Carlisle, Ellsworth Dougherty (all well known to the U.S.G.S., and the Bureau of Mines).

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SHEET #4

6. (a) No independent contracts in force

(b) Labor (Present Operations)

Seven men- 40 hour week (week and 8 hours overtime)	
Underground Miners. Total weekly payroll	$ 910.00
Employers Number : Federal - Applied For	
State of Arizona # 0841444	
Compensation Insurance Policy # 31747	
Approx. charge 8 - 10% of payroll	
Originally contracted labor - mines contracting company	
Wickenburg, Arizona - Discontinued as unsatisfactory.	

Supervision

John Sherman Bagg - Retainer - Monthly	500.00
Duties include geological work, mine engineering and administration	
TOTAL APPROX. MONTHLY COST	$ 4,800.00

(c) Operating Materials & Supplies

7,000 feet 16 lb. rail (including spikes,etc.)	$ 13,440.00
10,000 feet Mine Timber Lumber (ties 10"x 10"x 7')	1,083.15
Steel piping 3" @ 81¢ foot	3,555.00
" " 1" @ 19¢ "	363.31
Miscellaneous Fittings	237.00
Fuel Oil (2000 gallons) 16.6¢	333.20
Lubricating Oil, Grease, Engine Oil	88.00
Hand tools, axes, saw blades, etc.	500.00
Calcium Carbide (100 lbs)	16.00
Oxygen Acetylene for welding	25.00
Powder Amojel and Apache	1,650.00
Fuses	93.00
Laboratory Equipment Scale and Miscel. Supplies	750.00
Power - Water	------
Mine Pumps (Boiler Feed Type)	150.00
TOTAL	$ 22,283.66

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SHEET #5

6. (d) Operating Equipment (Owned unless otherwise specified)

Welding Equipment (acetylene)	$	76.00
" " (accessories)		50.00
10" Galvanized Pipe 1,800 feet (sheet metal-heavy ventilation)		1,800.00
Machine Drill Lubricator		26.21
Plastic Ventilator Pipe 50 feet 12"		72.00
Drill Steel 10 six foot lengths		190.00
Mucker Hose 75'		102.00
Vise		75.00
Copco Rock Drill (2)		720.00
Hose Set & Accessories (drill rods,etc.) 2		421.00
Copco Pushers (2)		330.00
Mine Cars Five 20 Cu. Ft.		1,298.00
" " Six 20 " "		1,200.00
Mine Car Trucks (3)		560.00
" " " (5)		500.00
Compressor (315 Cu. Ft. Diesel (Le Roi Rix Port. ($1,050.00 paid to date)		4,200.00
Compressor (210 Cu. Ft. Le Roi (gasoline) ($600.00 paid to date)		2,000.00
Eimco Mucking Machine ($900.00 paid to date)		3,600.00
Jeep ($680.00 paid to date plus $261.00 note held by Valley National Bank)		2,040.00
Dodge Coupe (used) 1947		650.00
Universal Trammer ($800.00 paid to date)		2,200.00
TOTAL ----------	$	22,110.21

(e) Rehabilitation Work

Repair of Mine Buildings (lumber, labor,etc.)		1,500.00
Peach Tunnel (contracted) June 20-August 2nd. Labor $3,289.00 Contractor $1,500.00		4,789.00
Golconda Adit (500) August & Sept. Labor $2,500.00; 500 feet Track 1,000.00		3,500.00
Primrose Tunnel (6 weeks to Sept 30, Labor $1,000.00) Supplies 500.00)		1,500.00
TOTAL ----------		11,289.00

(f) New Buildings, Improvements, Instalation		None
(g) Miscellaneous (previously included)		None
TOTAL ----------	$	55,682.87
(h) Contingencies 15%		8,352.43
TOTAL	$	64, 035.30

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MINE
KINGMAN, ARIZONA

ARIZONA-GOLCONDA METALS, INC.
SUITE 718
80 WALL STREET
NEW YORK 5, N. Y.

SHEET #6

RECAPITULATION

#6	(c)	Operating Materials & Supplies	$ 22,283.66
		Equipment	22,110.21
		Rehabilitation Work	11,289.00
			$ 55,682.87
		Contingency (15%)	8,352.43
			$ 64,035.30

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KINGMAN, ARI

ARIZONA-GOLCONDA METALS, INC.
SUITE 718
80 WALL STREET
NEW YORK 5, N. Y.

SHEET #7

#6. Estimate of Costs : Exploration and Rehabilitation

Peach Tunnel	: Approximately 3,000 feet Drifting @ $30.00 foot we will drive another 200 feet then crosscut to Golconda vein.	$90,000.00
Primrose Tunnel	: Approximately 500 feet Drifting @ $30.00 foot	15,000.00
	ore bins to be built here, trackage etc.	1,000.00
Prosperity Tunnel	: Approximately 300 feet Drifting, and timbering @ $30.00 foot The prosperity adit is the 500 level of the Golconda, necessary to also build ore bins.	9,000.00
Golconda Shaft	: At the Portal of this Tunnel The shaft below the 1,000 foot level is in good condition as it has been under water since 1917. Necessary to install a hoist and ore bin at 1,000 foot level to tram the 60,000 tons there between the 1100 and 1400 level out through the Peach Tunnel. If this shaft is not in good condition, we will sink a new one in the Tunnel where we enter the stopped area, 600 feet north of the Golconda Shaft and 1400 feet ahead of us, as now going. estimated cost of this	30,000.00
		$ 145,000.00

Estimated time element to complete is twelve to eighteen months.

Depreciation on certain equipment, we understand that depreciation will be allowed at 1/60 of value per month.

Contingiency	: 15%	21,750.00
	TOTAL	$ 166,750.00

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SUITE 718
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NEW YORK 5, N. Y.

EXHIBITS

1. Northern Arizona Title Co. Policy

1a. Assignment of Lease from Mohave Metals to A.G.M., Inc.

1b. Quit Claim Deed Nellie Smith to Mohave M & M

1c. " " " " " " " "

2. Assignment of Lease (Pontiac to Mohave M & M)

3. Bell-Wanvig Letter

4. Report by Frank Ayer (Mining Engineer)

5. Report by P.E. Landolt (Consulting Engineer)

5b. Map of Properties showing proposed exploration program

7. Ledoux Assay Samples # 1-17

8. " " Sample #6

9. A.E.C. Assays

10. Sample 18" Golconda Peach Drift Aug 24,1955 - 726573

11. Progress Report #1

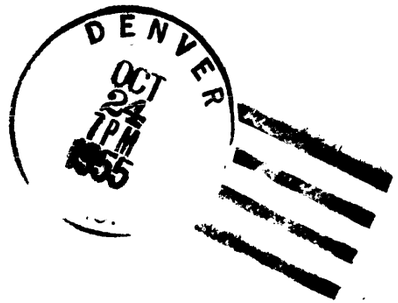
12. Maps made by A.E.C. Engineers in 1953 showing U_3O_8 contents

13. John Herman Lab. Report

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES

OFFICIAL BUSINESS

224 NEW CUSTOMHOUSE
DENVER 2, COLORADO



Defense Minerals Exploration Administration
U. S. Department of the Interior
Interior Building
Washington 25, D. C.

EXHIBIT 1B

RECEIVED
OCT 26 1955

QUIT CLAIM DEED

THIS INDENTURE, made the 12 day of ~~May~~ JUNE, 1954, between MOHAVE METALS, MINING AND REDUCTION CORPORATION, an Arizona corporation, party of the first part, and URANIUM CORPORATION OF ARIZONA, a Delaware corporation, party of the second part.

WITNESSETH, That the party of the first part, in consideration of Ten Dollars, lawful money of the United States of America, and other good and sufficient consideration, paid by the party of the second part, does remise, release and quit claim unto the party of the second part, its heirs and assigns forever, all of the following described property, situate, lying and being in Mohave County, State of Arizona, and being described, particularly, as follows: the Lode mining claims located in Sections 5 and 6, Township 22 North, Range 17 West, Gila and Salt River Base and Meridian, Mohave County, Arizona, and known as Monitor, Monitor Extension, Monitor #1, Monitor #3, Monitor #4, Monitor #6 and Monitor #7, recorded in the office of the County Recorder of Mohave County, Arizona, in Book 4B of Mines, pages 125 to 156; Monitor #5, amended, recorded in said office, in Book 4D of Mines at page 276; and Monitor #8 and Monitor #10.

TO HAVE AND TO HOLD the premises herein granted unto the party of the second part, its heirs and assigns forever.

IN WITNESS WHEREOF, the party of the first part has caused this instrument to be executed by its duly

authorized officer and its corporate seal to be hereunto affixed on the day and year first above written.

MOHAVE METALS, MINING AND REDUCTION CORPORATION

[illegible]ST

[illegible]ecretary

By John Sherman Bagg
President

STATE OF ARIZONA)
: ss.
COUNTY OF MOHAVE)

The above and foregoing Quit Claim Deed acknowledged before me this 12 day of ~~April~~ JUNE, 1954 by John Sherman Bagg, President of Mohave Metals, Mining and Reduction Corporation.

Nellie E. Smith
Notary Public in and for
the County of Mohave,
State of Arizona

[illegible]mission expires 6/2/55.

80458

Filed and Recorded at Request of
J. S. Bagg
June 12 A.D. 1954
at 40 minutes past 9 o'clock a M
in book 79 of DEEDS
Pages 67 - 68
Records of Mohave County, Arizona.

Peggy B. Smith
County Recorder

By
Deputy Recorder

Virginia Ainy

PHOTO COPIED
INDEXED

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Entry No. 60460

File No.

PHOTO COPIED

INDEXED

Filed and recorded at request of

J. S. Boyd

June 12 A. D. 1954

at 46 minutes past 9 o'clock A. M.

Recorded Book of

Docket No. 9 Pages 2 - 3

Records of Mohave County, Arizona

Peggy B. Smith

County Recorder

By

Deputy Recorder

F1 21

EXHIBIT 1A

1+2

RECEIVED
OCT 26 1955

Rec'd from Bagg w/o letter 6/17/19

ASSIGNMENT OF LEASE

BE IT KNOWN:

That Mohave Metals, Mining and Reduction Corporation, a corporation organized and existing under the laws of the State of Arizona, for Ten Dollars and other good and valuable consideration, the receipt of which is hereby acknowledged, does hereby sell, assign and set over to Uranium Corporation of Arizona, a Delaware corporation, all of its right, title and interest in and to:

> That certain Agreement of Lease dated March 6, 1954 by and between THE PONTIAC MINES INCORPORATED and MOHAVE METALS, MINING AND REDUCTION CORPORATION, which lease was filed and recorded in Docket No. 8, pages 258-265, records of Mohave County, Arizona, on March 11, 1954.

IN WITNESS WHEREOF, Mohave Metals, Mining and Reduction Corporation has caused this instrument to be executed by its duly authorized officer and its corporate seal to be hereunto affixed on the 12 day of JUNE, 1954.

MOHAVE METALS, MINING AND REDUCTION CORPORATION

By John Sherman Bagg
President

ATTEST:

A. L. Smith
Secretary

STATE OF ARIZONA)
COUNTY OF MOHAVE) ss.:

This instrument was acknowledged before me this 12 day of JUNE, 1954 by John Sherman Bagg, President, and A. L. SMITH, Secretary, of Mohave Metals, Mining and Reduction Corporation, a corporation duly organized and existing under the laws of the State of Arizona.

Nellie E. Smith
Notary Public in and for the County of Mohave, State of Arizona

My commission expires 6/2/55.

13

EXHIBIT 1C

Rec'd from Bob w/o Lett. 6/17/54

RECEIVED
OCT 26 1955

QUIT CLAIM DEED

THIS INDENTURE, made the 12 day of ~~May~~ June, 1954, between MOHAVE METALS, MINING AND REDUCTION CORPORATION, an Arizona corporation, party of the first part, and URANIUM CORPORATION OF ARIZONA, a Delaware corporation, party of the second part.

WITNESSETH, That the party of the first part, in consideration of Ten Dollars, lawful money of the United States of America, and other good and sufficient consideration, paid by the party of the second part, does remise, release and quit claim unto the party of the second part, its heirs and assigns forever, all of the following described property, situate, lying and being in Mohave County, State of Arizona, and being described, particularly, as follows: the entire interest of the party of the first part in and to any mining claims, mining properties, mine dumps and tailings located within the boundaries of said Sections 5 and 6, T22N, R17W., G&SRB&M, Mohave County, Arizona.

TO HAVE AND TO HOLD the premises herein granted unto the party of the second part, its heirs and assigns forever.

IN WITNESS WHEREOF, the party of the first part has caused this instrument to be executed by its duly

authorized officer and its corporate seal to be hereunto affixed on the day and year first above written.

MOHAVE METALS, MINING AND
REDUCTION CORPORATION

By John Sherman Bagg
President

ATTEST:

A. L. Smith
Secretary

STATE OF ARIZONA)
: ss.:
COUNTY OF MOHAVE)

This instrument was acknowledged before me this 12 day of JUNE, 1954 by John Sherman Bagg, President, and A. L. SMITH, Secretary, of Mohave Metals, Mining and Reduction Corporation, a corporation duly organized and existing under the laws of the State of Arizona.

Nellie E. Smith
Notary Public in and for the
County of Mohave, State of
Arizona

My commission expires 6/2/55.

60459

Filed and Recorded at Request of

J. S. Bagg

June 12 A.D. 1954

at 40 minutes past 9 o'clock a. M.

in book 79 of DEEDS

Pages 69 - 70

Records of Mohave County, Arizona.

Peggy B. Smith
County Recorder

By .....
Deputy Recorder

PHOTO COPIED

INDEXED

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EXHIBIT #2

1+2

RECEIVED
OCT 26 1955

ASSIGNMENT OF LEASE

KNOW ALL MEN BY THESE PRESENTS: That the MOHAVE METALS MINING AND REDUCTION CORPORATION, a corporation duly organized under the laws of the State of Arizona, and in good standing, does hereby, for the sum of $IO (ten dollars) in hand paid the receipt of which is hereby acknowledged, and other good and valuable and sufficient consideration; sell., assign, set over and transfer, to the Uranium Corporation of Arizona, a corporation duly organized in the Stste of Dealware; all of its right, title and interest in that certain "AGREEMENT OF LEASE" dated March 6th I954, by and between the Pontiac Mines Incorporated, a corporation, incorporated under the Laws of the State of Nevada, and duly registered in the State of Arizona; and the MOHAVE METALS MINING AND REDUCTION CORPORATION. The aforesaid original lease is appended hereto and made a specific part of this assignment. The aforesaid lease is duly recorded in the records of Mohave County Arizona, in Docket Number 8 pages 258-265. Signed & Sealed May 25th I954 by

MOHAVE METALS MINING AND REDUCTION CORPORATION

BY John Sherman Bagg President
~~john sherman bagg pres~~

SEAL

STATE OF ARIZONA)
) ss.
COUNTY OF MOHAVE)

The above and foregoing ASSIGNMENT OF LEASE acknowledged before me this 25 day of May, 1954, by John Sherman Bagg, President of Mohave Metals, Mining and Reduction Corporation.

My commission expires:
May 1, 1958.

Notary Public.

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AGREEMENT OF LEASE

This agreement of lease made and entered into, in duplicate, this 6th day of March, 1954, by and between THE PONTIAC MINES INCORPORATED, a corporation, incorporated under the laws of the State of Nevada, and licensed to do business in the State of Arizona (hereinafter referred to as "the Lessor"), party of the first part, and the MOHAVE METALS MINING AND REDUCTION CORPORATION, a corporation, incorporated under the laws of the State of Arizona (hereinafter referred to as "the Lessee"), party of the second part.

WITNESSETH

That the said Lessor, for and in consideration of the rents, covenants, agreements, payments and royalties hereinafter reserved and by the said Lessee to be paid, kept and performed, has granted, let and demised, and by these presents does grant, let and demise unto said Lessee all the following described mine and mining property, situate in the Wallapai Mining District, Mohave County, Arizona, to-wit, the five (5) patented lode mining claims, the patents for which have been issued, and duly recorded in the office of the County Recorder of Mohave County, Arizona, known as and recorded in book and page on the dates, all as indicated:

NAME:	BOOK AND PAGE:	DATE:
1. Golconda	22-70	March 4, 1912
2. Virginia	26-510	April 28, 1917
3. Prosperity	19-570	January 3, 1910
4. Tub	14-118	February 25, 1901
5. Little Jimmy	78-45	January 9, 1954

and all other mines, mining property, and patented and unpatented mining claims, which the said Lessor now owns, or has an interest in, or to which title in said Lessor may hereafter be established,

situate and located in Sections Five (5) and Six (6), Township 22 North, Range 17 West, Gila and Salt River Base and Meridian, Wallapai Mining District, Mohave County, Arizona.

The rights hereby granted to the Lessee to the above described premises specifically include all extralateral rights, and the right to sort, screen, wash, sell and remove from said premises any portion or all of any dumps and tailings which are now located thereon or which may hereafter be placed thereon; together with all appurtenances, tunnels and mills.

To have and to hold the said demised premises for the purpose of mining, with exclusive possession and right of entry and operation to mine, develop, mill, and ship any and all ores that it may decide to mine, develop, mill, ship, or otherwise treat, for the term of fifty (50) years from February 1, 1954 to expire at noon on the 31st day of January, 2004, unless sooner forfeited or determined through violation of any agreement, covenant or condition hereinafter contained, to be kept and performed by the said Lessee.

In consideration of said lease, the said Lessee does hereby covenant and agree with the said Lessor as follows:

1. To pay all delinquent general property taxes on said premises; and to pay all general property taxes on said premises as they fall due during the period this lease is in force and effect. (The said Lessee has paid such taxes up to March 15, 1954.)

2. To pay for or perform all annual assessment work as required by law on any unpatented mining claims included in this lease, upon being so requested by the Lessor, and to complete such work prior to June first of each year.

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3. To pay and deliver, or cause to be paid and delivered to said Lessor, as a royalty upon all ores extracted and shipped or sold from said premises a royalty of five (5) percent of the net mill, smelter, sampler, reduction works, or other net revenues or returns, after deduction for transportation and treatment; said royalties to be paid monthly on the 15th of the month following the receipt of said revenues or returns by the said Lessee.

4. To pay and deliver, or cause to be paid and delivered to said Lessor, as a royalty upon all ores extracted and shipped or sold from the following unpatented lode mining claims, the property of the said Lessee, being situate in the Wallapai Mining District, Mohave County, Arizona, and location notices therefor filed in the office of the County Recorder of Mohave County, Arizona, under the names, in the books and on the dates as follows:

	NAMES:	BOOK AND PAGE:	DATE:
1.	Monitor	4B-125	May 17, 1951
2.	Monitor Extension	4B-126	May , 1951
3.	Monitor No. 1	4B-148	May 19, 1951
4.	Monitor No. 3	4B-152	May 19, 1951
5.	Monitor No. 4	4B-153	May 19, 1951
6.	Monitor No. 5 (see 12)	4B-149	May 19, 1951
7.	Monitor No. 6	4B-154	May 22, 1951
8.	Monitor No. 7	4B-155	May 22, 1951
9.	Monitor No. 8		
10.	Monitor No. 10		
11.	Monitor No. 5 (Amended)	4D-276	September 14, 1953

and from any other mines, mining property, or mine dumps and tailings, that the said Lessee may acquire by lease, purchase, gift, devise, descent, or location within the boundaries of said Sections Five (5) and Six (6), Township 22 North, Range 17 West, Gila and Salt River Base and Meridian, Mohave County, Arizona, a royalty of five (5) percent of the net mill, smelter, sampler,

reduction works, or other net revenues or returns, from said properties described in this paragraph, after deduction for transportation and treatment; said royalties to be paid monthly on the 15th of the month following the receipt of said revenues or returns by the said Lessee.

5. To pay to said Lessor, beginning January 1, 1955, the sum of Five Hundred Dollars ($500.00) per month, with 60 days grace on each payment, as a fixed and stipulated rental for said premises; said payments to be credited against and deducted from the payment of net royalties as provided in paragraphs 3 and 4 above, with annual settlement and adjustment.

6. To well and sufficiently timber with strong, well fitted and durable timbers, all the workings on the premises hereby leased at all points where proper, in accordance with good mining, and for ventilation, and to promptly repair or replace all timbering which may be rendered insufficient by any cause whatsoever; to keep the timbering of said workings at all times in good, safe and serviceable conditions.

7. To keep at all times all drifts, tunnels, shafts, winzes and other workings in said premises thoroughly drained and clear of loose rock and rubbish, and in an absolutely safe and secure condition, unless prevented by extraordinary mining casualty, and to maintain at all times and leave the floors of all drifts, crosscuts and other workings in good, even, unobstructed condition.

8. To allow the Lessor, its manager or any duly authorized agent or representative at any and all times: (a) to enter and visit all parts of said leased premises and the workings thereon for the purpose of inspection and taking of assay samples; (b) to take samples from any ores awaiting shipment;

(c) to have surveys made of the workings by the Lessor's surveyor and assistants whether under or above ground, or both, as often as the Lessor, its manager or any duly authorized agent shall so order, but at Lessor's cost, and also furnish to Lessor copies of blueprints of all surveys or maps made by the Lessee; (d) to afford the Lessor, its manager or any duly authorized agent, every facility, at all reasonable hours and times, for the inspection and copying of all books and records of said Lessee; and generally to facilitate in every way such inspection, surveys and samplings, as above provided.

9. To keep said premises and every part thereof at all times free and clear of all mechanics' or miners' liens or other liens, encumbrances or liabilities; to forthwith post, and at all times keep posted in some conspicuous place upon the premises hereby leased a notice that said premises are leased to the Lessee and that the interest of the Lessor therein shall not be subject to any lien for services, labor or material furnished upon or used in connection with this lease, or said leased premises, said notice to be on behalf and in the name of the Lessor with the signature of the Lessee also attached.

10. To assume all responsibility for and save the Lessor harmless from any and all accidents to any of its employees, sublessees, licensees, agents, associates or visitors, upon the property of the Lessor, as herein leased, and to forthwith post and at all times keep posted at the main working upon the premises hereby leased, a conspicuous notice in the name and on behalf of the Lessor, with the name of the Lessee also attached stating in substance that the premises are leased to the Lessee and that the Lessor will not be liable for damages on account of any such accident. The Lessor shall under no circumstances

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be liable to the Lessee or his agents, servants, employees, licensees, sublessees, associates, visitors or any other person, on account of any such accident.

11. To at all times fully comply with the provisions of the Workmen's Compensation Laws of the State of Arizona.

It is expressly understood and agreed by and between the parties hereto that all prior and contemporaneous oral and written agreements pertaining to the transaction herein are merged in this agreement, and that this agreement contains all existing agreements of every nature and kind pertaining to the transaction herein and connected herewith.

It is further understood and agreed by and between the parties hereto, as follows:

1. That upon the violation of any covenant or covenants hereinbefore reserved and on the part of the Lessee to be performed, the term of this lease shall, at the option of the Lessor, expire and terminate, and the same and said premises, with the appurtenances, shall become forfeit to the Lessor and the Lessor may thereupon, after demand of possession by registered letter specifying the violation, enter upon said premises and dispossess all persons occupying the same, unless the Lessee within thirty days after receipt of such demand shall have corrected the violation so specified.

2. That this lease shall extend to and be binding upon the successors and assigns of the parties hereto.

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4

securing the assent of the Lessor.

The Lessor warrants and represents that it is a corporation duly organized and existing in good standing in the State of Nevada; that it is duly qualified and in good standing as a foreign corporation in the State of Arizona; and that this lease has been executed with the consent of the holders of a majority of its outstanding stock or of such larger proportion as may be required by its certificate of incorporation.

IN WITNESS WHEREOF, the respective parties hereto have caused this instrument to be executed by setting their hands and seals thereto the day and year first above written.

LESSOR

THE PONTIAC MINES INCORPORATED

By _____
Alfred Luthi, President

ATTEST (SEAL)

_____
Reed Parkin, Secretary

LESSEE

MOHAVE METALS MINING AND REDUCTION CORPORATION

By _____
John Sherman Bagg, President

ATTEST (SEAL)

_____
Bernard T. Caine, Secretary

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STATE OF ARIZONA)
: ss.
COUNTY OF MOHAVE)

On this 6 day of March, 1954, before me, Peggy B. Smith, a Notary Public in and for Mohave County, Arizona, personally appeared John Sherman Bagg and Bernard T. Caine, to me personally known, who being by me severally duly sworn did severally say: that the said John Sherman Bagg is President and the said Bernard T. Caine is Secretary of the Mohave Metals Mining and Reduction Corporation, a corporation duly organized and existing; that the seal affixed to said instrument is the seal of said corporation; and that the said instrument was signed, sealed and executed in behalf of said corporation by authority of its board of directors; and the said John Sherman Bagg and Bernard T. Caine acknowledged the said instrument and the execution thereof to be the voluntary act and deed of said corporation by each of them voluntarily executed.

WITNESS my official signature and seal of office at Kingman, Arizona, the day and year last above written.

My Commission Expires January 2, 1957

(SEAL)

Peggy B. Smith
Notary Public in and for said County and State.

STATE OF Calif.)
: ss.
COUNTY OF Los Angeles)

On this 9th day of March, 1954, before me, James A. Bradley, a Notary Public in and for Los Angeles County, California personally appeared Alfred Luthi and Reed Parkin, to me personally known, who being by me severally duly sworn did severally say: that the said Alfred Luthi is President and Reed Parkin is Secretary of the Pontiac Mines Incorporated, a corporation duly organized and existing; that the seal affixed to said instrument is the seal of said corporation; and that the said instrument was signed, sealed and executed in behalf of said corporation by authority of its board of directors; and the said Alfred Luthi and Reed Parkin acknowledged the said instrument and the execution thereof to be the voluntary act and deed of said corporation by each of them voluntarily executed.

WITNESS my official signature and seal of office at Los Angeles, California, the day and year last above written.

(SEAL)

James A. Bradley
Notary Public in and for said County and State.

My Commission Expires August 6, 1957

Filed and Recorded at request of J. S. Bagg
March 11, 1954 at 9:45 o'clock A. M.
Docket No. 8, Pages 258 - 265
Records of Mohave County, Arizona.

PHOTO COPIED

Peggy B. Smith
Mohave County Recorder

59687

22/

7

EXHIBIT #1

SECURITY TITLE INSURANCE AND TRUST CO.
MASONIC TEMPLE - KINGMAN, ARIZONA

RECEIVED
OCT 26 1955

Northern Arizona Title Co.

Kingman, Arizona

Title Insurance Policy

No. K-219650 Amount $ 2,500.00

This Insurance Policy Witnesseth: That the Phoenix Title and Trust Company, a Corporation organized under the Laws of the State of Arizona, for a good and valuable consideration to it in hand paid, does hereby covenant that it will keep harmless and indemnify

PONTIAC MINES, INCORPORATED, a Nevada corporation,

against all loss or damage not exceeding

TWO THOUSAND FIVE HUNDRED and NO/100 ($2,500.00) - - - - - - Dollars, which said party insured shall sustain by reason of defects, at the date hereof, in the title of

PONTIAC MINES, INCORPORATED, a Nevada corporation;

as set forth in Schedule "A" hereto annexed, to the real estate or interest therein, described in said Schedule "A" (subject to any community property rights) or by reason of any lien or incumbrances affecting the same, at the date hereof, excepting only such liens, incumbrances and other matters as are set forth in Schedule "B" hereto annexed, subject to the conditions and stipulations hereto annexed and made a part hereof, and any loss shall be paid only upon compliance with said conditions and stipulations, and not otherwise.

IN WITNESS WHEREOF the Phoenix Title and Trust Company, by authority of its Board of Directors, has caused these presents to be signed by its duly authorized officers and its corporate seal to be affixed, this 10th day of May, A. D. 1954 at 8:00 o'clock a.m.

Phoenix Title and Trust Company

By Charles W. Nickle
President

Attest: O. C. Compton
Assistant Secretary

SCHEDULE A

1. The estate or interest insured hereby is in fee, unless otherwise herein stated, but, if the title holder named herein were married at the date such estate or interest was acquired, is subject to the community property rights, if any, of the then spouse of such title holder, or the successors in interest of such spouse.

2. Description of the real estate situated in Mohave County, Arizona, the title of which is insured by this policy:

The Tub Patented lode mining claim designated by the Surveyor-General as Lot #35, embracing a portion of SECTIONS 5 and 6, Township 22 North, Range 17 West of the Gila and Salt River Base and Meridian, in the Wallapai Mining District, Mohave County, Arizona, as described in that certain patent from the United States of America to T. L. Ayers, dated 16 February 1900 and recorded 25 February 1901 in Book 14 of Deeds, pages 118-120, records of Mohave County, Arizona.

The Virginia patented lode mining claim designated by the Surveyor-General as Survey #2889 embracing a portion of SECTION 5, Township 22 North, Range 17 West of the Gila and Salt River Base and Meridian, in the Wallapai Mining District, Mohave County, Arizona, as described in that certain patent from the United States of America, to the Union Basin Mining Company, a corporation, dated 4 May 1914 and recorded 28 April 1917 in Book 26 of Deeds, pages 510-512, records of Mohave County, Arizona.

The Golconda patented lode mining claim designated by the Surveyor General as Survey #2617 embracing a portion of SECTIONS 5 and 6, Township 22 North, Range 17 West in the Wallapai Mining District, Mohave County, Arizona, as described in that certain patent from The United States of America to the Union Basin Mining Company, a corporation, dated 11 September 1911, recorded 4 March 1912 in Book 22 of Deeds, pages 70-72, records of Mohave County, Arizona.

Prosperity patented lode mining claim designated by the Surveyor General as Survey #2427, embracing a portion of SECTION 6, Township 22 North, Range 17 West in the Wallapai Mining District, Mohave County, Arizona, as described in that certain patent from the United States of America to Owen McNeely, dated 9 March 1908 and recorded 3 January 1910 in Book 19 of Deeds, pages 570-573, records of Mohave County, Arizona.

The Little Jimmy patented lode mining claim, designated by the Surveyor General as Survey #3138, embracing a portion of SECTION 6, Township 22 North, Range 17 West in the Wallapai Mining District, Mohave County, Arizona, as described in that certain patent from the United States of America to the Union Basin Mining Company, a corporation, dated 13 August 1919 and recorded 9 January 1954 in Book 78 of Deeds, pages 45-49, records of Mohave County, Arizona.

SCHEDULE B

This Company does not insure against any of the following:

1. Any facts which a correct survey and inspection of said land would show; rights or claims of any parties in possession of any portion of said property, instruments, trusts, liens, easements, encumbrances and income or inheritance tax liens which are not shown by the public records in the offices of the County Recorder, County Treasurer and Ex-Officio Tax Collector, and Clerk of the Superior Court, of Mohave County, Arizona.

2. Proceedings for municipal improvements or for opening, widening or other changes in the streets and alleys of any municipality, and assessments, taxes and encumbrances created or levied by any municipality or by any Improvement, Irrigation, Public Utility, Sanitary, or other district unless the amount of the assessment or tax has become fixed and is shown as a lien at the date hereof by the records in the office of the Superintendent of Streets of the City in which the property is located, or of the County Treasurer of Mohave County, Arizona, and the effect of any zoning or other ordinance adopted by any governmental agency for the purpose of regulating occupancy or use of said land or any building or structure thereon.

3. 1954 taxes collectible through the office of the County Treasurer of Mohave County, Arizona, which said taxes are a lien upon said property but not yet due and payable.

4. Possible Easement for electric transmission line as evidenced by that certain Permit from The United States Department of the Interior to Desert Power & Water Company, dated 31 May 1919 and recorded 10 January 1920 in Book 13 of Miscellaneous, pages 389-394, records of Mohave County, Arizona.

5. The effect, if any, of that certain agreement between Desert Power and Water Company, an Arizona corporation and Golconda Mining Company, an Arizona corporation, dated 7 November 1925 and recorded 10 February 1926 in Book 16 of Miscellaneous, pages 456-460, records of Mohave County, Arizona.

6. Lease dated 27 November 1950, made by Pontiac Mines, Incorporated, a corporation and John Sherman Bagg, Term: 10 years, recorded in Book 1 of Dockets, pages 68-69, records of Mohave County, Arizona, and thereafter assigned to Mohave Metals Mining & Reduction Corporation by instrument dated 28 April 1953 and recorded 8 August 1953 in Book 7 of Dockets, pages 188-189, records of Mohave County, Arizona.

7. Trust Deeds executed by Highland Mining & Milling Company, an Arizona corporation, to C. J. Walters, Trustee, dated 25 September 1919 and 15 September 1921 and recorded 3 August 1921 and 7 January 1922 in Book 5 of Mortgages, pages 264-273 and pages 348-358, respectively, records of Mohave County, Arizona.

8. The rights of E. S. Clark, and wife, if any on 3 February 1927, under that certain Agreement for Sale between Golconda Mining Company, an Arizona corporation, and the said E. S. Clark, dated 3 February 1927 and recorded 7 April 1927 in Book 17 of Miscellaneous Records, pages 325-329, records of Mohave County, Arizona.

9. Lease dated 6 March 1954, made and executed by The Pontiac Mines Incorporated, a Nevada corporation, Lessor, and Mohave Metals Mining & Reduction Corporation, an Arizona corporation, Lessee, Term: 50 years, recorded 11 March 1954 in Docket 8, pages 258-265, as Fee No. 59687, records of Mohave County, Arizona.

CONDITIONS AND STIPULATIONS

This policy is issued and the liability of this Company is based upon the following conditions and stipulations:

1. The Phoenix Title and Trust Company shall have the right to, and will at its own cost and charges, defend the party insured in all actions of ejectment or other actions or proceedings founded upon a claim of title, encumbrance or defect which existed or is claimed to have existed prior in date to this policy and not excepted herein; reserving, however, the option of settling the claim or paying this policy in full; and the payment or tender of payment of the full amount of this policy shall determine all liability of this Company hereunder. In case any such action or proceeding shall be begun it shall be the duty of the party insured, at once to notify the Company thereof, in writing, and to secure to it, when practicable, the right to defend such action or proceeding, and to give all reasonable assistance therein. If such notice shall not be given to the Company within ten days after summons or other process in such action or proceedings shall be served upon the party insured, in person, then all liability of this Company in regard to the subject matter of such action or proceeding shall cease and be determined.

2. Whenever this Company shall have settled a claim under this policy, it shall be entitled to all rights and remedies which the party insured would have had against any other person or property in respect to such claim, had this policy not been made, and the party insured undertakes to transfer to the Company such rights and to permit it to use the name of the party insured for the recovery thereof. Any sum collected on such rights, over and above the amounts of loss paid by said Company, shall belong, and on demand, shall be paid to the party insured. The party insured warrants that such rights of subrogation shall vest in the Company, unaffected by any action of the party insured.

(Continued on Reserve Side)

3. Nothing contained in this policy shall be construed as a guarantee or insurance against loss or damage by reason of fraud on the part of the party insured, or by reason of claims, defects or incumbrances undisclosed of record arising under any action, deed, or trust relationship, created, suffered or permitted by or known to said party insured; or by reason of the fact that said party was not a purchaser for value, or that said party contravened the laws of the United States establishing a uniform system of bankruptcy in his acquisition of the estate or interests hereby insured; nor against any homestead rights of the spouse of the party insured not shown of record; nor will this Company be liable in any event for any loss or damage arising from the refusal of any party to carry out any contract to purchase, lease or lend money on the estate or interests insured.

4. Loss or damage by reason of special taxes, special assessments, water rentals or water taxes which have not been confirmed by a court of record, conveyances, mortgages, or agreements not of record at the date of this policy, or liens of material-men, mechanics, laborers and others, when no notice thereof appears of record, and are not covered by it.

5. A statement in writing of any loss or damage for which it is claimed this Company is liable shall be furnished to the Company within sixty days after such loss or damage, and no right of action shall accrue under this policy until thirty days after such statement shall have been furnished, and no recovery shall be had under this policy unless action shall be commenced thereon within two years after the expiration of said last mentioned period of thirty days; and a failure to furnish such statement of loss or damage and to commence such action within the times hereinbefore specified, shall be a conclusive bar against the maintenance of any action under this policy.

6. If a claim be made because of defect of title or of liens and incumbrances not excepted in this policy, the Company shall have the right to take the estate or interest insured at its then market value, irrespective of the alleged defect, lien or encumbrances, and shall be entitled to a conveyance thereof, with proper allowance for all defects, liens or incumbrances not insured against by this policy. In the event of disagreement as to the value, the same shall be fixed by a majority of three appraisers, one chosen by the Company, one by the insured, and the third by the two thus chosen; the valuation thus fixed shall be final and conclusive.

7. All sums paid under the provisions of any Mortgagee Title Insurance Policy issued by this Company heretofore or of even date herewith, or in connection with any mortgage hereafter executed by the party insured herein upon the premises herein insured, or any portion thereof, shall be deducted from the amount for which this Company is liable under this policy. All payments under this policy shall reduce the amount pro tanto, and no payment can be demanded without producing this policy for endorsement of such payment. If this policy be lost or destroyed, indemnity must be furnished to the satisfaction of the Company.

8. The Company will not be responsible for any deficiencies in the quantity of ground, or any conflict with the lines of adjoining property, or any divergence between the lines disclosed by the recorded title and the lines of the ground as used and occupied.

9. This policy is issued subject to the rights reserved in United States Patents, defects in title to water and ditch rights, whether the same are claimed under a recorded deed or otherwise; and the reservations, restrictions, limitations, and agreements set forth in the instrument by which title is vested in the party insured, and to all easements or servitudes apparent from inspection of the premises.

10. This Company does not by this policy insure any one other than the party insured against any loss or damage; provided that in the case of natural persons "party insured" shall include the executors, administrators, heirs or devisees of the named insured.

11. Whenever the party insured shall transfer the title to the property described in this policy, it may be surrendered and cancelled, and a new policy may, if the risk is accepted, be issued upon payment of the regular rates for continuation.

12. Nothing contained in this policy shall be construed as a guarantee or insurance to any one against defects, liens or encumbrances created subsequent to the date hereof, or created or suffered by the party guaranteed or insured; or as a guarantee or insurance against the effect of any change in, alteration of, or addition to the public records subsequent to the date hereof.

No. K-219650 Amount $2,500.00

Pontiac Mines, Incorporated.
Party Insured

Northern Arizona Title Co.

Title Insurance Policy

THIS COMPANY, IN ASSOCIATION WITH
SECURITY TITLE INSURANCE & TRUST
COMPANY, OFFERS
THOROUGH EXAMINATION OF TITLE
COMPLETE TITLE PROTECTION
SAVING IN TIME AND EXPENSE
GREAT EASE AND CHEAPNESS OF ALL
SUBSEQUENT TRANSFERS

TITLE INSURANCE BY
PHOENIX TITLE AND
TRUST COMPANY

Los Angeles, California,
March 28, 1919.

Mr. C. B. Bell,
Chloride, Arizona.

EXHIBIT #3

RECEIVED ENCLOSURE NO. 3

OCT 26 1955

Dear Mr. Bell: Re:

In accordance with our conversation of March 26th, I am handing you herewith data on the Golconda Mine, with statements of our operations and mine and property maps.

As shown on the first statement, the Golconda Mine produced thirty-one million pounds of zinc, with gold and silver values, during the three years we operated it, for which we were paid $2,117,433.00, and received $1,761,126.00 net from the smelter after deducting freight and smelting charges. You will note a great increase in the residue (gold and silver) values; during 1915 we received $34,765.78 for residues in 13,513 dry tons shipped, an average of $2.57 per ton, and in 1917 we received $111,003.02 for residues in 11,735 dry tons shipped, an average of $9.46 per ton. This high precious metal value is a factor of great moment in the operation of a zinc mine.

A statement of our 1917 operations giving the tonnage mine, milled and produced is also attached, so that you may have actual data of our last operations up to the time of the destructive fire, which destroyed the entire milling plant and mine bins on October 4th, 1917. We immediately engaged mill designers and proceeded to draw up plans and specifications for a new mill, but after nearly three months' time, in which these plans were practically completed, it was finally decided not to rebuild the plant at that time, due to the very greatly increased cost of labor, machinery and materials brought about by the war, the uncertainty of equipment deliveries and consequent unusual length of time it would take to rebuild the plant under the extraordinary conditions at that time, the uncertainty of the spelter market and the high cost of producing spelter. It was not considered likely that mine operations would be resumed until after the war and before conditions were again normal, which it was then believed would require four or five years' time; and we, therefore, dismantled the entire mine plant and disposed of the equipment with the idea of resuming mine operations with a plant at the 500 tunnel level, instead of at the collar of the shaft, and with new and more modern equipment suitable for our mine operations.

Regarding ore reserves, we did not make any detailed estimate, owing to the fact that development work had not been sufficiently advanced, and the mine is not in shape for any one to estimate actual ore reserves. Perhaps you will understand this better if I mention that during the high price of zinc, we made every effort to produce every pound the mine could stand, sacrificing development work for the momentarily high prices of zinc, and at the time of the fire the development work was just reaching a stage where we would be able to block out larger areas than had ever been done in the history of the mine. By referring to the stope map, you will note that the shaft is below the 1400 level, thus making available 300 feet of ground below the 1100 level and we were just ready to start drifting on the 1400 level when the fire terminated operations.

In line with former ore estimates, we based our conclusions of ore reserves on the continuance of the ore zone and past operations of the mine, which had been borne out by our results. The Golconda vein has produced about 20,000 tons of concentrating ore for each 100 feet of depth along the vein below the 700 level. Using this basis for the ore zone opened for more than 300 feet below the 1100 level, there should be

60,000 tons of concentrating ore in the stoping zone along the Golconda vein above the 1400 level. The Tub vein also offers attractive possibilities, and while it is true that we did not work along this vein during the last year of our operations, our final study of this vein (when we had more time for such investigations after the fire) lead us to believe that the Tub workings of the 700 level were unattractive due to being in a fault zone which closely follows in dip and strike the course of the Tub vein. Further development of this vein will undoubtedly show a continuance of the large ore-bodies opened above, also an extension of the Golconda vein southward beyond the intersection with the Tub fault shown on the 700, 800, 900, 1000 and 1100 levels.

As far as ore reserves are concerned, when we took over the property we estimated slightly over 5000 tons of concentrating ore as actually blocked out - not much more than one months' operations, but this did not discourage us as we were well aware of the previous history of the mine as far as ore reserve was concerned, and it is a fact that we mined at the rate of more than 4000 tons a month for nearly three years after taking over the property.

The results of development work so far on the 1200 level - the lowest level in the mine - were disappointing but not altogether discouraging as we had seen similar conditions on practically every one of the lower levels, such as the 900, 1000, and 1100 levels, and yet obtained our full quota of ore from the stoping areas above these levels. It is a singular fact that development headings all told at Golconda were rarely attractive or conducive of any great expectations of ore returns, and yet the mine has produced fully 70,000,000 pounds of zinc with gold and silver values. Against the unattractiveness of the 1200 level drifts is the fact that about 15 feet below the 1200 level a body of high grade was entered in the shaft which opened to a width of 6 feet of solid high grade ore and continued for about 60 feet in depth. This exemplifies a condition which is found throughout the mine, and the fact that these ore bodies are usually continuous in the ore zone and have only local pinches, is the reason that the entire ore zone is eventually stoped out in the operations above each level.

On the property map attached, the Virginia, Tub, Golconda and Prosperity claims are already patented. We are awaiting patent papers on the Little Jimmie claim, and the other claims have all been surveyed for patent and are now in process of being patented.

Yours very truly,

(signed) John D. Wanvig, Jr.

Supt. Union Basin Mining Co.,
Golconda, Ariz. P.O. Chloride, Arizona.

SMELTER RETURNS AND PRODUCTION
OF UNION BASIN MINING COMPANY.

	1915	1916	9 mos. 1917	TOTAL
Amt paid for Zinc shipped	$684,486.83	$718,640.90	$488,958.66	$1,892,086.39
Amt paid for Residues	34,765.78	79,578.12	111,003.02	225,346.92
Total paid for Metals	719,252.61	798,219.02	599,961.68	2,117,433.31
RR Freight to Smelters	130,486.82	126,708.76	99,111.34	356,306.92
Net Smelter Returns	588,765.79	671,510.26	500,850.34	$1,761,126.39

TWO YEARS NINE MONTHS WORK

SMELTER RETURNS AND PRODUCTION

	1915	1916	9 mos. 1917	TOTAL
Amt paid for Zinc ship'd	$684,486.83	718,640.90	488,958.66	$1,892,086.39
Amt paid for Residues "	34,765.78	79,578.12	111,003.02	225,346.92
Total paid for Metals	719,252.61	798,219.02	599,961.68	2,117,433.31
R. R. Frt. to Smelters	130,486.82	126,708.76	99,111.34	356,306.92
	$588,765.79	671,510.26	500,850.34	1,761,126.39
Dry Tons Shipped	13,513	13,410	11,735	38,658
Pounds Zinc Contained	10,601,501	10,689,576	9,884.829	31,175,906
Ounces Silver	106,308	130,196	149,208	385,532
Ounces Gold	4,547	6,216	6,735	17,498
Av'ge Spelter Quot. per lb ¢	11.017	11.678	9.046	10.619
Av'ge Silver " per oz ¢	50.002	67.558	79,980	

1917 OPERATIONS (9 months)

MINING

DEVELOPMENT WORK - Advanced		3,857 feet
MINED - Concentrating Ore		33,959 Dry Tons
High Grade Ore		34 " "
Total Ore Mined		33,993 "
From Development Work		8,650 "
From Stoping		25,343 "

MILLING

GRADE ORE - Treated		33,786 "
Sorted - High Grade Ore	37	
" - Waste	1756	1,793 "
Ore Milled		31,993 "
Concentrates Produced		9,168 "
DUMP TAILINGS: Treated		25,656 "
Concentrates produced		2,088 "
Total concentrates produced		11,256 "

FEED ASSAYS: Crude Ore	14.3% zinc
Dump Tailings	6.0% "
RECOVERIES: Crude Ore	87.5%
Dump Tailings	53.1%
RATIO OF CONCENTRATION:	
Crude Ore	3.49 into 1
Dump Tailings	12.29 " 1

1917 OPERATIONS (9 months) Continued.

PRODUCTIONS

High Grade Ore	71 Dry Tons
Concentrates	11,256 "
Total Productions	11,327 "

SMELTER SHIPMENTS AVERAGED:

Zinc	42.12%
Gold, ounces per ton	.57
Silver " " "	12.70
Iron	9.93%
Manganese	.66%
Insoluble	12.13%
Lead	1.38%
Copper	1.33%

EXHIBIT #10
LEDOUX ASSAYS

LEDOUX & COMPANY,
(Inc.)
ENGINEERS, CHEMISTS AND ASSAYERS
ALFRED AVENUE TEANECK, NEW JERSEY

RECEIVED
OCT 26 1955

RP **REPORT OF ANALYSIS**

No. 726573 Teaneck, N. J. Sept. 19, 1955

Our analysis of the sample of MINERAL

From Arizona Golconda

Marked: Sample from 18" vein Golconda-Peach Drift taken Aug. 24, 1955

andsubmitted to us, shows

After drying:

Lead - - - - - - - - -	21.76%
Copper - - - - - - - -	0.87%
Zinc - - - - - - - - -	19.58%
Silver - - - - - - - -	18.86 ozs. per ton of 2000 lbs.
Gold - - - - - - - - -	0.02 ozs. per ton of 2000 lbs.

By Spectrographic Analysis:

Indium - - - - - - - -	Trace less than 0.002%
Germanium- - - - - -	Not Detected

Note: Chemical analysis by single determination.

* * *

To Arizona Golconda Mines, Incl.

LEDOUX & COMPANY, Inc.

10

STANDARD CODES · Cable Address: "ACCURACY"

John Herman Laboratory

771 San Julian Street, Los Angeles, California

TELEPHONE: VAndike 6232 · U. S. A. · ORE TREATMENT TESTS

Certificate of Spectrographic Qualitative Analysis

Made for Mr. H. B. Lawerence, *Date* February 4th, ~~1940~~ 1939.

EXHIBIT #13

Element	Estimated Quantity
Silicon	Over 10.0%
Zinc	10.0%
Iron	1.0 to 10.0%
Lead	1.0%
Copper	0.1 to 1.0%
Manganese	0.1 to 1.0%
Aluminum	0.1 to 1.0%
Calcium	0.1%
Indium	0.1%
Cadmium	0.1%
Bismuth	0.1%
Magnesium	0.01 to 0.1%
Germanium	0.01 to 0.1%
Silver	0.01 to 0.1%
Potassium	0.01%
Sodium	0.01%
Arsenic	0.01%
Cobalt	0.01%
Titanium	0.001 to 0.01%
Gold	0.001 to 0.01%
Tin	0.001%
Vanadium	0.001%

RECEIVED OCT 26 1955

Paid.

Estimated Quantities to the nearest Factor of Ten.

ALL VALID CERTIFICATES BEAR THIS SEAL

John Herman
CHEMIST

(OVER)

Affidavit

GENERAL

STATE OF CALIFORNIA,
County of Los Angeles } ss.

Alfred F. Luthi

BEING FIRST DULY SWORN, deposes and says:

That he is the President of the Pontiac Mines Inc., a Nevada Corp. offices of which are located at 18008 S. Western Av., Gardena, Calif.

At the time the original Spectographic Qualitative Analysis was made, Mr. H. B. Lawerence was the President of the Corp. He has since deceased. The analysis was made of ore which came from the Goldconda Mine in the Walapie District located between Kingman & Cloride, Ariz.

Mr. Lawerence passed away in 1944 and Mr. Alfred F. Luthi has been President ever since that time.

Mr. Lawerence had the analysis made for the Pontiac Mines Inc. and the original has been in our files and in our records since the date of the original document.

Attached you will find a photostatic copy of the original document.

x Alfred F. Luthi

SUBSCRIBED and sworn to before me this 27 day of November, 19 54.

x Mildred Berg
Notary Public in and for said County and State.

(NOTARIAL SEAL)

AFFIDAVIT—GENERAL—WOLCOTTS FORM 292—REV. 12-50 · 53484

21 East 40th Street
New York 16, N. Y.

June 7, 1955

Mr. John C. Foster
44 Wall Street
New York, N. Y.

Dear Mr. Foster:

In accordance with request by you and Mr. Percy E. Landolt, I flew to Kingman, Arizona on May 26, 1955 where I was met at the airport by Mr. John Sherman Bagg, Mining Engineer in charge, who took me to the Company's attractive guest house and extended me genuine hospitality and cooperated in every way showing me over the Company's properties and many other points of interest in the district; also giving me much pertinent information regarding the history of and the probable values in the Golconda group of mines.

The next day we drove to the Golconda shaft area, inspected the ruins of the headframe and bins, the ore left on the dump which was left after the bins burned in October 1917, and all ore and tailings dumps in that area which might yield profits from beneficiation. We agreed upon methods for taking samples representative of the values in each dump and went underground in each adit or tunnel where work should first be resumed for dewatering the mine and for obtaining earliest possible samples of ore in place for metallurgical tests, estimates of income; also for early mining if this is justified by metallurgical results and estimated costs. The next two days were spent looking over the proposed site four miles out of Kingman for locating the FluoSolids plant for roasting the concentrates and electrolytic winning of the copper and zinc in the calcines; and looking at many mines with similar ore occurrences and metallurgy which could be of interest when and if the Golconda project proves successful.

The Golconda Mine is located in the Wallapai mining district of Mohave County, Arizona, about 10 miles north of Kingman, a town of about 3500 population on U.S. paved highway 66. The town is served also by two branches -- one going East, and the other West of Sante Fe Railroad; has gas from El Paso Natural Gas Company, and receives its power from Tucson Power & Light Company. Boulder Dam power lines run across the mine property. The elevation at the collar of the shaft is 4375' and at the proposed mill site about 3375'. Typical Arizona climate prevails -- high temperatures in summer and mild in winter; humidity and rainfall are low all the year and in summer the nights are cool so one can always sleep. The water is excellent. I can't think of a place where climate and health conditions would be more favorable for living and for operating a mine.

THE MINE.

The ore was discovered near the top of the mountain and the shaft sunk from there to a depth of 1400 feet with levels at 100 foot intervals down to the 1100 foot level below which the estimated tonnage of ore for stoping is 20,000 tons per level or 60,000 tons. Above that level there are said to be some 35,000 tons available which have not been mined out.

To obviate the prohibitive expense of hoisting the ore and pumping all the water 1400 feet up the shaft and then getting it down again, present plans are to drive a connection from the end of the Peach Tunnel which is now some 2550 feet long to the 1,000 foot level of Golconda shaft which is on the same level. All ore and water will come out by gravity from this tunnel and be fed into the mill located near and slightly below its portal so that ore cars will dump directly into the mill bins. Please refer to map Enclosure No. 1.

Ore Values. At the present time the shaft and all other openings into the mine are caved so the only way to obtain the actual values is to reopen different entrances to the mine on different levels and take samples of the ore in place. The following program has been agreed upon to obtain quickest information regarding grade of ore, also as much knowledge as possible about the different minerals -- especially germanium, indium, uranium which have been found by assay to occur in small quantities in the ore:

1. Obtain samples of every ore dump and waste dump on the surface. These samples will be assayed by Ledoux and Company and later used for making metallurgical tests for upgrading the values. The samples have already been taken at the request of Mr. Landolt and are on the way to Ledoux and Company.

2. Open 500' level. Please refer to map Enclosure No. 2. The portal of this tunnel has already been cleaned out to the intersection of the adit with the Tub vein which caved at this place. It is probable that but a few sets of timber will be required to get through the cave after which entry can be made to the workings in the Tub vein and also 500 foot level of Golconda.

3. Open up Primrose Tunnel on 600 level. Here and in the 600 Prosperity Tunnel the Atomic Energy Commission geologists made Scintillometer surveys in February 1953 which showed occurrences of uranium in many places. The actual chemical analyses of uranium on Primrose Tunnel averaged .0423% U_3O_8 or 0.846 pounds per ton of ore. If uranium is upgraded four or five times, these small amounts might contribute a substantial credit per ton of concentrates and the same would apply to germanium and indium which have also been found in small quantities in Golconda ores.

The following assays are taken from a Certificate of Spectrographic Analyses made February 4, 1939 from Golconda ores by John Herman Laboratory, 771 San Julian St., Los Angeles, California. The certificate is signed and sealed by John Herman, Chemist, -

Zinc	10%
Lead	1%
Indium	0.1%
Germanium	0.01 to 0.1%
Silver	.01 to 0.1%
Gold	0.001 to 0.01%

The metallurgical program for recovering these values is in the hands of Mr. Percy R. Landolt, Chemical Engineer, and considerable new information will be available as his tests on samples already shipped get under way.

4. Drive Peach tunnel connection. As you can see on the maps, Enclosures Nos. 1 and 2, this tunnel is a very valuable asset for economic mining, ventilation, handling of the ores to the mill, and for unwatering the mine. At the present time there are between 200 and 400 feet of water above the 1,000 level where the Peach Tunnel extension will connect with the Golconda drift. An attempt will be made to determine accurately the level of the water by lowering a weight down an air pipe from the collar of Golconda Shaft as soon as it is repaired and safe. Mr. Bagg plans to keep a pilot drill hole ahead of the face of Peach Tunnel extension when it is nearing connection with the 1,000 foot Golconda drift. To avoid any possibility of breaking into water, I recommend that this be started when the tunnel extension is not more than 400 feet from connection; and when within 200 feet two additional pilot holes be kept about 6 feet ahead of the other holes each round -- one up 15° from the plane of the back, and the other down 15° from the plane of the bottom of the tunnel.

Mr. Bagg has signed a contract with Mohave Metals Mining & Reduction Co., incorporated under the laws of Arizona - Kingman, Arizona:

To drive this tunnel at a cost of $35. per foot. The contractors are to furnish all operating equipment, compressors, power loaders, drills, explosives, labor, cars, locomotives, blowers, etc. The Golconda Company are to furnish the rails, ties, track spikes, fish plates,

3" air line (which will be laid from the contractor's compressor near "Shaft of the main tunnel" - (See Enclosure No. 1) - throughout the driving of the tunnel connection). The Golconda Company will also furnish the ventilation pipe which will be installed by the contractor who will furnish blower and power to run it. Contractor furnishes bond to insure the carrying out of the entire contract. Length of connection is about 1800 feet.

It is proposed to start driving this connection drift in the Golconda vein. I recommend that if the vein is found to deviate, split, or change direction often the balance of the tunnel extension be driven straight on survey lines so that it may be as perfect a haulage tunnel as possible. Short crosscuts could be driven to the vein every 200 feet to keep connecting tunnel as near to vein as possible. Right from the start this tunnel extension will have good ventilation because it starts but a few feet from the shaft marked on Enclosure No. 1 "Shaft of the Main Tunnel" which connects with the surface.

Note: Locate air compressor here instead of at Portal. It will save purchase and installation of 2100 feet of 3" pipe and yield better pressure.

Records of Previous Operations. The best evidence I have found of the grade of ore and its probable continuance in depth is from the letter (Enclosure No. 3) from Mr. John D. Wanvig, Jr. dated March 28, 1919 to Mr. C. B. Bell outlining the actual grade and tonnage mined the first 9 months of the year 1917. I found the following lengths of ore on each level from a section map enclosed with this letter:

Level	Approx. length of ore
100 foot	490 feet
200 "	350 "
300 "	950 "
400 "	1050 "
500 "	1000 "
600 "	1150 "
700 "	815 "
800 "	760 "
900 "	1100 "
1000 "	1200 "
1100 "	1120 "
1250 "	Not completed

This shows that the length of ore has held up in depth and the mine should continue to produce 20,000 tons per level below the 1100 level. It should be kept in mind that the shaft will need be sunk 100 feet for each 20,000 tons of ore mined.

For the 9 months' period the average grade of the 31,993 tons of crude ore treated was 14% zinc 87.5% of which was recovered making available for leaching 238 pounds of zinc. If 85% of this

were recovered as electro zinc the yield would be 208 pounds of zinc which at present market of 12¢ per pound would yield from zinc alone $24.96 per ton of ore mined. Besides this there are around 1% lead, 1% copper. Mr. Wanvig's report states the gold and silver values in the ore increase in depth but I can't check that because in 1917 they treated 25,656 tons of dump tailings besides the 31,993 tons of crude ore and some high grade ore shipped direct to the smelter.

GENERAL.

Water. Another asset of Golconda Mine is water. In 1917 they treated in the mill by jig and table concentration an average of 118 tons of crude ore per day plus 95 tons of tailings per day, a total of 213 tons per day. This shows that the water available at the mine is very ample for treating present contemplated rate of ore production which I understand is 100 tons per day. In addition to this the present Peach Tunnel is producing about 7 gallons per minute. If the water should be needed all of the water now in the mine could be tapped when the Peach Tunnel holes through and drained directly into the crosscuts off the main Peach Tunnel. All that would be needed is to make a concrete dam across each crosscut and a vent to let the air out as the water goes in.

Site for Refining Operations. Mr. Bagg showed me the site which has been proposed for carrying on roasting of the concentrates and electrolytic winning of the copper and zinc from the calcines. It is located about 3 miles from town between the two branches of the Sante Fe Railroad -- one going east, and the other west. The paved highway also goes through the tract. In the middle of the tract is an 85' deep well which will insure a constant water supply of 80,000 gallons a day or about 55 gallons a minute. Water will also be available from Kingman Water Supply. The Sante Fe Railroad have assured Mr. Bagg that they will put a spur into the plant and will reserve this for Golconda Company. Cost of the 80 acre tract less the acreage in the highway and railroad tract will be approximately $15,000. Included in this is a house in which the pumpman lives. This site is approximately 20 miles from the mine. Cost of transporting concentrates from the mine approximately $1.50 per ton. This is an excellent site and would be especially convenient for receiving ores for Golconda and other companies. Naturally the purchase would not be made until the metallurgical tests have been completed and the grade of the ore ascertained.

Power. Power previously was furnished by Hoover Dam but for some reason the contract lapsed so at the present time power is furnished altogether by the Tucson Power & Light Co. who give the following as the maximum and the minimum rates which Golconda will have to pay:

Maximum	2.4¢ per Kwh
Minimum	1.29¢ per Kwh

To both rates a tax of 1% should be added.

As Hoover Dam power lines cross the Golconda Mine property, it would be advisable to attempt to get back this cheaper power which was allocated to the Los Angeles area. Estimates should also be compiled showing cost of making our own power:

a. with natural gas in Diesel engines, and

b. with gas turbines with the view to getting lowest possible costs for Tucson Power & Light Co. power.

It would be inadvisable for the Company to run its own power plant unless the rates are exceedingly unfavorable.

Rough estimates based on previous management's confidence ore will continue downward with same or better values than that treated in 1917. The previous management of Golconda considered the mine solely as a zinc mine and give in their data shown in Mr. Wanvig's letter, Enclosure No. 3, the grade of zinc in the heads. As they do not give the values of copper, lead, gold and silver in the heads, I have attempted to establish a proper relationship of copper, gold and silver to zinc in the heads based on their respective relationships shown in the smelter shipments during 1917.

	Per Average Ton of Smelter Shipments 1947
Average pounds of Zn per ton of concent.	842
Estimated average pounds which would be recovered by FluoSolids roast, leaching calcines and electrolytically winning the zinc @ 85% recovery	715.7
Average pounds of copper per ton shipments	26.6
Average pounds Cu/ton concs. - by FluoSolids and electro-winning @ 75% rec.	19.95
Value of electro Cu recovered/ton conc. @ 36¢/#	$ 7.18
Value of elec. copper per pound electro zinc recovered $7.18 ÷ 715.7 =	$ 0.01

Note: for each pound of zinc recovered there will be a one cent credit in respect of each pound of electro copper produced.

Av. oz. silver in concentrates	12.702
Av. recovery by cyanization of elec. tank sludges	10.16 oz.
Av. value of silver in conc. @ 90¢ per oz.	$ 9.14
Av. oz. gold in concentrates	0.57
Av. oz. gold recovered by cyanization of elec. tank sludges @ 80%	0.456 oz.
Av. gold value per ton concts. @ $35.00 per oz.	15.96
Av. silver plus gold values per ton conc. ($9.14 + $15.96	$ 25.10
Av. silver plus gold credit per lb. electro zinc recovered (25.10 ÷ 715.7)	0.0307

<u>Note:</u> for each pound of zinc recovered, there will be a credit in respect of gold and silver of 3.07¢.

The above is based on the assumption we are treating a zinc ore and will have the same credits to each pound of zinc recovered as electro zinc as would have been recovered from the concentrates in 1917 if they had roasted them, leached the calcines and electrolytically won the copper and zinc and recovered the gold and silver from the tank house sludge by cyanization.

Applying the figures derived above to the actual grade of all the ore mined in the last year of operation, 1917, the following income would be derived if the ore left in the mine has the same average grade as produced in 1917.

Grade of ore 14% Zinc 280 lbs./ton	
Pounds electrolytic zinc produced (see p. 5 lbs. per ton ore)	208 lbs.
Value of Zinc per ton ore @ 12¢/lb.	$ 24.96
Copper credit @ 1¢ for each lb. zinc 205 x $.01	2.05
Gold plus silver credit @ 3.07¢ per pound Zinc (205 x .030)	$ 6.29
Credit in respect of lead (1% in concts.)	0.00
Total value of recovered zinc, copper, gold and silver in each ton of average ore.	$ 33.30

The estimates indicate that if the ore maintains its value in depth as the previous superintendent, Mr. Wanvig, predicted, the property could with present prices and efficient operation be run as a zinc mine with copper, gold and silver values, without any credit for the following valuable minerals:

Germanium selling at $294.84 per pound. Spectrographic analysis on Page 3 shows .01% (equals 2/10th of a pound per ton) to .1% (equals 2 pounds per ton of ore).

Indium selling at $2.25 per troy ounce or $39. per pound. Spectrographic analysis Page 3 shows .1% (equals 2 pounds) of indium per ton of ore.

Uranium - the selling price varies according to grade. Atomic Energy Commission obtained by chemical analyses 0.84 pounds U_3O_8 per ton of ore. This will need be concentrated to receive payment.

We will not know what percent of each of these valuable minerals will be recovered until the metallurgical tests are run on many representative samples of mine ore and accurate assays of each are made. If any one or more of these are found in greater quantities and respond favorably to concentration, the income and profits would be many times greater than operating as a zinc mine without these valuable minerals.

The plans for opening the mine on the different levels for obtaining reliable samples for metallurgical tests and for moving into production if samples and recoveries are favorable appear sound.

Very truly yours,

Frank A. Ayer

Frank A. Ayer
Consulting Mining Engineer

FAA-KH

EXHIBIT #7

RECEIVED OCT 26 1955

LEDOUX & COMPANY
INC.

TELEPHONE TEANECK 7-7160

359 ALFRED AVENUE
TEANECK NEW JERSEY

CABLE ADDRESS "LEDOUX TEANECK"

INDEPENDENT CONTROL & RESEARCH CHEMISTS, SPECTROSCOPISTS - SAMPLING, WEIGHING & SHIPPERS' REPRESENTATION

July 15, 1955

Mr. Percy E. Landolt
Landolt & Whitney
36 West 44th Street
New York, New York

Re: L. & Co. No. 723445

Dear Mr. Landolt:

We are able to report the following findings on the samples sent us by Arizona Golconda Metals Corporation:

Sample #	Zinc	Lead	Copper	Silver *	Gold *	
1	32.56%	1.13%	3.57%	24.52 oz.	1.48 oz.	= 150.81
2	40.82	0.90	3.63	31.76	0.84	= 188.09
3	38.43	0.81	1.58	11.30	0.50	= 140.39
4	43.71	2.36	0.75	4.92	0.40	= 141.52
5	40.82	0.83	2.78	18.54	0.64	= 168.64
7	37.73	0.82	0.83	15.10	0.10	= 121.34
9	36.19	7.53	0.94	11.42	0.38	= 145.10
10	to come	4.70	0.39	8.60	0.40	
11	20.96	3.28	0.51	7.04	0.16	
12	18.42	10.33	0.80	17.32	0.36	
13	31.36	1.56	0.51	10.16	0.12	
15	to come	0.42	0.23	1.56	0.09	
16	" "	0.10	0.12	0.60	0.06	
17	" "	0.18	0.13	0.68	0.04	

* oz. per ton of 2000 lbs.

#6 45.42% 2.08% 2.16% .15 oz 80 oz = 187.16

You will note four of the zinc determinations are still to come. They will be telephoned to your office when available. Then the formal reports will be mailed.

Average 160.00 Total

Very truly yours,

LEDOUX & COMPANY

W C Bowden

W. C. Bowden
Secretary

WCB/jmg

75th Anniversary ~ 1880 ~ 1955

TELEPHONE
WHITEHALL 3-9361

MINE
KINGMAN, ARIZONA

EXHIBIT II 8

ARIZONA-GOLCONDA METALS, INC.
SUITE 718
80 WALL STREET
NEW YORK 5, N. Y.

RECEIVED
OCT 26 1955

June 29, 1955

Ledoux & Company's laboratory reported on sample # 6 received from Kingman as follows:

Zinc	(zn)	49.42 %	988 lbs.	.12½¢	$ 123.50
Lead	(Pb)	2.08	41 6/10 lbs.	.15	6.15
Copper	(Cu)	2.16	43 2/10 "	.36	15.55
Gold	(Au)	0.80 oz. per ton		35.00	28.
Silver	(Ag)	15.52 oz. per ton		.90	13.96
Gross Value per ton of Ore					$ 187.16

Priced on basis of today's market value.

We have not thus far asked for, but I think we should ask Ledoux to make an analysis for Cadmium. Cadmium is also important and valuable and may be expected to be present in the complex ore of the character we are dealing with at Kingman.

(Signed) Percy E. Landolt
Consulting Engineer

EXHIBIT #9
H.E.C. Assays

UNITED STATES
ATOMIC ENERGY COMMISSION
DIVISION OF RAW MATERIALS
SALT LAKE EXPLORATION BRANCH

ADDRESS:
U. S. ATOMIC ENERGY COMMISSION
P. O. BOX 2196
SALT LAKE CITY, UTAH

RECEIVED
OCT 26 1955

AND REFER TO:

SLEB:LJC:ff

April 6, 1953

Mr. John Sherman Bagg
Natural Resources
Kingman, Arizona

Dear Mr. Bagg:

Following are the assay returns on the samples listed on the maps of the Primrose and Prosperity Tunnels which were forwarded to you last week:

Sample No.	% cU_3O_8	% eU_3O_8
F-8147	0.138	0.094
F-8148	0.029	0.024
F-8149	0.011	0.012
F-8151	0.010	0.006
F-8152	0.019	0.036
F-8153	0.018	0.017
F-8155	0.041	0.037
F-8156	0.058	0.035
F-8157	0.033	0.025
F-8158	0.005	0.002
F-8159	0.035	0.038
F-8160	0.025	0.027
F-8161	0.128	0.075

Sincerely yours,

Lloyd J. Conklin

Lloyd J. Conklin, Acting Chief
Salt Lake Exploration Branch
Division of Raw Materials

5

EXHIBIT #11

RECEIVED
OCT 2 6 1955

PROGRESS REPORT #1

ARIZONA-GOLCONDA METALS, INC.

80 WALL STREET, NEW YORK 5, N. Y.

September 2, 1955

TELEPHONE
WHITEHALL 3-9361

MINE
KINGMAN, ARIZONA

ARIZONA-GOLCONDA METALS, INC.
80 WALL STREET, NEW YORK 5, N. Y.

An old mine has become a rich new ore source

Though giving every evidence of the presence of rich and large bodies of ore, the properties on your Company's 275-acre claims had not been worked for almost 40 years until Arizona-Golconda Metals, Inc. began operations. Mining had been abandoned in 1917, when the mill and ore bins at the Golconda shaft were destroyed by fire. At that time, all evidence pointed to the existence of very large ore bodies with a high content of copper, lead, zinc, gold and silver. When the mine burned, considerable quantities of ore remained undeveloped and lay in dumps and tailings around the mine works.

The presence in the ore of special metals – such as germanium and indium – and of uranium should add appreciably to the values of the previously known base and precious metals.

A long-abandoned tunnel seems likely to lead to large deposits

Among the four main tunnels which had been constructed on your Company's present properties during earlier mining operations, the Peach Tunnel offers the most expeditious route to actual ore production. This tunnel, which is 2,750 feet long, is a strategic approach to the mines ahead. Present plans are to extend the Peach Tunnel along the Golconda vein to the Golconda shaft, with its reported large quantities of rich ore.

And here are recent reports on progress and prospects

On the following pages of this report, you will find more detailed information on your Company's progress to date, its plans for the future and its financial condition.

First steps in clearing the mine

A summary based on reports from
JOHN SHERMAN BAGG
Managing Engineer
Arizona-Golconda Metals, Inc.

(Mr. Bagg has been engaged in geological and mining activities for more than 40 years, and is a former member of the staff of the U. S. Bureau of Mines. Recognizing, from his long and extensive experience, the rich mineral potentialities of the Kingman, Arizona area, he assembled the claims which now comprise your Company's properties. Mr. Bagg reports on progress to date in reactivating your Company's properties.)

The Peach Tunnel has been cleared

The Peach Tunnel which we have already mentioned was choked with muck, slime and timbers when we began our operations. We have concentrated much of our initial work on this tunnel, since its opening up is clearly the most direct way to the start of mining operations likely to prove profitable.

With clearing operations completed, we will push ahead as rapidly as possible from the original tunnel face toward the Golconda 500 and 1000 levels.

Track has been laid

As the clearing-out operations proceed, track is being laid in the Peach Tunnel for the compressed air locomotive and the cars which are now carrying out the muck – and may soon be transporting ore.

The five cars which we first placed in service have now been supplemented by five newly purchased ones. This will permit the operation of two trains of five cars each – one train being emptied while the other is being loaded at the face of the tunnel.

This step is expected to double the rate of "mucking out" and speed the date of beginning of ore shipments.

Operational Plans

A summary based on reports made after personal inspection of the properties by
P. E. LANDOLT

(Mr. Percy E. Landolt is a professional engineer in the State of New York, graduate of the School of Mines, Columbia University, New York, 1912, with a degree of Chemical Engineering, and has had many years' experience of a diverse character in chemical engineering and metallurgical fields; is a member of a large number of professional societies in technological fields; is a past president of the Association of Consulting Chemists and Chemical Engineers, Inc., and has been a recognized consulting engineer over many years. He has had experience of varied character, including the lithium industry over many years, and is a Director of Lithium Corporation of America, Inc.)

Plans for facilities to recover metallic values

Based upon the work of assembling the properties of the Company by Mr. John Bagg, resident agent and mining engineer, and his present work of directing the rehabilitation of the workings and conduct of further exploration work underground with a skilled mining contracting organization to carry out such work, Mr. Landolt is convinced that the development of mined material will warrant the planning of suitable facilities to profitably recover the metallic values in the ore of this mine. Sufficient quantity of such mined material will be made available to make proper concentration and mineral recovery tests in order to confirm the most economical means of accomplishing this.

From the material on the dumps a careful sampling was made and some 17 samples were shipped East and analyzed by Ledoux & Company. On the advice of Mr. Landolt, Mr. Bagg selected material out of these dumps that would be most representative of at least partially concentrated material and the assays that were reported by Ledoux & Company bear out the opinions expressed by Mr. Ayer after his investigation and bear out predictions made from time to time by Mr. Bagg.

These samples for the most part showed analyses of the following character:

Zinc:	from	18	to 49%
Lead	from	.8	to 10%
Copper	from	.5	to 3.63%
Silver	from	5	to 31 ozs. per ton
Gold	from	.12	to 1.48 ozs. per ton

The material also showed traces of germanium and indium, which should be significant in the ultimate recovery of values, on suitable treatment, of the concentrates metallurgically.

In addition, on two of the dumps appreciable radioactivity was indicated, which on analyses proved to be .03 to .06% U_3O_8, but inasmuch as these were samples above ground, weathered over the years, it is more than likely that the radioactive material was leached out substantially in excess of what the analyses showed.

Studies being conducted on treatment methods

Pursuant to a personal inspection visit by Mr. Landolt to the mines, considerable study has been given to the means of properly treating this material metallurgically, and we have found that the Dorr-Oliver Company, of Stamford, Conn., would be prepared to make experimental runs on an appreciable scale on sample concentrates shipped to them from which they would be prepared to contract for a plant that would be quite complete to separate and recover the prime metallic constituents and to create concentrates from which the specialized or rare elements could be recovered economically. Other methods of concentration and separation are being studied so that a conclusion can finally be reached as to the best method of treating these complex mineral materials to obtain the most economical recovery of values, in order to realize the fullest values on the investment made.

It would appear from Mr. Landolt's observations and studies that the values that could be obtained from the properties in terms of the various metals indicated would present a suitable profit margin above the costs of mining and treating to warrant a substantial capital investment to achieve the optimum desired to get profitable returns on the mining and processing of the mineral materials.

The present exploratory work and the examination and studies for the design and specifications of suitable processes of concentration and recovery will take some time to prepare in order to do a thorough piece of work, but while it is difficult and somewhat hazardous to make a time schedule at this stage of the operation, it would appear that with the experimental findings to date and with suitable capital support that operations could be put in motion which a good realization could be made within approximately one year.

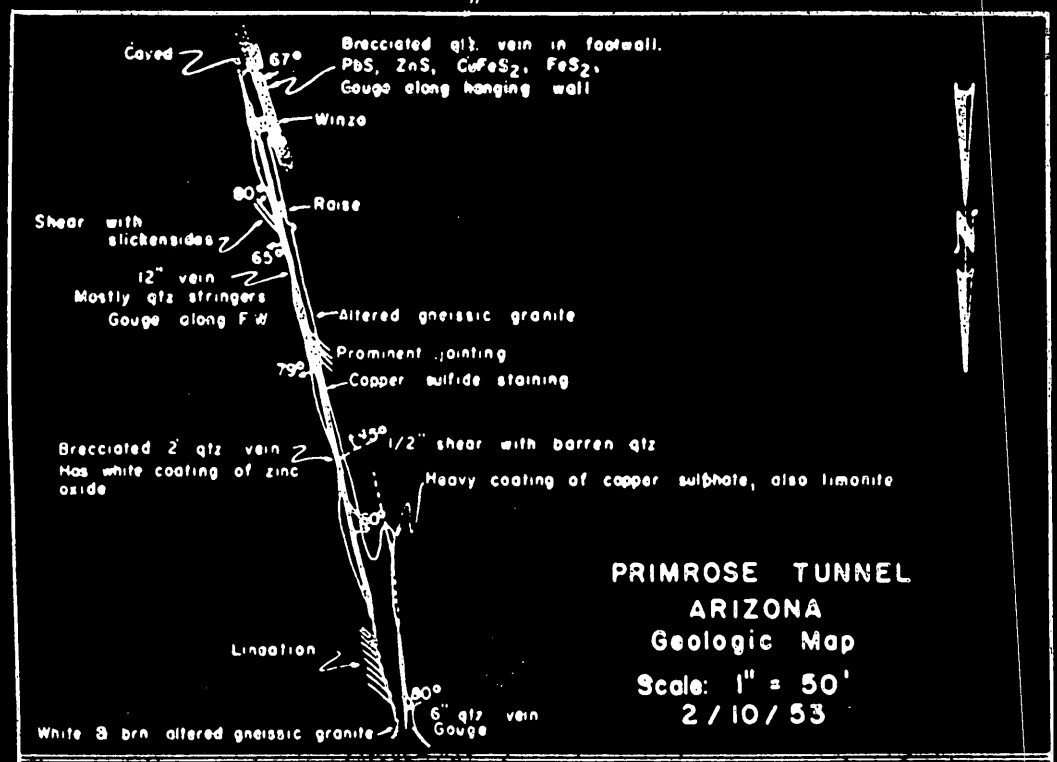
Your company's financial position

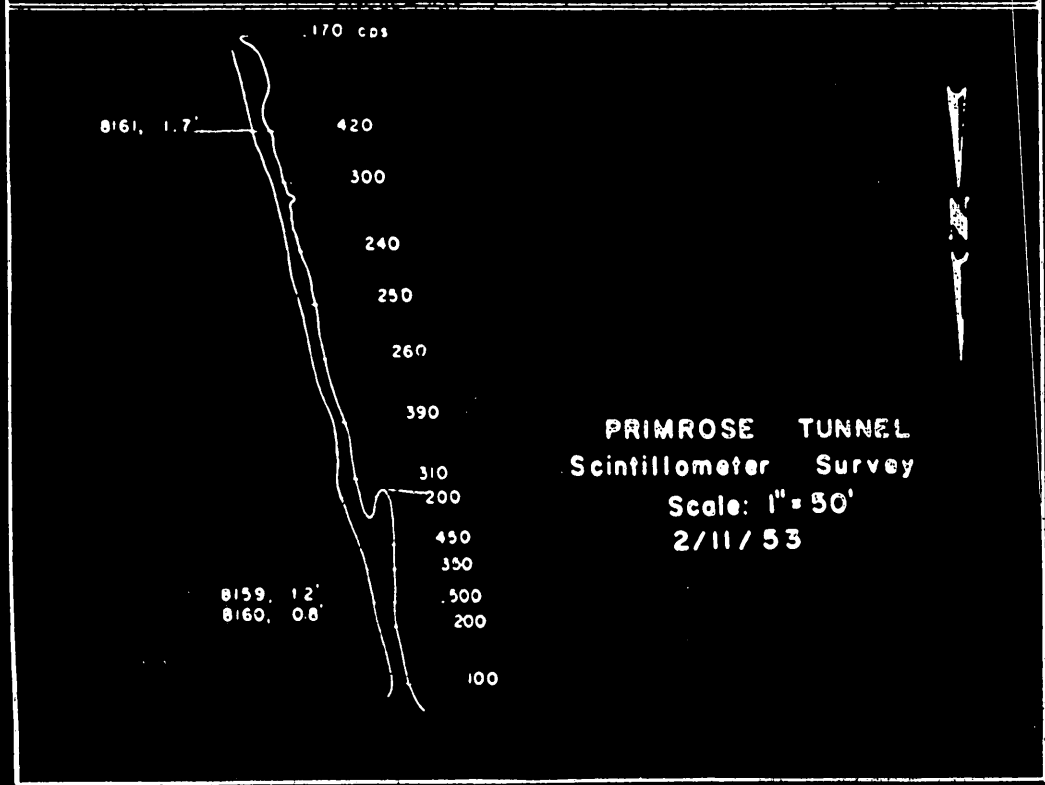
by JOHN C. FOSTER
Treasurer
ARIZONA-GOLCONDA METALS, INC.

TREASURER'S STATEMENT

The Company at the present time is in excellent financial condition with no important liabilities other than current operating costs, and complete financial report and details of results of the recent stock issue will be forthcoming in the near future.

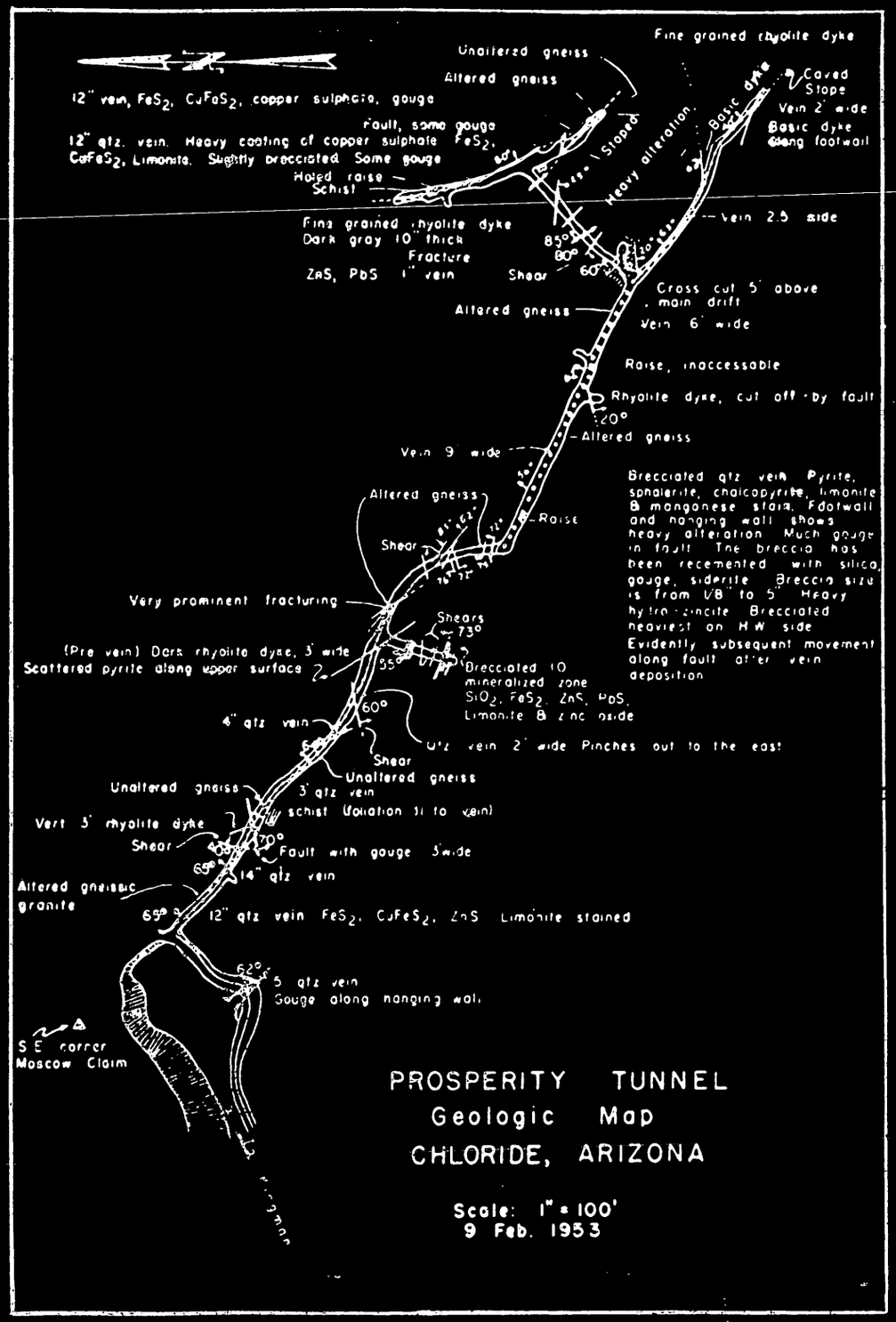
EXHIBIT # 12

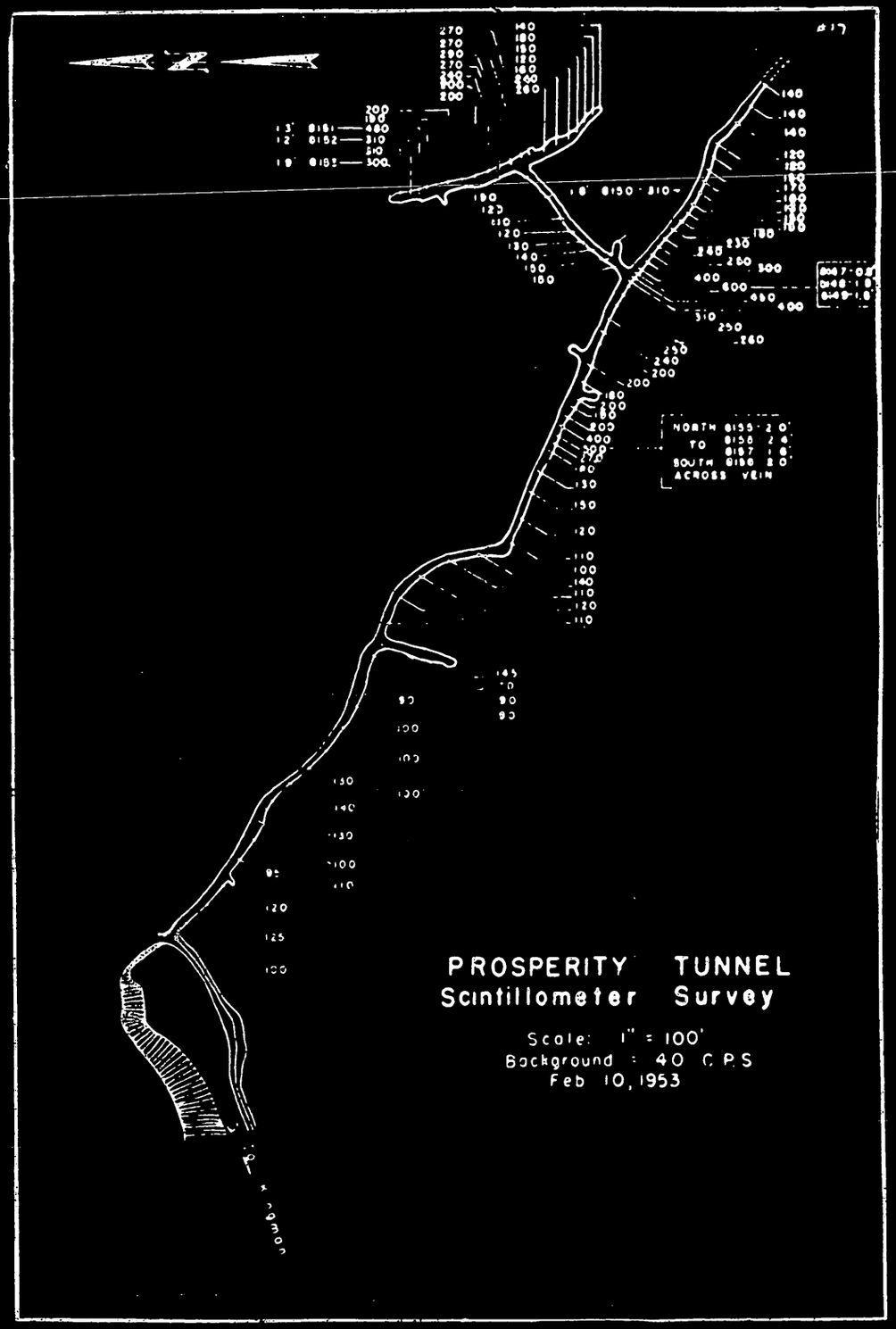




THIS IS AN A.E.C. MAP

EXHIBIT # 12





THIS IS AN A. E. C. MAP

EXHIBIT
11
NBCL
NCJ Re-1221

P. E. LANDOLT
CONSULTING ENGINEER
38 WEST 44TH STREET
NEW YORK

May 23, 1955

Mr. John C. Foster
c/o Arizona-Golconda Metals, Inc.
44 Wall Street
New York 5, New York

Dear Mr. Foster:

In accordance with arrangements made with you, I proceeded to Kingman, Arizona, via Phoenix. I found en route that Kingman is very much nearer to Las Vegas, and when going to the property in the future, it would seem better to go via Las Vegas.

I arrived in Kingman on the evening of May 5th and met Mr. John Sherman Bagg, who developed the situation and who is in charge on the site for your company.

We spent the entire day in the field on Friday, May 6th. We looked over the site of the main mining areas and old mill and examined material on the surface from the roadway to the top of the hill, where the old shaft and mill site are located.

I was impressed with the observation that the mineralized material was quite friable and seemed to break away readily with a light hammer from the bulk of the gang material. The mineralization at the old mill site and in numerous areas adjacent to this site seems to be largely zinc sulfide (sphalerite) and some showings of galena (lead sulfide), and chalcopyrite (copper iron sulphide) with some quartz material and some muscovite (mica).

There is considerable material above ground which would appear to be worth recovering. Without more careful surveys, it was not possible in the time allotted to make any reasonable accurate determination of the extent of this material above ground. This could be in toto from 10,000 tons - 50,000 tons.

In addition there is a considerable amount of tailings which may have value. In addition to the elements above mentioned, there would be an appreciable percentage of gold and silver, and there appears to be indications in some of the mineral specimens of pitchblende. From reports made some time ago, it would appear that there is an appreciable quantity of uranium minerals, principally pitchblende as mentioned above.

After carefully looking over the surface situation, we went underground into the Peach tunnel at the 1400 foot level. The Peach tunnel is an excellent tunnel, about 2,500 to 3,000 feet in length, of ample size and timbered in certain portions of the tunnel. Some of this timbering will have to be renovated but that would not appear to be too serious.

Apparently enough water could be reclaimed from the mine to create a pond on the property which would furnish a sufficient amount of water for concentrating operations. I observed other shafts around the one adjacent to the old mill and undoubtedly these can be renovated when necessary for use. I also examined a number of maps of the properties with Mr. Bagg to get a picture of the explored areas. Mr. Bagg feels confident that in one area underground which can be gotten to without too much expense, there is a very substantial amount of rich ore.

After looking over the principal site of the properties, we drove through the adjacent area to get a picture of other properties in the vicinity, two of which Mr. Bagg believes are worth acquiring which he can obtain quite advantageously. In the vicinity of the Golconda properties there are some works that have been activated by Kennicott.

We examined some old reports of analyses which apparently had been made under good auspices but were made a good many years ago. With regard to elements present such as germanium and indium particularly, I feel that an up-to-date sampling campaign will have to be undertaken with current analyses of such samples before trying to arrive at any conclusion as to the recovery of special metals.

It would appear from other information gained in the district that complex zinc ore in that area appears to have appreciable quantities of germanium and indium, and therefore, it would be likely to expect that the Golconda properties would be interesting in this respect also.

In the course of our discussions, I learned that Mr. Bagg has an excellent contractor familiar with and skilled in mining operations, who does contract work on a unit cost basis. This contractor has ample equipment and a good crew of skilled miners. This would be very advantageous as it might be difficult to organize a good crew and get it working effectively whereas this contractor could start immediately and do a job in which costs could be established in advance, and he would have the burden of social security, payroll taxes, etc. rather than load those on to your company or Mr. Bagg at the outset.

I recommended to Mr. Bagg that as soon as you authorize him to get underway, which I expect will be soon, that he do some cleaning up work in the tunnel in preparation for mining. I have asked him as a part of this initial campaign to make as good a sampling of the material above ground as he can, taking 50 to 100 pound sample from each of the main dumps on the property, assembling these and then shipping East a large sample perhaps 50 to 500 pounds, part of which will be used for verification of concentrating methods and part of which might be useful for tests such as contemplated with the Dorr Company at Westport, Connecticut.

Mr. Bagg and I spent considerable time in discussion about the property, in which he outlined to me the time and effort he put in to put these properties together for the company, giving me some review of the litigation which he went through and finally won and also gave me reports on his background and associations, some of which I was familiar with.

I was satisfied after a two-day visit with Mr. Bagg that he is an accredited mining man of good integrity and that he has every confidence that the property can be developed successfully. He pointed out that if the properties were activated and a concentrating mill available that other adjacent properties would likely be activated, which would be a further source of raw material for the plant. He recognized that the treatment of this complex is a special job, which we have all recognized, and the ores as mined or concentrated could not be advantageously sold as such to local smelters. He agrees also that so far as the base metals and precious metals present that mining recovery costs might be unprofitable or with a small margin, whereas he believes the ultimate recovery of special metals and uranium minerals would be the real goal of this operation, with which I believe everybody interested will concur.

While at Kingman, Mr. Bagg took me to a site that he believed would be best suited for the ultimate location of a chemical treating plant. It was his thought to locate the concentrating mill near the mining site and then truck the concentrate over good roads for a distance within twenty miles to the site that he has in mind close to Kingman. The site is on level ground on property owned by the Atchison Topeka & Santa Fe Railroad. Mr. Bagg stated that he had communicated with proper officials of the railroad and ascertained that he could advantageously lease such property. He would have a railroad siding there, an adequate source of water, electric power, and high-pressure gas lines are now available within something less than twelve miles of the site. It is his understanding that if there was a demand for it a branch of the pipeline would be extended to the vicinity of the proposed plant site.

The available land area is more than adequate for the type and size of plant that might be contemplated and would be in a good area for satisfactory labor. Until proper examination of the kind of material to be treated is available, it is premature to state just what such a plant would consist of. It might involve an operation such as would be offered by the Dorr Company, a fluo-solids system, leaching, filtration, etc, and major segregation of the principal metal constituents to produce concentrates that could be handled as commercial raw materials for the specific metallic elements under consideration. Such a plant when and as determined will involve a substantial investment, but if the various factors that are involved are substantiated, then such an investment would be warranted in carrying through the project to its ultimate conclusion.

This does not necessarily involve the production of all of these materials in refined metallic state, as they require special techniques and extensive equipment which may very well be beyond the scope of this project, certainly for the present.

It is more than likely that the first steps to mine and concentrate and create a stockpile of concentrated material is the type of thing to concentrate on inasmuch as such concentrates can then be evaluated and perhaps useful as some form of collateral for the projects that would consequently follow.

I therefore wish to report to you that subject to certain steps being taken that this property appears to be worth developing, and I would recommend the following procedures at this time:

1. As I told you before I went out there, I am not a mining man, and I believe that in your interest and that of the company that a competent mining engineer should go out to Kingman to look over the properties, discuss the situation with Mr. Bagg and report back on his findings. I do not contemplate an overall complete examination as that would be time consuming, and at this time needlessly expensive. The purpose of bringing the mining man in is to have him make a general survey to report back that he believes that the mineral content on the property is well worth mining and recovering.

I have made some investigation at your request and have asked Mr. Frank Ayer, an excellent mining consultant to undertake this job, and subject to his review of reports and other information that you have here, he would be prepared to go out to Kingman between the 2nd and 6th of June, I believe that two or at most three days would suffice for the type of examination desired at this time. Incidentally I mentioned Mr. Ayer's name to Mr. Boricke at Hayden-Stone and found that he knew him very well and felt that if he would report on the job that would be very satisfactory to him.

In case Mr. Ayer can't take care of this requirement, I have one or two other good mining men to suggest.

2. I feel that it would be of the greatest importance if at your earliest convenience you could take a run out to Kingman to see Mr. Bagg and look over the situation yourself. I am sure that you would be well impressed with the situation there. I understand that you can not arrange to go at this time although I feel that if you can accompany the mining engineer, it would be of greatest value to you.

3. As soon as the sampling work referred to has been carried out, I would make some check ups possibly through Ore & Chemical Corp. to determine the requirements for concentrating this material, which I am sure can be effectively done by the Heavy Media system, and from such concentrates we can obtain samples for up-to-date and accurate analyses, particularly with respect to special metals referred to.

Once such material is available, we will have the problem of how to best treat the concentrate to obtain the principal values or at least to put them in a condition or concentration which would make them saleable to the proper parties for the recovery of the specific metal constituents.

Very truly yours,

P. E. Landolt/dh

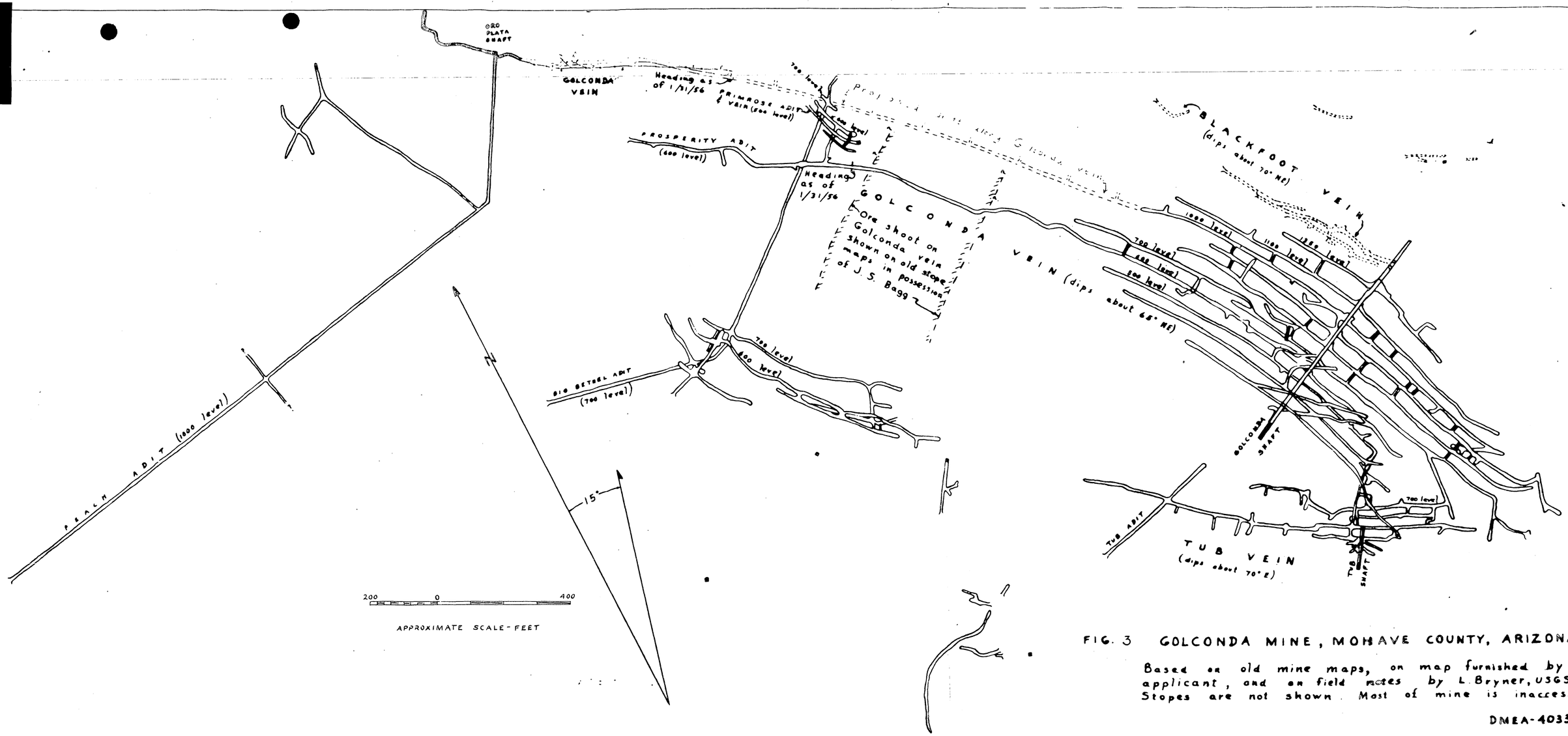


FIG. 3 GOLCONDA MINE, MOHAVE COUNTY, ARIZONA

Based on old mine maps, on map furnished by applicant, and on field notes by L. Bryner, USGS. Stopes are not shown. Most of mine is inaccessible

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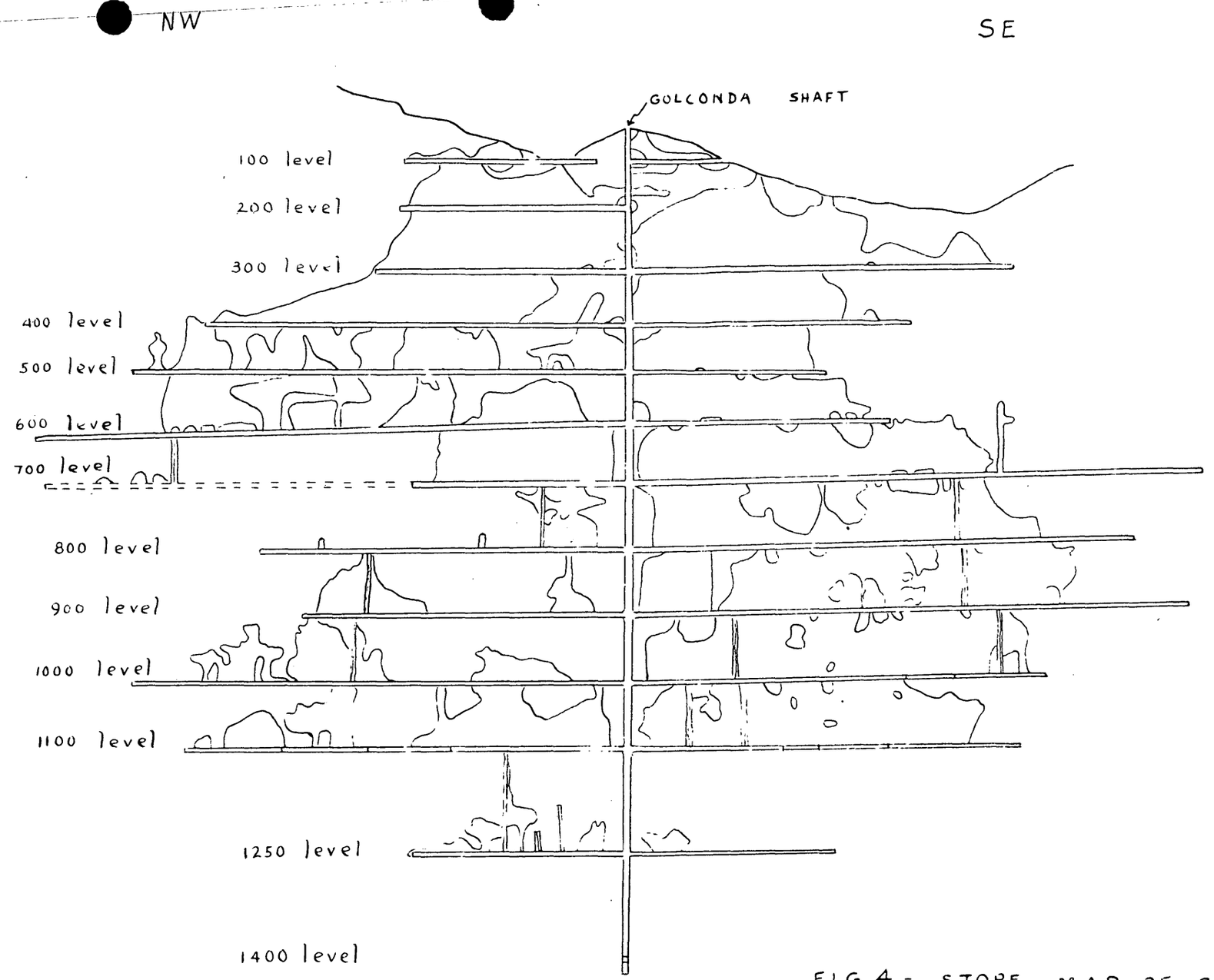
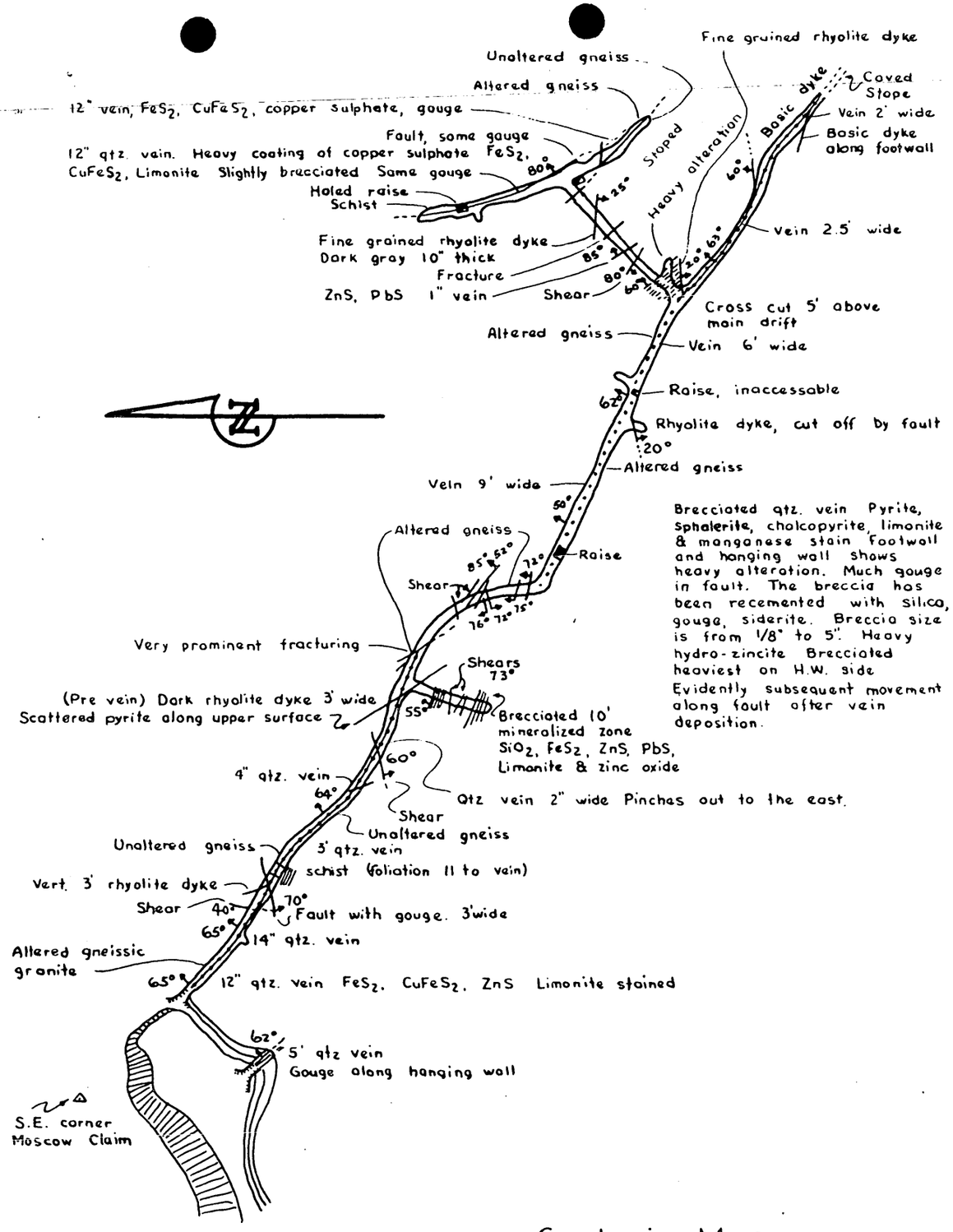


FIG. 4 - STOPE MAP OF GOLCONDA MINE, MOHAVE COUNTY, ARIZ.

From photostat of map of Union Basin Mining Company, dated Jan. 1, 1918

0 200 400

APPROXIMATE SCALE - FEET



Brecciated qtz. vein Pyrite, sphalerite, chalcopyrite, limonite & manganese stain Footwall and hanging wall shows heavy alteration. Much gouge in fault. The breccia has been recemented with silica, gouge, siderite. Breccia size is from 1/8" to 5". Heavy hydro-zincite Brecciated heaviest on H.W. side Evidently subsequent movement along fault after vein deposition.

-Geologic Map-

	% cU_3O_8	% eU_3O_8
8147	0.138	0.094
8148	0.029	0.024
8149	0.011	0.012
8151	0.010	0.006
8152	0.019	0.036
8153	0.018	0.017
8155	0.041	0.037
8156	0.058	0.035
8157	0.033	0.025
8158	0.005	0.002

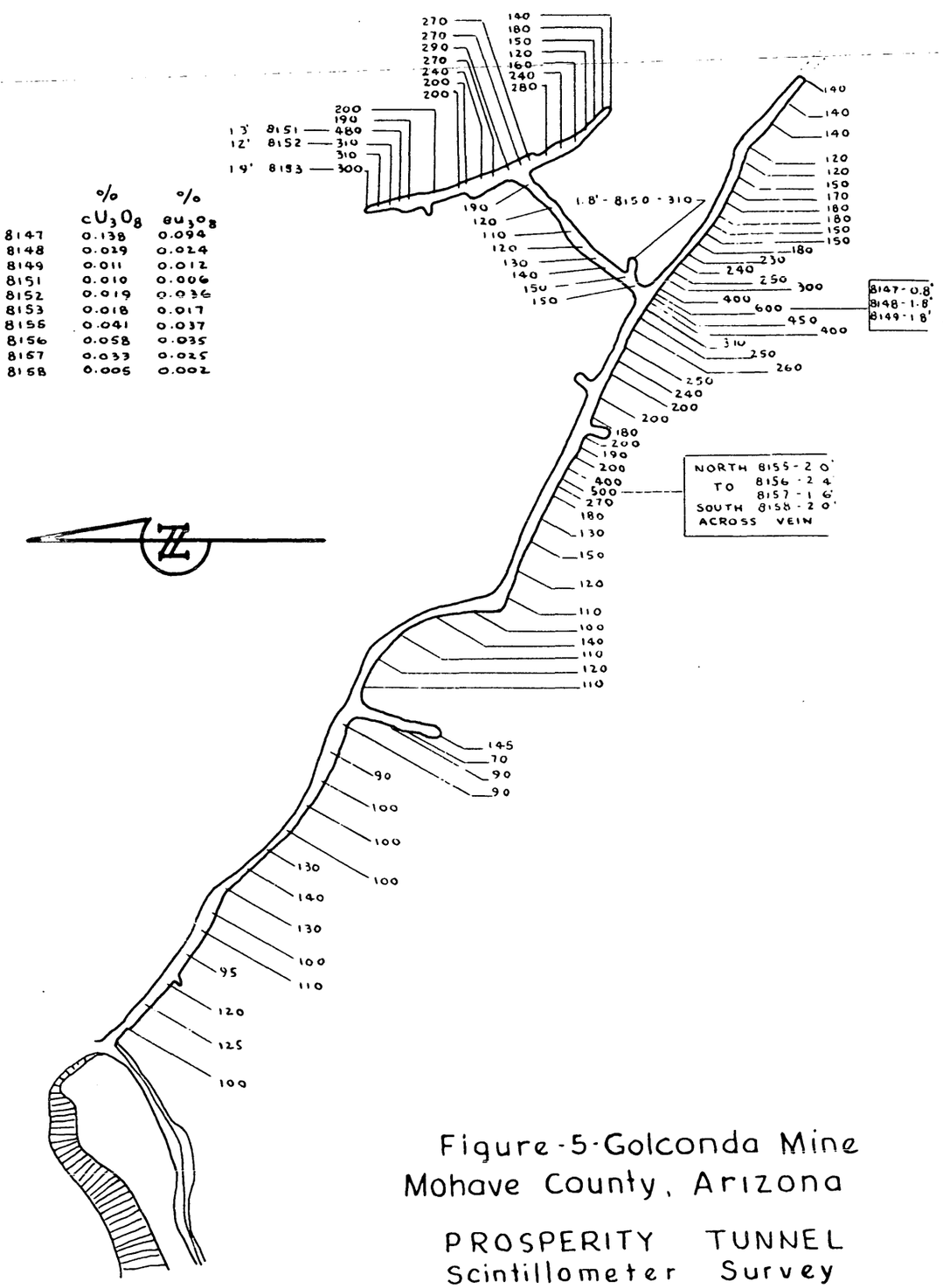


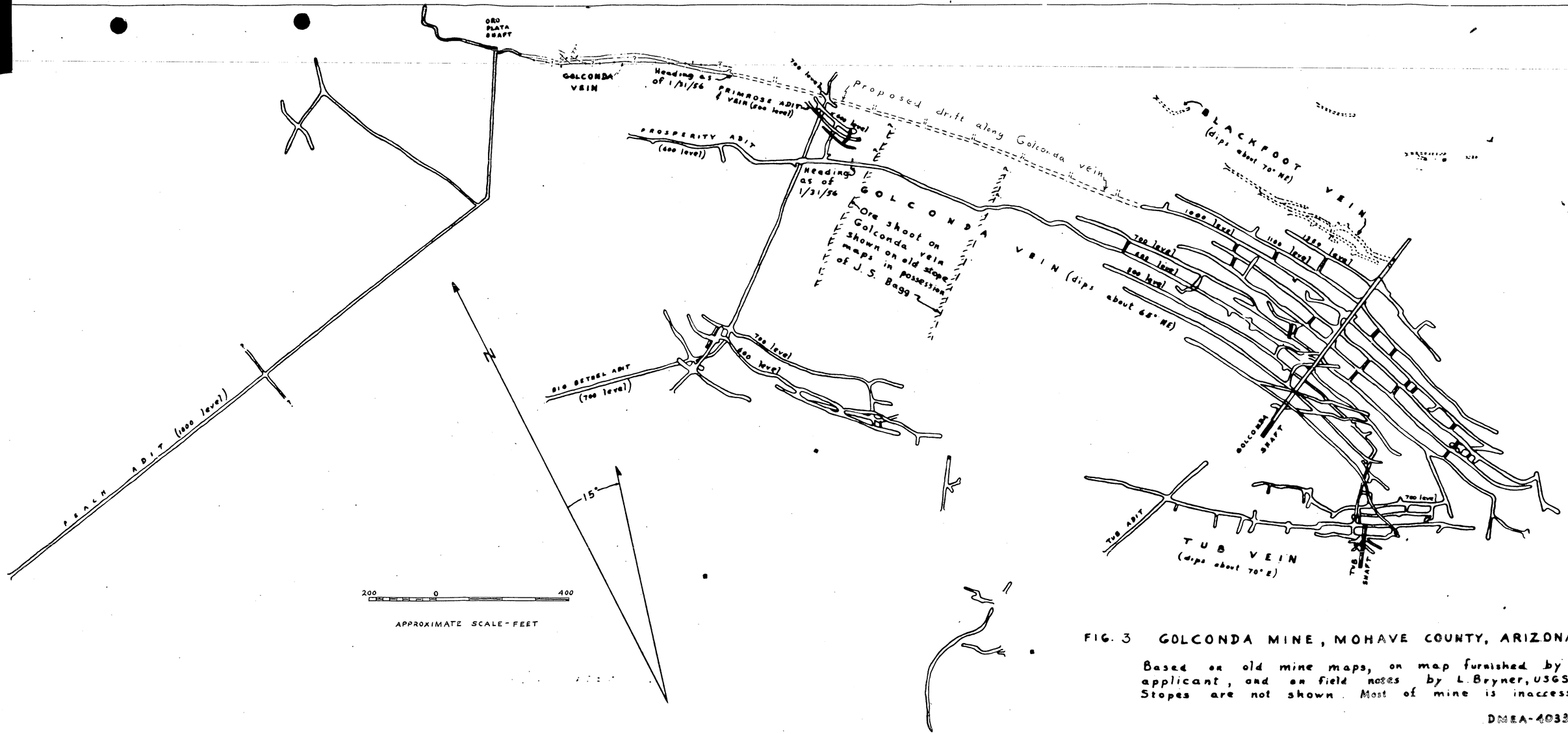
Figure-5-Golconda Mine
Mohave County, Arizona

PROSPERITY TUNNEL
Scintillometer Survey

Scale: 1" = 100'
Background = 40 C.P.S.
Feb 10, 1953

Copied from AEC RME-4026

DMEA 4033



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Based on old mine maps, on map furnished by applicant, and on field notes by L. Bryner, USGS. Stopes are not shown. Most of mine is inaccessible

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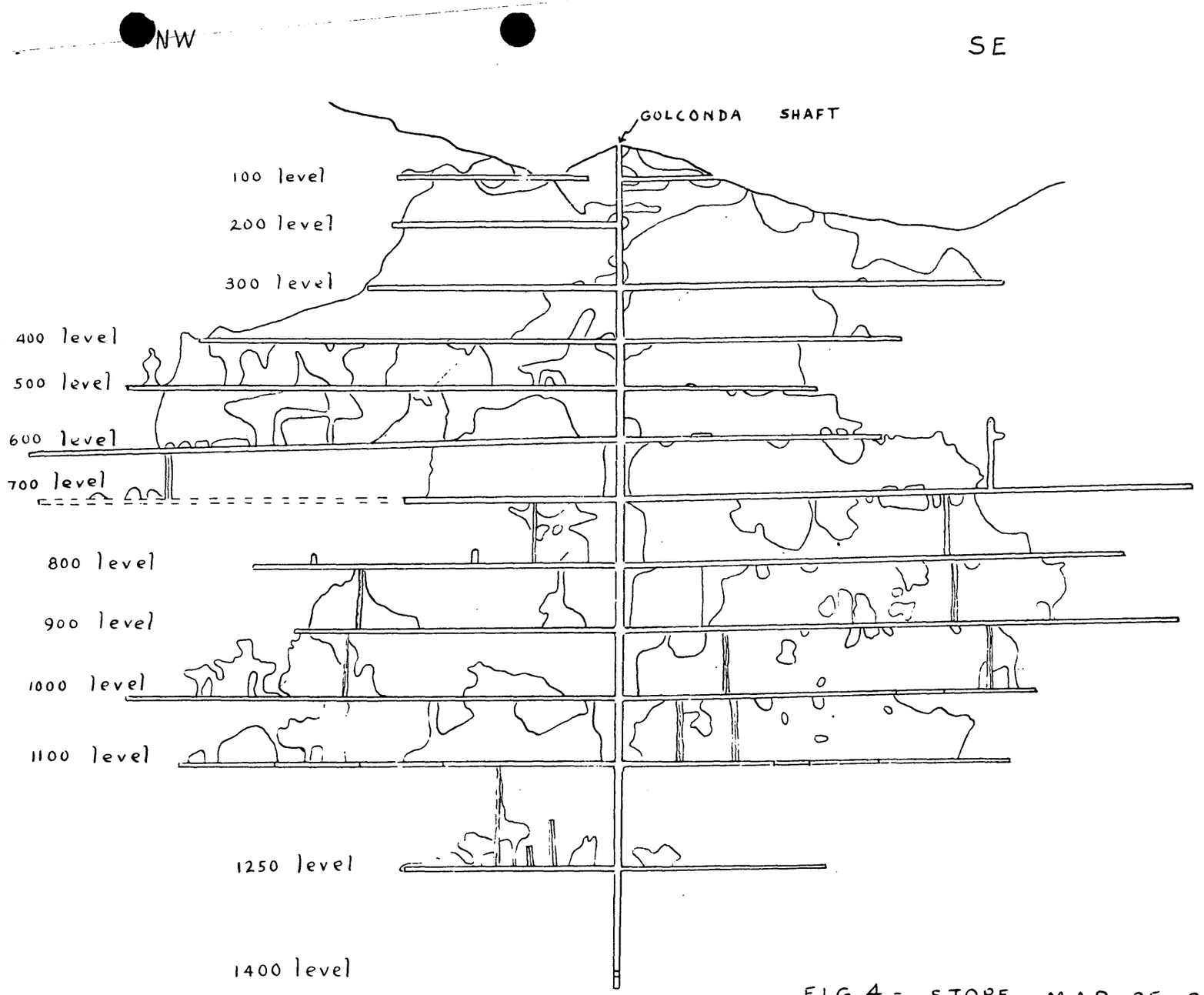

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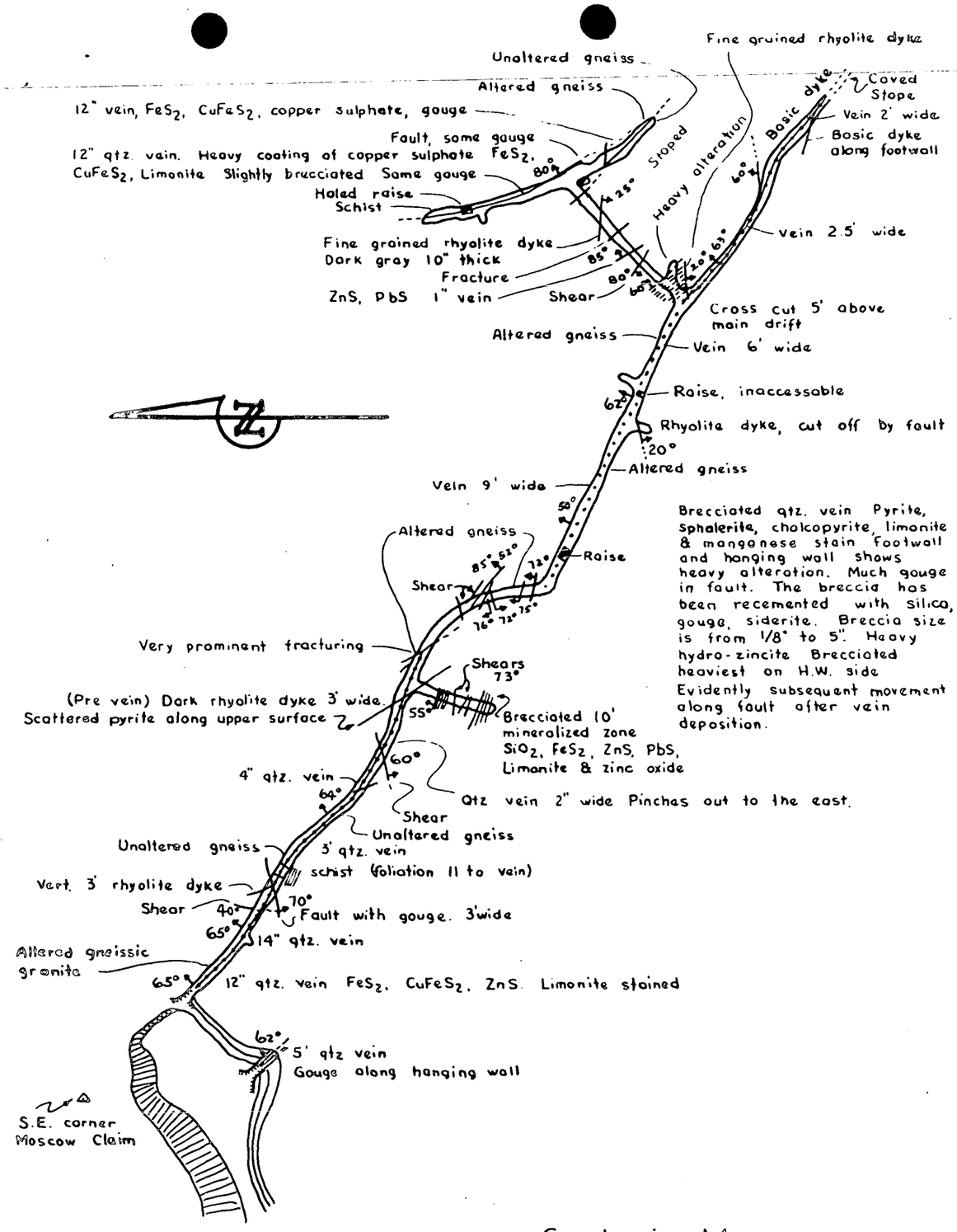
From photostat of map of Union Basin Mining Company, dated Jan. 1, 1918

0 200 400

APPROXIMATE SCALE - FEET



-Geologic Map-

	% cU_3O_8	% eU_3O_8
8147	0.138	0.094
8148	0.029	0.024
8149	0.011	0.012
8151	0.010	0.006
8152	0.019	0.036
8153	0.018	0.017
8155	0.041	0.037
8156	0.058	0.035
8157	0.033	0.025
8158	0.005	0.002

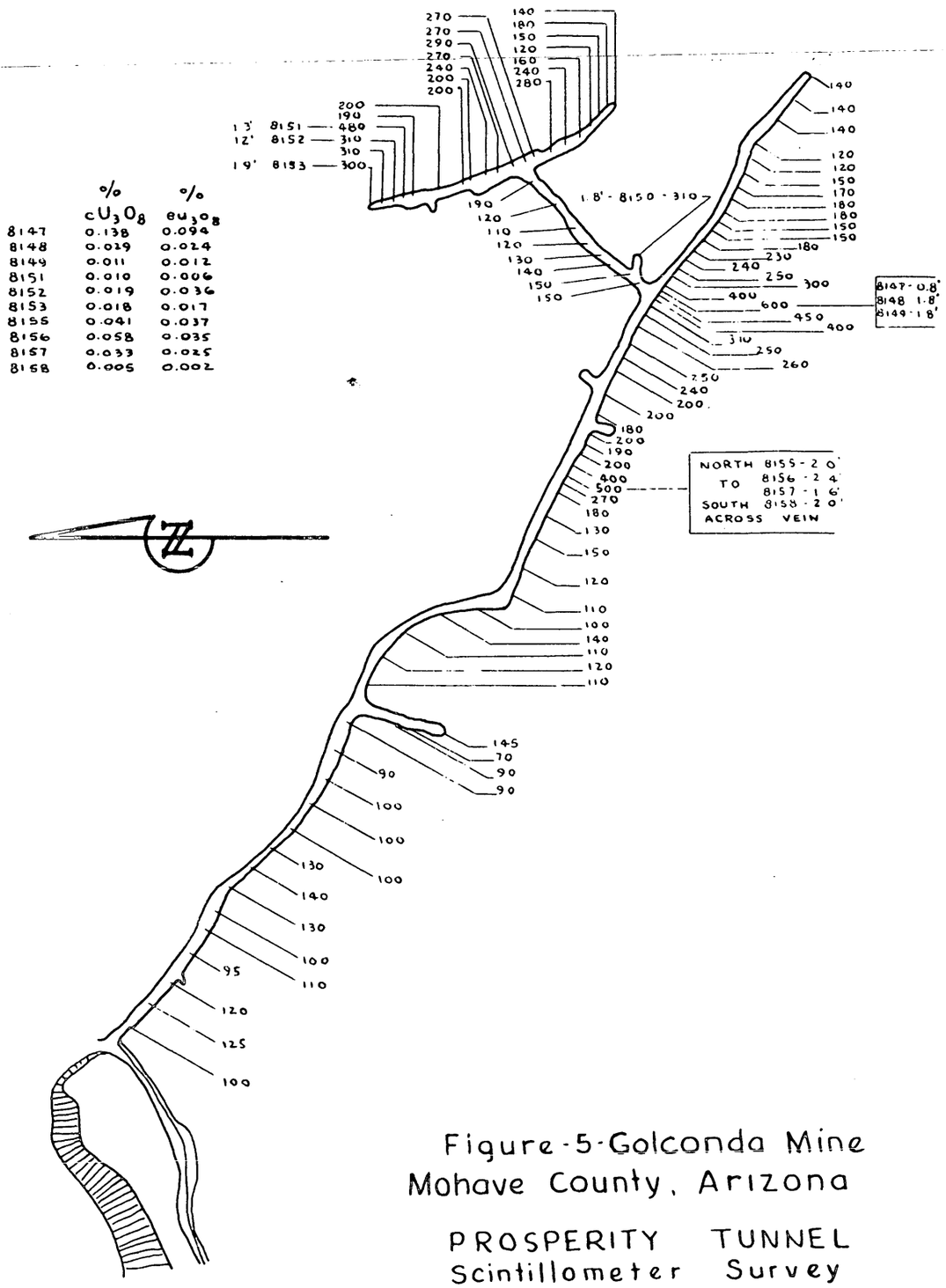


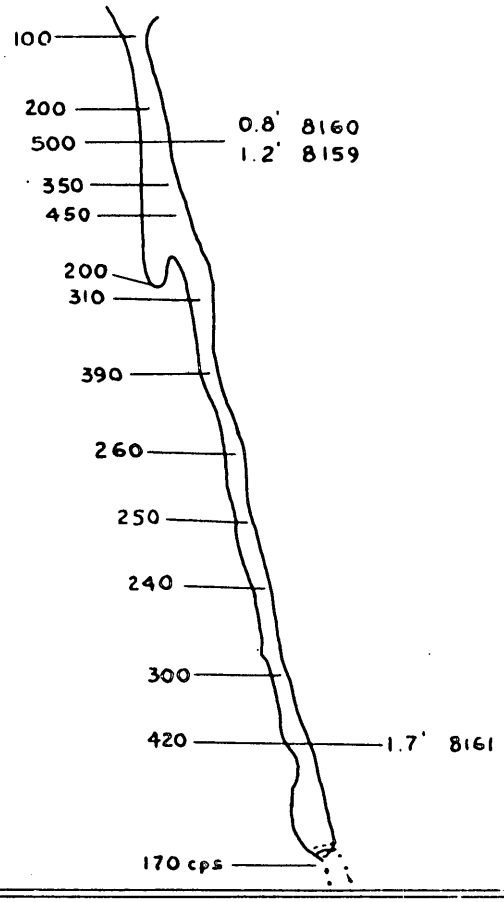
Figure-5-Golconda Mine
Mohave County, Arizona

PROSPERITY TUNNEL
Scintillometer Survey

Scale: 1" = 100'
Background = 40 C.P.S.
Feb 10, 1953

Copied from AEC RME-4026

	% CU_3O_8	% eU_3O_8
8159	0.035	0.038
8160	0.025	0.027
8161	0.128	0.075



Scintillometer Survey
Scale 1" = 50'
2 / 10 / 53

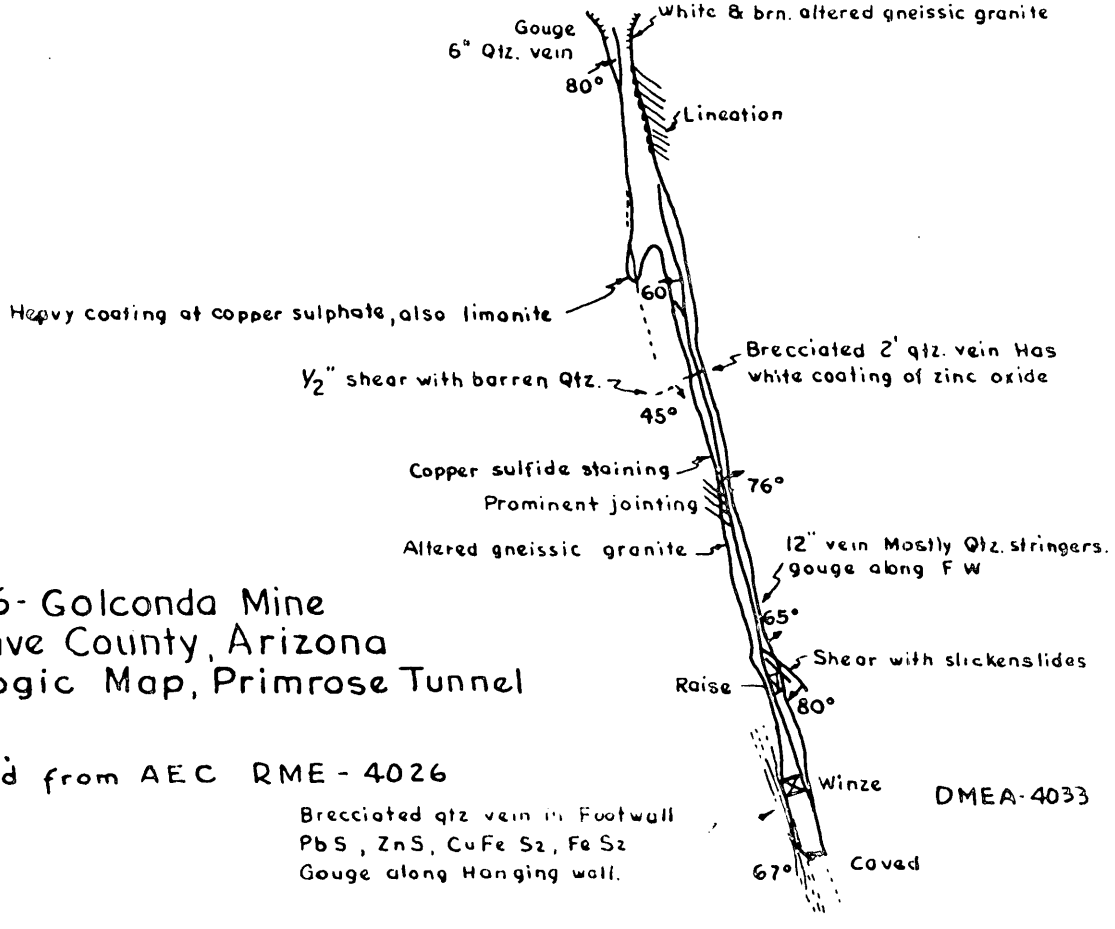


Fig-6- Golconda Mine
Mohave County, Arizona
Geologic Map, Primrose Tunnel

Copied from AEC RME-4026

DMEA-4033

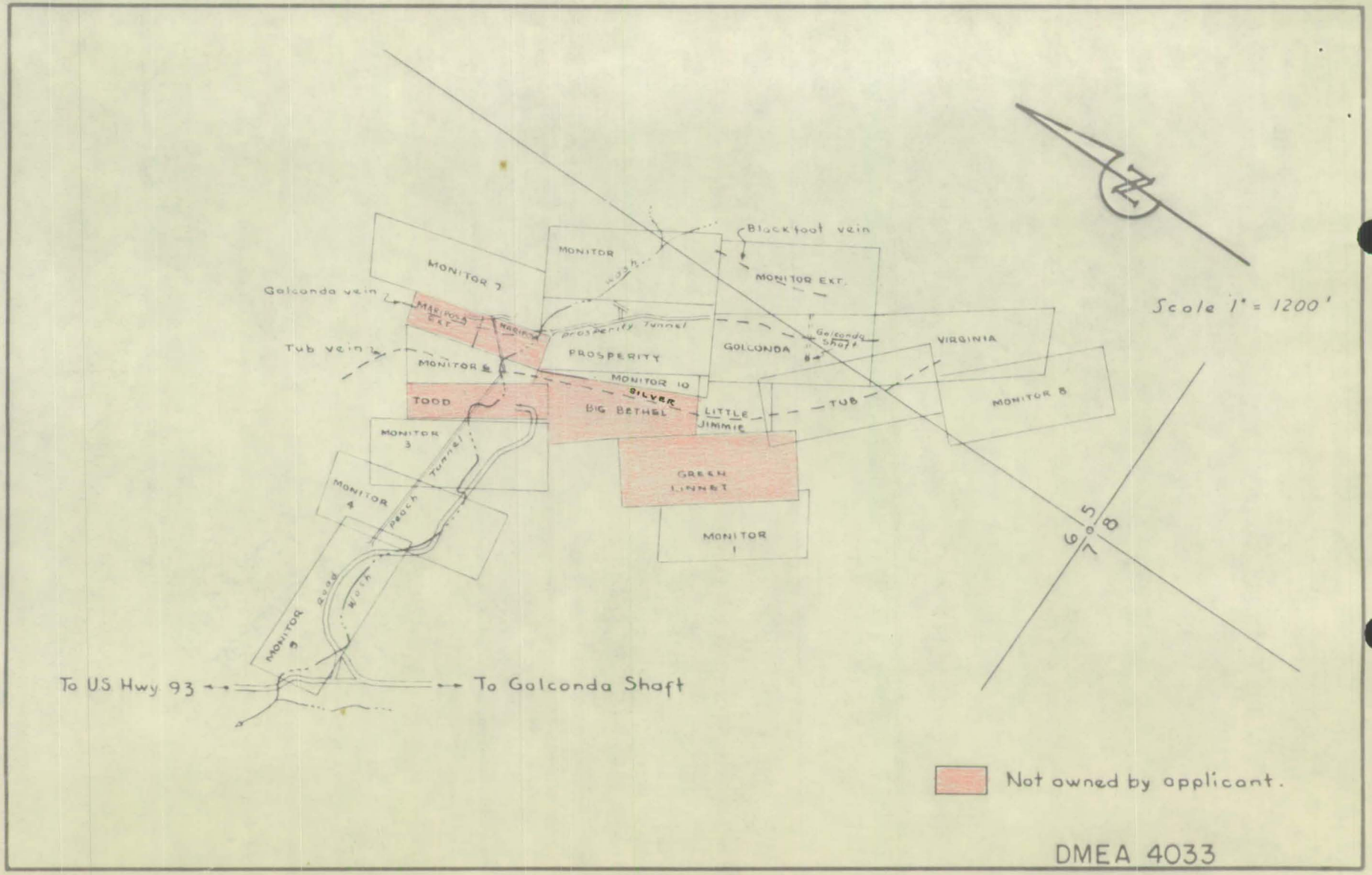


FIG-2- CLAIM MAP, GOLCONDA MINE
THE ARIZONA GOLCONDA METALS INC.
MOHAVE COUNTY, ARIZONA

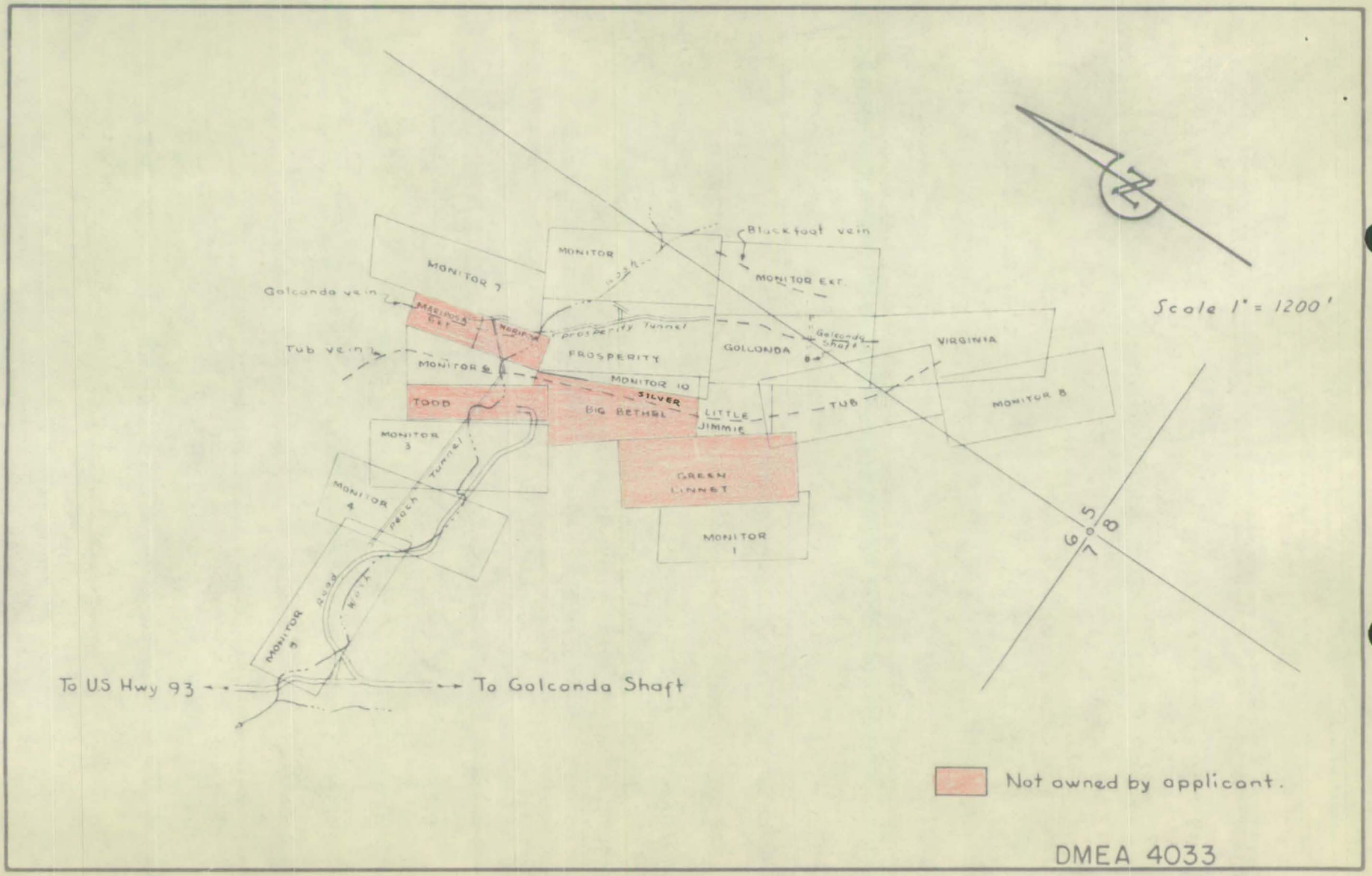


FIG - 2 - CLAIM MAP, GOLCONDA MINE
THE ARIZONA GOLCONDA METALS INC.
MOHAVE COUNTY, ARIZONA