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

224 New Customhouse
Denver, Colorado

Air Mail

September 7, 1951

Memorandum

To: Executive Secretary, Defense Minerals Administration

From: DMA Field Team, Region IV

Subject: Final Report, Docket DMA-1019, Jas. R. Mattingley, Applicant, Tiptop and Copper Duke Copper Mines, Pima County, Arizona

Enclosed herewith is original and two copies of the report as indicated above.

We concur with the conclusions and recommendations of the examining team.

J. H. East, Jr.

A. H. Koschmann

Enclosures

Mining Division
Region IV

September 4, 1952

Memorandum

To: DMA Field Team, Region IV

From: Chief, Mining Division, Region IV

Subject: Final Report, Docket MMA-1013, Jas. E. Hutchinson, Applicant, Tiptop and Copper Hole Copper Mines, Pima County, Arizona

The application of the subject docket was for a guaranteed loan of $20,000 for the purpose of equipping the Copper Hole mine for production at an estimated cost of $12,000, and for the exploration by diamond core drilling of the two deposits at an estimated cost of $12,000.

The mineralization consists of lenses of copper ore in limestone and quartzite near the contact with underlying granite, with some ore in the granite. The Tiptop mine has no measured nor indicated reserves. At the Copper Hole mine, pock quartzite has removed all the ore associated with limestone above the mine workings. The measured and indicated reserves of the surface deposits at the Copper Hole mine consist of a few hundred tons of 3.0 to 3.5 percent copper.

Due to the small tonnage of low grade reserves and the geologic improbability of developing additional reserves, the mining engineer recommends denial of both the development and exploration loans, with which we concur.

Paul T. Allmon

Paul T. Allmon

Mining Division
Date Rec'd.

SEP 4 1951

BUREAU OF MINES
Denver, Colorado

MINING DIVISION
REGION IV

August 29, 1951

Memorandum

To : Paul T. Allsman, Denver, Colorado

From : Chief, Arizona-New Mexico Br., Mining Div., Region IV

Subject : Final Report, Docket DMA-1019, Jas. A. Mattingley's Liptop Group of Copper Mines, Pima County, Ariz.

Enclosed are original and 7 copies of the above report by T. M. Gonzalo of the Bureau of Mines. No separate geological report will be submitted by the Geological Survey.

This report has my approval.

Brochure is enclosed.

Walter A. Storms

cc P. T. Allsman (7)
J. A. Anderson
DMA 1019
DF

WAStormsjals

UNITED STATES
DEPARTMENT OF THE INTERIOR
OSCAR L. CHAPMAN, SECRETARY

DEFENSE MINERALS ADMINISTRATION

REPORT OF EXAMINATION BY FIELD TEAM
REGION IV

DMA-1019. - Jas. M. Hartingly's Tiptop Group of Copper Mines

Pima County, Ariz.

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

August 1951

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

By T. R. Remale[1]

The Tiptop group of copper mines, consisting of the Tiptop and Copper Duke mines, was examined in connection with an application to the Defense Minerals Administration for a Governmental loan of $22,870 by James R. Buttingly, 139 Custer, Evanston, Ill. The applicant proposed to equip the Copper Duke mine for production at an estimated cost of $12,870, and to explore this mine and the adjacent Tiptop mine by diamond drilling at an estimated cost of $10,000.

The Tiptop and Copper Duke mines were discovered in 1895. Production has been confined to the period, 1904 to 1906, when approximately 17,300 tons of 6.5 percent copper ore was mined from the Tiptop and 400 tons of 35 percent copper ore was produced from the Copper Duke mine. Since 1906, activity at the mines has been confined to assessment work, the uncovering of a mineralized zone at the Copper Duke in 1947 by the applicant, and the production of 105 tons of 2.8 percent copper ore by the mine owner in 1951.

On the property, pre-Cambrian granite is overlain successively by Cambrian (?) quartzite and Paleozic limestones. The sedimentary rocks occur as small pendants which are in normal and also in fault contact with the underlying widely exposed granite.

1/ Mining Engineer, Arizona-New Mexico Br., Mining Div., Region IV Bureau of Mines.

At the Tiptop mine the sedimentary rocks dip steeply. They are in contact with the granite at a shallow depth below the surface. The ore, both as oxides and sulfides of copper, occurs in altered and fractured limestone, as pockets and bunches. It is confined to a narrow zone along the limestone-quartzite contact.

At the Copper Duke mine the ore in the underground workings is associated with a thin bed of limestone. On the surface it occurs in granite and rhyolite. The underground deposits occur as small lenses at the fault contact with overlying granite and rhyolite. The ore minerals are azurite, malachite and a little chrysocolla. At the surface the same minerals are deposited in the fractured igneous rocks as blebs and discontinuous veinlets.

The applicant proposed to explore the deposits by diamond drilling 3 holes at the Copper Duke mine and 7 at the Tiptop mine at an estimated cost of $10,000. He also proposed to equip the Copper Duke mine for open-pit mining at an estimated cost of $12,870. He proposed to repay the loans from profits derived from the mining operations.

The Tiptop mine contains no measured nor indicated ore reserves. Furthermore, the following findings indicated that the possibilities of finding substantial ore reserves are unfavorable:

1. The ore, both oxides and sulfides of copper, occurred as pockets and bunches in limestone that were confined to a narrow zone near its contact with quartzite;
2. The ore occurred mainly above the lower adit and all of it is believed to have been removed by past mining operations;

3. Little or no ore was found by the lower workings that have rather thoroughly explored the favorable zone;

4. Field evidence indicates the zone favorable to ore deposition is not extensive and that all but a small portion of the zone has been explored by mine workings.

The copper deposits associated with limestone at the Copper Duke mine contain no measured nor indicated ore reserves. These deposits, as leases of oxide ore, yielded a total of 400 tons from the zone above the adit level. It is possible that other deposits may occur at lower horizons of the limestone bed but there are no criteria for determining their probable locations. Furthermore, there is no reason to believe that such deposits would be of sufficient extent to be minable under present conditions.

The measured and indicated reserves of the surface-exposed deposit at the Copper Duke mine amount to a few hundred tons of 3.0 to 3.8 percent copper ore. The deposit is cutoff at a depth of a few feet but may extend several tens of feet into the hillside. however, field evidence indicates the inferred reserves, which may be several times the measured and indicated reserves, consist of lower grade material.

It also is concluded that ore of the grade exposed at the surface cannot be mined at a profit. Open-pit mining of the deposits might yield ore containing as high as 3 percent copper, as estimated by the applicant. Ore of this grade would have a smelter value of of $10.75 a ton. Estimated costs a ton would be: $2.00 for mining,

$2.00 for trucking, $2.31 for freight, and $4.50 smelting charges, or a total of $10.81. This indicates a loss of $0.06 a ton before royalty and taxes.

It is recommended that the applicant's request for an exploratory loan be denied because the chances of developing any ore at either the Tiptop or Copper Duke mine is unfavorable.

It also is recommended that the request for an exploitation loan be denied because the proposed operation cannot be conducted at a profit.

JAS. R. MATTINGLY'S
TIPTOP GROUP OF COPPER MINES
PIMA COUNTY, ARIZ.
DMA DOCKET - 1619

Engineering Report

By T. M. Nemalo
Mining Engineer
U. S. Bureau of Mines

August 1951

JAS. R. HATTINGLEY'S
TIPTOP GROUP OF COPPER MINES
PIMA COUNTY, ARIZ.
DMA-1019

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INTRODUCTION

This report contains information obtained during the course of an examination of the Tiptop group of copper mines, Helvetia mining district, Pima County, Ariz. It also presents an evaluation of the property as it pertains to the Defense Minerals Administration.

The examination was made in connection with an application for a Governmental loan of $22,870 by James R. Mattingly, 139 Custer, Evanston, Ill. The applicant proposed to equip the Copper Duke mine for production at an estimated cost of $12,870, and to explore this mine and the nearby Tiptop mine by diamond drilling at an estimated cost of $10,000.

The examination was made August 6 and 7, 1951 by T. H. Kemble, Bureau of Mines. It is docketed as BrA-1019.

LOCATION, TOPOGRAPHY AND CLIMATE

The Tiptop group of mines is about 28 air-miles southeast of Tucson, Ariz. (fig. 1). The property is accessible from Tucson by traveling south on U. S. highway 89 for 28 miles to the village of Sahuarita, and thence 13.4 miles southeasterly on the graded, dirt road that leads to the Helvetia mining camp. From the point that is signed, "Tip-top mine", the property is about 2.5 miles over a winding, unimproved road.

Sahuarita, on the Nogales branch of the Southern Pacific Railroad, is the nearest railroad shipping point.

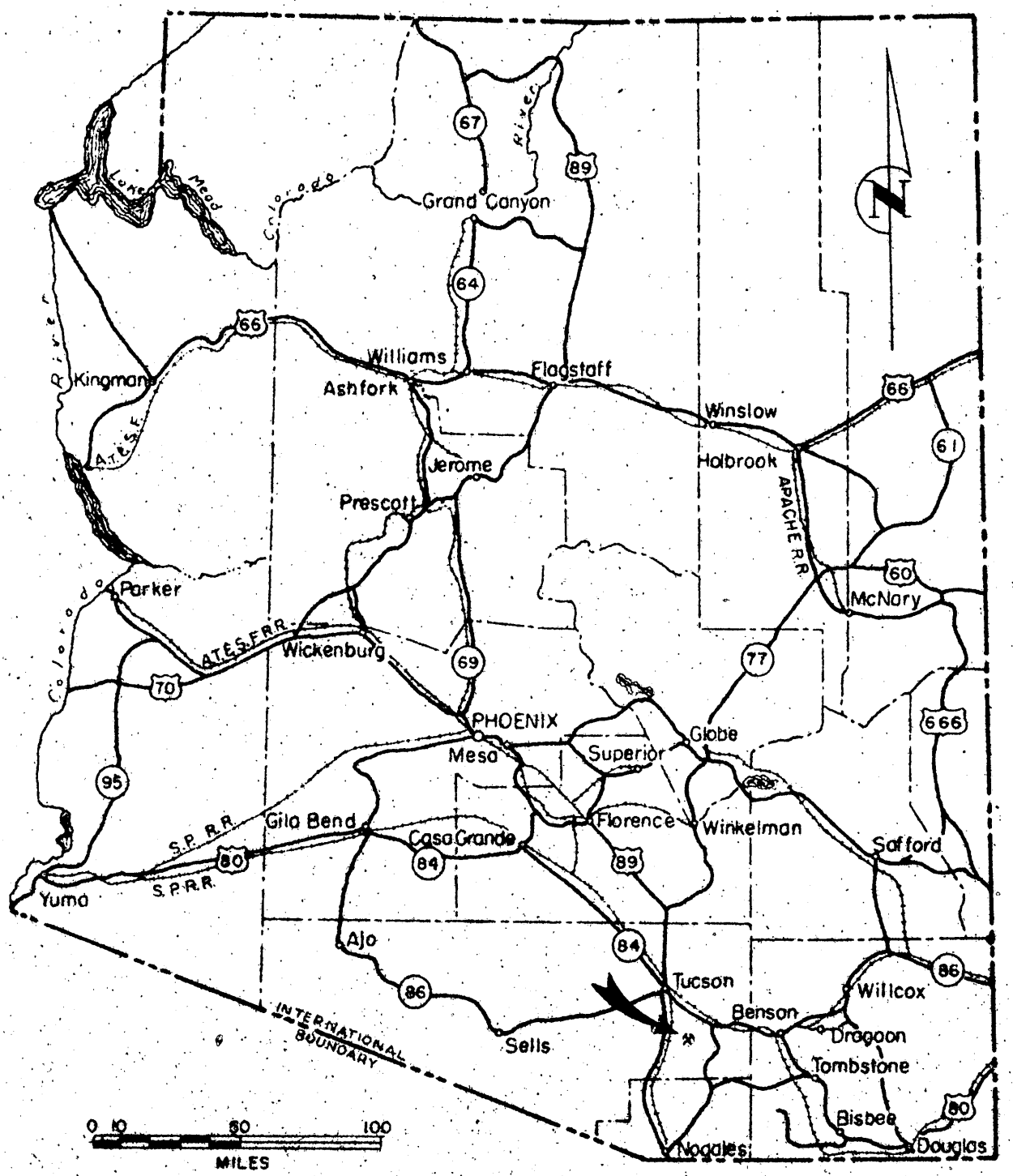


FIG. 1 – LOCATION MAP OF
TIPTOP GROUP OF COPPER MINES
PIMA COUNTY, ARIZONA

DMA 1019 AUG. 1951

The property is on the western slope and near the northern extremity of the Santa Rita Mountains. It is at an altitude of about 4,300 feet, on the northwest slope of Tiptop Mountain. The mountain is connected to the mountain range by a cross ridge. The area of the property is moderately rugged and has a range in relief of about 200 feet. About 2 miles east of the property the mountains have a crest-line altitude of about 6,000 feet.

The climate is arid, with hot summers and mild winters.

There are no permanent streams in the district.

Vegetation is confined to native grasses, scattered bushes and cacti, mainly ocotilla. Pines, juniper, and other conifers appear at higher altitudes.

HISTORY AND PRODUCTION

The Tiptop and Copper Duke mines were discovered and located in 1898. Little work was done at the mines until 1903 when they were acquired by the Tiptop Copper Co. The company developed both of the mines and shipped 1,000 tons of ore monthly from the Tiptop during the periods from March 1904 to June 1905, and from September 1906 to December 1906. The ore is said to have averaged about 6.5 percent copper and 0.5 ounce of silver a ton. During 1904 the company shipped about 400 tons of 35 percent copper ore from the Copper Duke mine. In December 1906, the Tiptop mine was bonded to the American Smelting & Refining Co. for $75,000. This company mined and shipped about 300 tons of ore before relinquishing the property in November 1907 to the Tiptop Copper Co.[1]

1/ Schrader, Frank C., Mineral Deposits of the Santa Rita and Patagonia Mountains, Arizona. U.S. Geol. Surv. Bull. 582, pp. 120 to 124.

The property, which also contained the patented claims of the Bulldozer mine, was held by the Tiptop Copper Co. until 1917 when R. J. Schamorad gained possession. Shortly after Schamorad's death in 1929, the unpatented claims were relocated by Mr. and Mrs. Albert Forbes, Tucson, Ariz. In 1947, James R. Mattingly obtained control of the property under a lease and option agreement. He applied to the Reconstruction Finance Corporation in June 1947 for a mining loan. He reported that the application was withdrawn after the Corporation had examined the property because funds were not available. Shortly after the death of Albert Forbes in 1949 the property was deeded by Mrs. Forbes to her son, Denver S. Forbes.

There was no production from 1907 until 1951 when the present owner shipped 103 tons of ore containing about 3.0 percent copper and 1.5 ounces silver a ton.

PROPERTY AND OWNERSHIP

The property consists of a group of 14 unpatented mining claims in secs. 14 and 15, T. 18 S. R. 13 E., Helvetia Mining District, Pima County, Ariz. It is owned by Denver S. Forbes, 417 N. Main St., Tucson, Ariz.

The applicant holds the property on a lease and option agreement for a period of 10 years from 1947. The agreement calls for the payment of 10 percent royalty on net smelter returns on ores produced from the property.

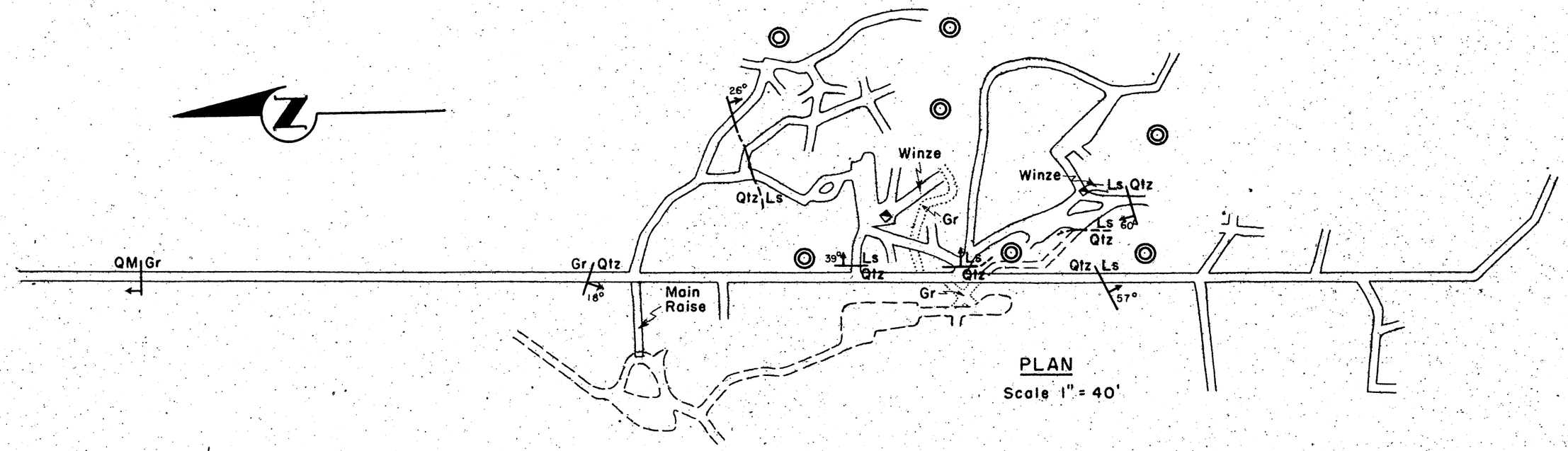
GENERAL GEOLOGY

A coarse granite, probably of pre-Cambrian age, is the basement rock of the district. It is overlain by Cambrian (?) quartzite and Paleozoic limestones. Both the granite and the sedimentary rocks have been intruded by a stock of alaskite granite porphyry and by dikes, principally of the alaskite-aplite types. The granite occurs in both normal and fault contact with the overlying rocks.

In the vicinity of the Tiptop property most of the sedimentary rocks have been removed and the pre-Cambrian granite is exposed over much of the area.

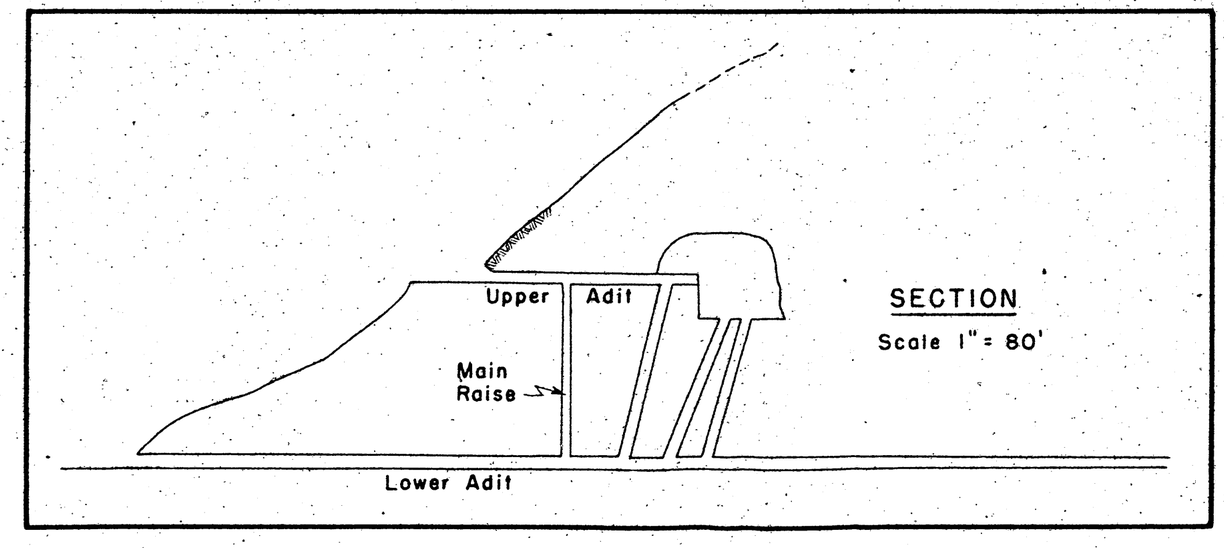
At the Tiptop mine, the limestone and quartzite dip steeply to the east and are in contact with granite at a shallow depth below the principal workings (fig. 2). A dark gray rock, tentatively identified as rhyolite, outcrops at the north end of the mine and at the Copper Duke mine where it also is exposed in the underground workings.

At the Copper Duke mine, the granite has been intruded by rhyolite (fig. 3). In the eastern portion of the mine a nearly horizontal fault cuts the granite and also forms a contact between the granite and the overlying rhyolite. The fault zone contains a thin section of limestone.



PLAN

Scale 1" = 40'



SECTION

Scale 1" = 80'

LEGEND

Ls	Limestone
Qtz	Quartzite
Gr	Granite
QM	Quartz Monzonite
	Upper Adit Workings
	Lower Adit Workings
	Workings From Winze
	Proposed Diamond Drill Holes

Traced from map furnished by applicant
Modifications by T.M. Romslo

FIG. 2
TIPTOP MINE
TIPTOP GROUP
OF MINES
PIMA COUNTY, ARIZ.
DMA 1019

ORE DEPOSITS

Tiptop Mine

The ore occurs in limestone near its contact with quartzite. It is associated with fractures and faults, and characteristically occurs as irregular pockets and bunches. Probably all but a few hundred tons of the ore produced from the mine has come from workings above the lower adit. In general, the upper portion of this zone contained carbonate ores and the lower portion yielded sulfide ore. In this zone the ores have been deposited on quartzite and on a floor of crushed limestone cut by a net-work of quartz stringers. The main ore bodies averaged about 6 percent copper. A few stringers of 10 to 25 percent copper ore, that go into the hanging wall, also were mined.

The lateral workings from the lower adit have been driven along quartz stringers, and along the stronger fractures in shattered and altered limestone. Ore mineralization is confined to veinlets of copper sulfides, ranging from a knife blade to an inch in thickness, that are present at widely scattered places. A little pyrite was noted in the limestone walls of the workings in widely scattered zones.

The examination indicates that the zone favorable to ore mineralization does not extend much beyond the present workings. At the north end of the mine and at a vertical depth of about 60 feet below the adit level the zone encountered barren granite. Conditions also are unfavorable for ore mineralization at the south end of the mine where the degree of alteration and fracturing of the limestone

is less extensive than in the productive zone of the mine.

Copper Duke Mine

The ore at the Copper Duke mine occurs in limestone, and also occurs in granite and rhyolite. All of the ore produced from the mine has come from the underground limestone deposits where it occurred as small lenses with a maximum thickness of probably not over 3 feet (fig. 3). The ore, as azurite, malachite, and a little chrysocolla, contained about 33 percent copper and a little silver. The ore zone dips gently to the west and passes below the workings at the first crosscut from the portal of the adit.

On the surface, the applicant has exposed a mineralized zone that he proposes to mine by open pit methods. There the ore occurs in a fractured zone of granite and rhyolite as blebs and discontinuous veinlets composed of azurite, malachite and a little chrysocolla. The zone has been exposed by a hillside cut and has been sampled by both the applicant and the Reconstruction Finance Corporation. Five samples taken by the applicant averaged 3.7 percent copper. Thirteen samples taken by the Corporation averaged 3.5 percent copper. The mineralized zone has a length of about 80 feet and an average height of about 4 feet.

The examination shows that mineralization in the sampled deposit is spotty and is confined to the most intensly fractured zones. Much of the intervening ground of the samples is essential barren of mineralization and a visual estimate indicates that the

average grade of the zone is less than 3 percent. That the deposit is not extensive is shown by an inspection of the underground workings. Mineralization in the crosscut that explores the deposits at a vertical depth of less than 10 feet is confined to small zones at widely scattered places. It also occurs similarily in the second set of crosscuts and at the granite-quartzite contact. The richer of the mineralized zones may contain as much as 3 percent copper.

ORE RESERVES

Tiptop Mine

The Tiptop mine contains no measured nor indicated ore reserves. It is possible that some ore may remain in the inaccessible portions of the upper workings but there are no data to indicate its presence. It also is possible that other pockets and bunches of ore may be found by following quartz stringers and fractures near the quartzite. However, there is little chance that any substantial tonnage of ore remains in the deposit because of the mode of occurrence, and because only a small part of the favorable zone remains to be explored.

Copper Duke Mine

Past operations have removed all the ore associated with limestone in the zone above the mine workings. It is possible that similar deposits may occur at lower horizons but such deposits would not constitute ore due to the mode of occurrence and their probable limited extent.

The measured and indicated reserves of the surface deposit consist of a few hundred tons of 3.0 to 3.8 percent copper ore. Inferred ore of similar grade may amount to several times the measured and indicated reserves.

PRESENT STATUS

General

The property is inactive. The owner stays on the property, except week-ends, in a 2-room shack that is the only structure.

Exploration

Tiptop Mine

The Tiptop mine is opened by 2 adits and is developed by more than 4,000 feet of underground workings (fig. 2). The workings are distributed principally on 2 levels, about 100 feet apart, vertically. A winze from the lower level is reported to have an inclined length of about 75 feet. A few hundred feet of workings were driven from the bottom of the winze. At present, water stands at the collar of this winze.

Probably all but a few hundred tons of the ore produced from the mine came from stopes above the lower adit level.

Copper Duke Mine

The underground workings of the Copper Duke mine consist of an adit, crosscuts, 2 short raises and 2 stopes (fig. 3). All of the workings except a large part of the stopes are accessible. The stopes from which 400 tons of ore have been produced probably have a maximum height (vein thickness) of about 4 feet.

The surface workings consist of a hillside cut that was sampled by the Reconstruction Finance Corporation in 1947.

Equipment

Mining equipment on the property is confined to an old hoist and skip at the winze of the Tiptop mine.

PROPOSED EXPLORATION AND EXPLOITATION PROGRAM

Exploration

The applicant proposes to drill 10 diamond drill holes on the property at an estimated cost of $10,000. Three of the holes would be drilled at the Copper Duke mine and the remainder would be drilled at the Tiptop mine. The locations from which the applicant proposed to drill the holes are shown on figures 2 and 3. He did not indicate to what depths the holes might be drilled.

Exploitation

The funds requested for this phase of the program would be utilized to purchase equipment and to provide working capital for the purpose of open-pit mining ore at the Copper Duke mine. A loan of $12,870 was requested for this project.

PROPOSED FINANCING

The applicant proposed to repay the loan out of profits from the sale of copper ore that would be produced from the Copper Duke mine. He submitted data showing that 3 percent copper ore would yield an estimated profit of $3.04 a ton. The profit is based on the following data, submitted by the applicant.

	Cost a ton*	
Grade of ore - 3 percent, value		$14.70
Mine and load on trucks	$ 1.00	
Trucking to railroad	2.00	
Freight to smelter	1.56	
Smelting cost	6.50	
Royalty	0.60	
Total cost	11.66	11.66
Net profit per ton before taxes		$ 3.04

* Based on production of 60 tons daily.

CONCLUSIONS

The Tiptop mine contains no measured nor indicated ore reserves. Furthermore, the following findings indicated that the possibilities of finding substantial ore reserves are unfavorable:

1. The ore, both oxides and sulfides of copper, occurred as pockets and bunches in limestone that were confined to a narrow zone near its contact with quartzite;
2. The ore occurred mainly above the lower adit and all of it is believed to have been removed by past mining operations;
3. Little or no ore was found by the lower workings that have rather thoroughly explored the favorable zone;
4. Field evidence indicates the zone favorable to ore deposition is not extensive and that all but a small portion of the zone has been explored by mine workings.

The copper deposits associated with limestone at the Copper Duke mine contain no measured nor indicated ore reserves. These deposits, as lenses of oxide ore, yielded a total of 400 tons from the zone above the adit level. It is possible that other deposits may occur

at lower horizons of the limestone bed but there are no criteria for determining their probable locations. Furthermore, there is no reason to believe that such deposits would be of sufficient extent to be minable under present conditions.

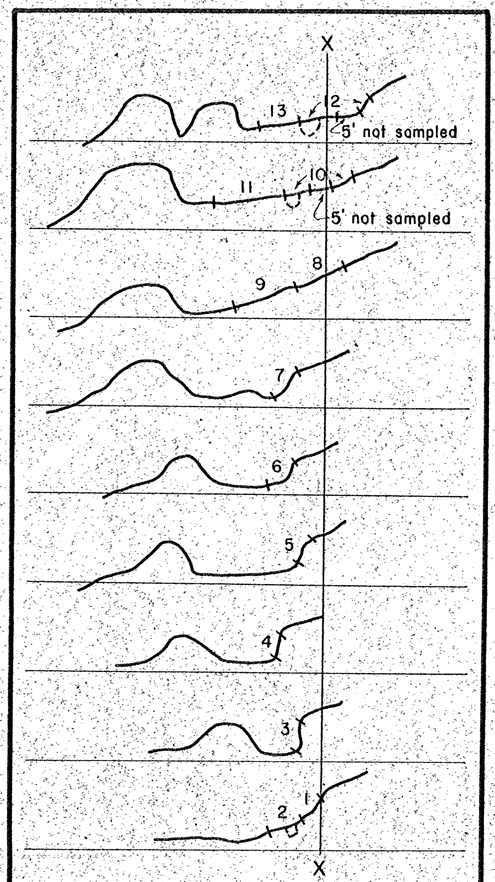
The measured and indicated reserves of the surface-exposed deposit at the Copper Duke mine amount to a few hundred tons of 3.0 to 3.5 percent copper ore. The deposit is cutoff at a depth of a few feet but may extend several tens of feet into the hillside. However, field evidence indicates that the inferred reserves, which may be several times the measured and indicated reserves, consist of lower grade material.

It also is concluded that ore of the grade exposed at the surface cannot be mined at a profit. Open-pit mining of the deposit might yield ore containing as high as 3 percent copper, as estimated by the applicant. Ore of this grade would have a smelter value of $10.75 a ton. Estimated costs a ton would be: $2.00 for mining, $2.00 for trucking, $2.31 for freight, and $4.50 smelting charges, or a total of $10.81. This indicates a loss of $0.06 a ton before royalty and taxes.

RECOMMENDATIONS

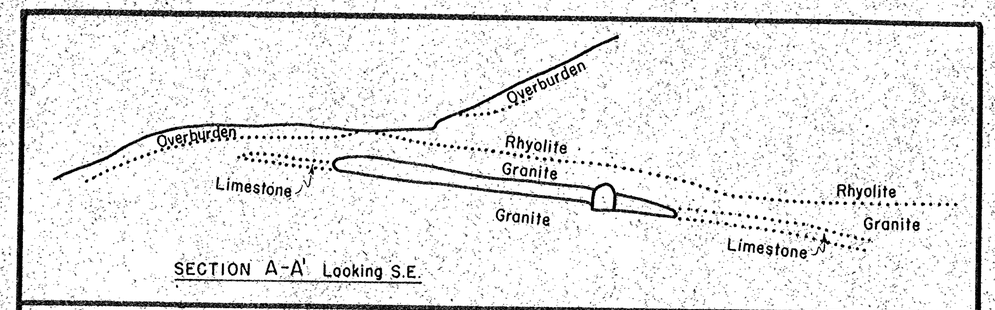
It is recommended that the applicant's request for an exploratory loan be denied because the chances of developing any ore at either the Tiptop or Copper Duke mine are unfavorable.

It also is recommended that the request for an exploitation loan be denied because the proposed operation cannot be conducted at a profit.

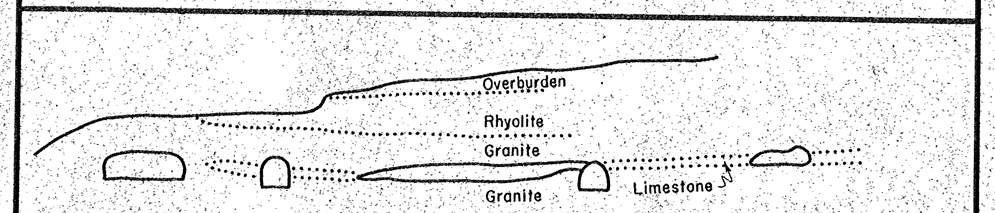


SAMPLE SECTIONS
Looking S.E.

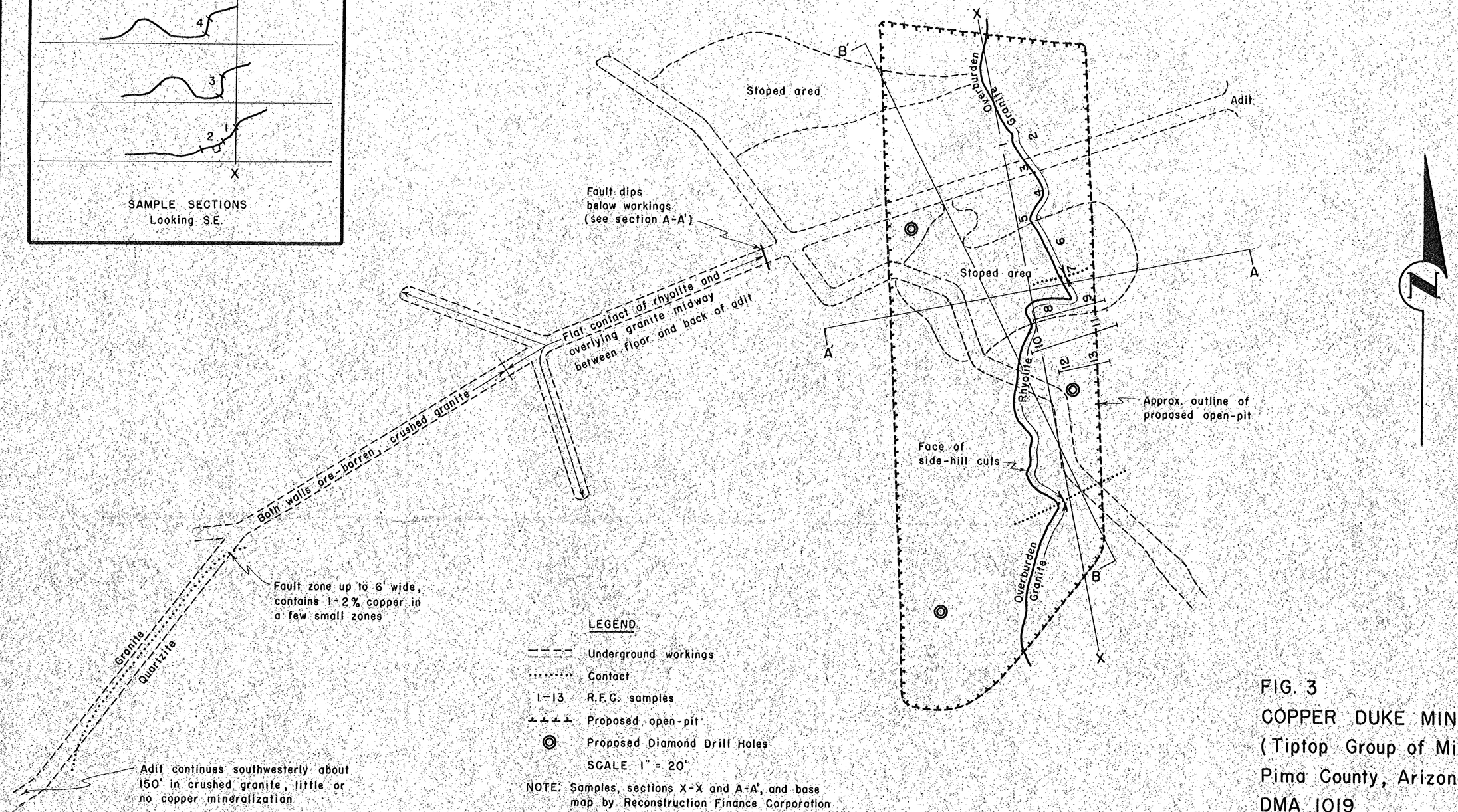
SAMPLE NUMBER	INTERVAL FEET	PERCENT COPPER
1	7	2.25
2	7	2.10
3	6	2.90
4	5	3.60
5	5	4.95
6	8	6.60
7	7	1.70
8	12	4.10
9	9	3.00
10	10	5.30
11	15	3.40
12	12	6.30
13	9	1.40



SECTION A-A' Looking S.E.



SECTION B-B' Looking S.W.



LEGEND

- Underground workings
- Contact
- 1–13 R.F.C. samples
- Proposed open-pit
- Proposed Diamond Drill Holes
- SCALE 1" = 20'

NOTE: Samples, sections X-X and A-A', and base map by Reconstruction Finance Corporation

FIG. 3
COPPER DUKE MINE
(Tiptop Group of Mines)
Pima County, Arizona
DMA 1019